

**IMPROVEMENT PROGRAM FOR THE VENTILLA-TARAPAYA HIGHWAY
AND TRANSPORTATION SECTOR SUPPORT****BO-0098****EXECUTIVE SUMMARY**

Borrower:	Republic of Bolivia	
Executing agency:	National Road Administration (SNC)	
Amount and source:	Bank: Fund for Special Operations (FSO)	US\$52.0 million
	Nordic Development Fund (NDF) (SDR)	US\$ 6.8 million
	Local:	<u>US\$13.0 million</u>
	Total:	US\$71.8 million
Terms and conditions:	Amortization period:	40 years
	Grace period:	10 years
	Execution:	4 years
	Disbursement:	4.5 years
	Interest rate:	1% for 10 years; 2% for 30 years
	Supervision and inspection:	1%
Objectives:	Credit fee:	0.50%
	<p>The general objective of the proposed program is to help improve the competitiveness of the country's productive sectors, in the context of growing domestic and international trade, by enhancing the level of service on the basic highway system, and reducing costs for users.</p> <p>The program's specific objectives are to upgrade the characteristics and structural capacity of the Ventilla-Tarapaya-Potosí section, by undertaking roadway improvements, paving and rehabilitation, and increasing the usability of its access roads, in accordance with proper safety standards. The program will also introduce more efficient management methods for maintaining the system and measures for institutional strengthening to increase sector efficiency.</p>	

Description:	<p>The program consists of upgrading and paving the Ventilla-Tarapaya stretch (US\$31.5 million), rehabilitating the Tarapaya-Potosí stretch (US\$1.7 million), and improving access roads to communities in the immediate area of influence of the Ventilla-Tarapaya-Potosí stretch (US\$2.6 million). It also includes support for the transportation sector through institutional strengthening (US\$5.65 million), including training for personnel of the SNC and the Office of the Deputy Ministry for Transportation, Communications, and Civil Aviation (VMTCAC), and the purchase of equipment and installation of computer systems (US\$5.2 million)</p> <p>It also includes funding for engineering and administration (US\$6.4 million), periodic maintenance of the basic system (US\$5.5 million), the purchase of land for weigh stations, rights-of-way, and relocation (US\$700,000), repayment of the PPF (US\$1.5 million), contingencies and escalation (US\$6 million), and finance charges (US\$2.5 million).</p> <p>With Bank support, the Bolivian authorities have arranged parallel funding from the Nordic Development Fund (NDF) for 5 million Special Drawing Rights, or US\$6.8 million equivalent, for the procurement of equipment, training, and institutional strengthening (paragraphs 1.22, 1.28, 2.17, 2.18, 2.23, and 2.29).</p>
Project consistency with Bank's country and sector strategy:	<p>The Bank's strategy for Bolivia stresses efforts to reduce poverty. Improving the Ventilla-Tarapaya highway and its feeder roads will help to create opportunities for economic growth and temporary employment during execution of the works in areas with high poverty rates. It will also improve access for the local population to basic social services by improving transportation facilities and reducing travel time. The institutional strengthening component will help to better organize the subsector and therefore its governance.</p>
Environmental and social review:	<p>The direct negative environmental impact of the works, particularly during the construction stage, is expected to be of low intensity, localized, predictable, and readily mitigated. The impact of the works on the region's socioeconomic situation will be essentially positive, and measures are planned to mitigate and compensate for any inconvenience suffered by inhabitants of dwellings or users of public spaces that will have to be relocated (approximately 211), either because they were constructed within the right-of-way of the existing highway, or to make way for minor roadway realignments (paragraphs 3.17 to 3.20).</p>

Benefits: The major benefits of the project will lower vehicle operating costs for the users of the roads. The inhabitants of the area of influence will also benefit from an increased supply of transportation and the likely reduction of freight and passenger charges, greater frequency of service, and reduced travel time to social service centers.

With better maintenance and passability throughout the basic system, rational and efficient distribution of maintenance resources, and the introduction of vehicle weight controls to avoid premature deterioration of pavements, the costs of maintaining the highways will be reduced, as will transportation costs.

Risks: As a result of the institutional instability that the SMC has been experiencing over the last four years, it has lost much of its most qualified professional and technical personnel, and has been unable to replace them because of the low salary levels it still offers. The introduction and sustainability of sector planning and road administration systems and a system of weight control will depend on the availability of qualified personnel, appropriate allocation of resources for operating those systems and keeping them up-to-date, and the support of the authorities in ensuring that the regulations and recommendations resulting from their use are observed by road users and the general public. In the short term, these deficiencies will be overcome through advisory services, training and consulting services provided through the PPF and the loan. In the medium term, additional consultants and technical personnel will be hired, financed partially with external resources. However, both the VMTCAC and the SNC will have to find the means to improve salary levels and to hire permanent professional and technical staff in order to ensure the continuity of those efforts, and financial sources will have to be secured for this purpose. As a condition of the first disbursement, the borrower will submit a staffing reinforcement plan (paragraph 3.12), which will be monitored and updated during the periodic program review meetings.

Through toll collections, the SNC has been able to secure funds sufficient to meet 60% of the estimated annual budget for maintaining the basic highway system during the period from 1999 to 2001. The difference is to be made up through contributions from the TGN, but given the lack of budget resources available there is a considerable risk that this will not be achieved, and the goal of comprehensive upgrading for the basic highway system could therefore be compromised. Accordingly, for the first few

years of the program, arrangements have been made for the Bank to provide funding for periodic maintenance, and for the World Bank to finance routine periodic maintenance, which will bring maintenance coverage to approximately 80% on average (paragraph 3.14). Nonetheless, the government will still need to find a way to secure permanent sources of funding to ensure sustainable road maintenance. The program includes resources to hire consulting services and support the identification and formulation of mechanisms to establish permanent sources of funding for road maintenance. Consequently, it has been agreed that the borrower will submit its plan for sustainable financing for road maintenance to the Bank within 18 months after signature of the loan contract.

All the concession projects for roadway upgrading, expansion, rehabilitation, and/or reconstruction, which involve the stretches with the greatest toll revenue-producing potential, must be carefully analyzed, particularly with respect to their impact on reducing SNC revenues, which are the primary source of funding for maintenance throughout the basic system. The concession plans will also be part of the annual operating plans (AOPs) and will be discussed at the periodic meetings (paragraph 3.23).

Special Contractual
Conditions:

Conditions precedent to the first disbursement:

- a. The weight control stations included in the Short-Term Plan must be installed and operational (paragraph 1.24).
- b. Evidence must be submitted that the 1999 Maintenance Plan has been funded and is being implemented (paragraph 3.14).
- c. The Master Transportation Plan must be implemented (paragraph 1.19).
- d. The Project Coordination Unit (PCU) for coordination of projects with international organizations must be established and operational (paragraphs 2.8 and 3.2).
- e. The Program for personnel reinforcement and training must be approved (paragraph 2.22 and 5.31).
- f. The annual operating plan (AOP) for year one of the program must be approved (paragraph 3.23).
- g. The agreements with the departmental governments of Oruro and Potosí for local support to the works (paragraph 5.8),

improvements in access roads (paragraph 3.25), and implementation of the Compensation and Resettlement Plan (PRIPA) must be negotiated and signed by the respective parties (paragraph 3.17).

Other conditions:

1. The project financial statements must be audited by an independent firm of public accountants (paragraph 4.9).
2. Additional Audit Department staff must be hired, as agreed upon with the Bank (paragraph 4.9).
3. Periodic reviews of the AOPs must be carried out during program execution, and any measures agreed upon must be taken (paragraph 3.23).
4. Annual maintenance report must be submitted beginning in the year 2000, throughout the program execution period (paragraphs 3.13 and 3.23).
5. The budget allocations for periodic and routine maintenance of the basic system must be provided throughout the life of the proposed loan, according to the plan, and as agreed at the AOP review meetings (paragraphs 1.23 and 3.14).
6. A Plan for Sustainable Financing of Road Maintenance must be prepared and submitted to the Bank within 24 months after signature of the contract (paragraph 5.32).
7. The SNC Environmental Unit must certify that the environmental and social protection measures called for under the respective contracts have been duly implemented, before authorizing the release of funding for the works.
8. Bolivia must agree to ensure that the legal provisions remain in force requiring the central government to set aside annual transfers to departmental governments to cover local counterpart funding for the road works to be carried out under the program (paragraph 5.8).
9. A revolving fund must be established equivalent to 5% of the loan amount (paragraph 3.30).
10. Up to US\$1 million in previous expenditures may be recognized as part of the proposed loan and up to US\$500,000

as part of the local counterpart funding (paragraph 3.32).

11. Before a call for bids on works can be issued, evidence must be submitted that: (i) the bidding documents include environmental protection measures, and (ii) the necessary environmental permits and licenses have been obtained. If the works involve relocation or resettlement, the PRIPA must be complied with before construction begins.

Poverty-targeting and social sector classification:

The project is located in a region with a poverty rate above the average for the country. Since the project will benefit most of the population in that area, according to the Report on the Eighth General Increase in Resources (AB-1704), it qualifies as a geographically poverty-targeted investment and is therefore part of a key area of Bank activity for social equity and poverty reduction (paragraphs 5.22 and 5.23).

Exceptions to Bank Policy:

As indicated in the following section on procurement, the works to upgrade community access roads will be carried out by the Departmental Road Administrations (SDCs) of the departments of Potosí and Oruro through direct contracting (paragraph 3.25).

Procurement:

Procurement will be carried out in accordance with normal Bank procedures. Construction contracts for amounts exceeding US\$3 million will be awarded through international competitive bidding (ICB) in accordance with Bank rules. The works on the Ventilla-Tarapaya stretch will be divided into two sections and will be subject to prequalification, using the two-envelope procedure with deferred opening.

All consulting contracts for amounts of more than US\$200,000 will be awarded through international calls for proposals (ICP), and procurement of goods for amounts greater than US\$350,000 will follow the Bank's normal ICB procedures (paragraphs 3.24 and 3.26).

Procurement in amounts below these thresholds will be carried out according to the procedures established in national legislation.

Improvement works on community access roads will be carried out by the departmental governments of Potosí and Oruro through direct contracting under agreements to be signed with the SNC. The total amount of the works to be executed under these agreements may not exceed the equivalent of US\$2.6 million (paragraph 3.25).

I. FRAME OF REFERENCE

A. Socioeconomic context

- 1.1 In 1985, Bolivia launched a process of structural reforms that succeeded in re-establishing macroeconomic stability and promoting moderate growth, which over the last five years has been maintained at an average rate of 3.7%. Inflation was drastically reduced by the initial economic adjustment measures of the last decade, and has continued on a downward trend, thanks to an appropriate combination of conservative monetary and credit policies, a stable exchange rate, and measures to reduce fiscal spending. In 1997, inflation stood at 6.7%, down from the 8% recorded in 1996 and the average of 9.8% for the period 1992-1996.
- 1.2 Nevertheless, although Bolivia is regarded as one of the most advanced countries in terms of implementing reforms and opening up its economy, its growth rates are still not high enough to support rapid development. Its GDP continues to be the lowest in South America (and lower than that of other countries in the region that are smaller in area and have less diverse resources), its export volumes have not increased significantly, and the gap in its balance of payments has widened.
- 1.3 It is clear, then, that Bolivia's economic and social development cannot rely solely on the reforms to date, and that other adverse factors must be addressed, pertaining to inequality and a lack of connections in the distribution of the population, a lack of diversity in the country's economic base and limited access to financing sources, the inadequacy of its physical infrastructure to provide effective support for agricultural, industrial, and commercial development, and the difficulties of a land-locked country in gaining access to international markets.

B. The transportation sector

- 1.4 Transportation is an essential element for supporting vigorous growth of all economic activities in developing countries. In the case of Bolivia, it is also of fundamental importance in the process of national and regional integration, and is essential for giving its people access to sources of employment and social services that will help them improve their standard of living. Bolivia's transportation system is quite underdeveloped, existing infrastructure is inadequate and its maintenance is deficient, and the road transportation fleet requires modernization. Moreover, there is little coordination or complementarity among the various modes of transportation in use, leading to poor levels of service, high transportation costs, and excessive travel times, which are reflected in the high cost of marketing local products, placing them in many cases beyond the reach of the average consumer in domestic markets and making them uncompetitive on international markets.

1. Bolivia's transportation infrastructure

- 1.5 The rail system consists of approximately 3,700 kilometers of narrow-gauge railway (longer than the paved road system) divided into two subsystems, the Andean and the eastern, which are not interconnected. In 1996, the systems were transferred to private operators. Water transportation moves less than 5% of the

country's freight traffic: It relies on four large river systems: three are part of the Amazon basin and the other is part of the River Plate basin. River infrastructure is highly precarious and the volumes carried by this means are very low, limited for the most part to local trade among riparian communities. The country's major airports, through which more than 80% of airborne passenger and freight traffic moves, are those at La Paz and Santa Cruz, for domestic and international operations, and at Cochabamba, which handles only domestic air traffic.

- 1.6 The road transportation system consists of approximately 52,200 kilometers of roads, of which 10,400 kilometers are part of the basic or national highway system¹, 6000 kilometers belong to the secondary or departmental system, and 35,800 kilometers to the local system. The highway system is used to carry nearly 90% of freight and 95% of passenger traffic in the country. However, it is one of the least developed systems in the hemisphere: while most countries in the region have a road density (kilometers of road per square kilometer of land area) varying between 0.08 km/km² and 0.40 km/km², Bolivia's is only 0.04 km/km². This situation is compounded by the fact that only 6% of the Bolivian road system is paved, and a large portion of the remaining roads are in a poor state of repair and are impassable at certain times of the year. Many parts of the country are thus virtually cut off from the rest, and other areas are difficult or impossible to reach, especially during the rainy season.

2. The basic highway system

- 1.7 The 10,400-kilometer basic highway system is made up of: (i) two trunk roads crossing the country from north to south and from east to west, and intersecting in the city of La Paz (besides linking the country's largest cities, they link Bolivia with Argentina, Brazil, Chile, and Peru); (ii) four highways linking the capitals of the nine departments with the main highways and providing access to areas with major development potential; and (iii) five secondary roads that branch off from the trunk highways in the direction of other points on the borders with Argentina, Brazil, Chile, and Paraguay, and that are expected to carry significant commercial and tourist traffic in the future. Only 3,000 kilometers of this system (roughly 30% of the total) are paved, and there is not a single international corridor that is completely and continuously paved, except for one that links La Paz with northern Chile. A large part of the system is in need of major investments to upgrade it and stabilize its surface so as to make it passable year-round. These improvements are gradually being made, with the close cooperation of the Bank, the World Bank, the Andean Development Corporation (ADC), and other international organizations, but a major effort is still required to bring the entire system up to acceptable operating standards, given that it carries more than 85% of the commodities and merchandise transported in the country.
- 1.8 The proposed program will lend continuity to the support that the Bank has been providing the Bolivian government to consolidate and improve the level of service on the basic highway system. Paving of the Ventilla-Tarapaya stretch will complete the paved highway link between La Paz, Oruro, and Potosí, and raise it to

¹ As defined recently by Supreme Decree 25,134 of August 31, 1998.

international traffic standards. The financing to be provided as part of the program for periodic maintenance, institutional strengthening, and organization of the highway subsector, will lay the groundwork for greater efficiency in the comprehensive maintenance of the entire system and will improve the level of service on the basic system, according to the goals set forth below (paragraphs 3.13 to 3.16).

C. Current problems in the road subsector

- 1.9 The National Road Administration (SNC) has historically been the institution responsible for planning, construction, administration, and maintenance of Bolivia's road system. Accordingly, it has consistently been the channel through which the Bank and other multilateral institutions have provided their support for expanding and improving the level of service in the system, along with efforts to strengthen its technical and administrative capacity and to introduce systems for planning, resource allocation, and administration of road maintenance in order to ensure the efficiency and durability of the investments.
- 1.10 Pursuant to Law 1654 of July 28, 1995, a process of administrative decentralization of the Executive Branch was undertaken. This move included decentralization of the road subsector, with the transfer of responsibilities for construction and maintenance of highways and secondary roads to the departmental governments, and dismantling of the SNC. Unfortunately, this measure failed to take into account the fact that, if the basic system was to continue to meet domestic needs and eventually service international transportation, it would have to remain under the administration of a central body so that extensions and improvements could be planned according to national criteria, with appropriate and uniform standards, which would be very difficult to achieve if system administration were fragmented.
- 1.11 By 1996, the lack of coordination among departmental agencies, their lack of experience in managing the systems that were just beginning to function in the SNC, and their limited technical resources and divergent criteria for investment allocation, focusing primarily on local concerns, were reflected in a considerable deterioration in the state of repair of the country's major highways, in a virtual paralysis of the basic data collection systems essential for transportation planning, and in difficulties in exercising effective control over vehicle weights. Moreover, the use of highway toll revenues, which were now being collected by departmental agencies, could no longer be controlled, and problems in the administration of operations with external financing arose, particularly in the implementation of institutional strengthening components that were originally designed for the SNC.
- 1.12 At the urging of the IDB, the World Bank, and other international organizations, which would lose their primary interlocutor if the SNC were dismantled, the government decided to defer this step and began to consider the possibility of recentralizing the basic system. During project preparation, the Bank pointed to the need for reform measures as a condition for its continued participation in financing the sector. The purpose of the reforms would be to: (i) establish an organizational plan for the sector that would define the role of the SNC and govern the financing of operations under its responsibility; (ii) adopt a policy for sustainable, ongoing

maintenance, with a clear definition of private-sector participation; (iii) introduce a vehicle weight control system; and (iv) complete a Master Transportation Plan with duly prioritized actions.

D. Restructuring the transportation sector

1. Redefining the jurisdiction and new functions of the SNC

- 1.13 Given this situation, after lengthy deliberations on August 21, 1998, the national government issued Supreme Decree 25134 on the "National Highway System", setting forth the respective jurisdictions and responsibilities of the various agencies responsible for planning, administration, and maintenance of the country's highway infrastructure. This decree also identifies the highways that are part of the basic system and that will remain under the responsibility of the SNC. It assigns responsibility for departmental system management to the departments, through the Departmental Road Administrations (SDCs), and responsibility for local road maintenance to the respective municipalities. The SNC will remain the regulatory and supervisory body for all road projects of national scope, and will once again be responsible for the collection of highway tolls and the enforcement of vehicle weight controls.
- 1.14 The decree also provides that the SNC will keep 70% of all toll collections for maintenance of the basic system, and will transfer the remaining 30% to the SDCs exclusively for maintaining and upgrading their respective departmental systems. The funds retained by the SNC will be deposited in a special national account for road maintenance, to be administered by the SNC, and must be used exclusively to pay for contracts with third parties for road maintenance works and services. Should the toll revenues retained by the SNC fall short of the amounts necessary for full coverage of maintenance needs for the basic system, the National Treasury (TGN) will supplement them with budgetary allocations to ensure that sufficient funds are available to meet the objectives of achieving proper maintenance of the system. The personnel and operating expenses of the SNC will be covered with TGN resources, according to the volumes of work it undertakes each year and the responsibilities that are assigned to it. Any emergency maintenance requirements will also be covered through special transfers from the TGN to the SNC.
- 1.15 The government decided that maintenance and conservation of the basic system should be outsourced, beginning in 1999. Consequently, the SNC has begun to adjust its organizational structure and is preparing and training technical and administrative staff so that they can carry out their new functions. The new structure of the SNC has been formalized, and the Bank has approved funding from the Project Preparation Facility (paragraph 1.39) to support the restructuring. Consultants will be hired to develop organizational and operating manuals and to begin the training process, so that the basic organization and key personnel are in place before the proposed operation is implemented. Moreover, as part of the institutional strengthening component of the proposed loan, resources will be provided to support consolidation of the new organization at all levels.

2. Assigning responsibilities for sector planning

- 1.16 To achieve a rational structure for the sector and provide guidance in setting investment priorities, it will also be necessary to strengthen sector planning, to assign responsibilities for the subsector planning bodies, and to establish links for ongoing communication and the exchange of information. Accordingly, the VMTAC decided to establish the National Transportation Sector Planning Office (ONPST) in its organizational structure, by integrating the current Master Transportation Plan Office and the Planning Unit of the Department of Transportation.
- 1.17 The specific functions of the ONPST will be the following: (i) coordination within and outside of the sector to collect and disseminate the information needed for guidance and planning of the sector at the macro level; (ii) regular updating of the Master Transportation Plan in light of national development objectives and policies; (iii) introduction and operation of the Geographic Information System (GIS); (iv) providing information the subsectors may need to prepare specific projects; (v) compiling and consolidating the information produced by the subsectors on all their activities; and (vi) producing and disseminating annual reports or periodic bulletins with sector statistics.
- 1.18 The ONPST will in due course be responsible for: (i) preparing the General Transportation Plan; (ii) supervising the Highway Concession Study and implementing recommendations and specific activities that emerge from that study; and (iii) supervising the existing contract for preparation of the Master Transportation Plan until its final delivery.

3. Status of preparation of the Master Transportation Plan

- 1.19 The Master Transportation Plan is now being prepared with Bank support. It will quantify overall investment and maintenance needs for the basic system over the medium and long terms, so that priorities can be set and a program prepared to guide investments in the road subsector. There have been considerable delays in preparing the plan, primarily at the stage when a consortium of consulting firms was to be hired to develop it, and also because counterpart personnel were not assigned on a timely basis. In October 1998, the Bank received a draft of the final report. Although it identified the most urgent priorities (including the Ventilla-Tarapaya project), the report was found to have a number of shortcomings, including a limited focus with respect to the dynamics of development of the productive sectors and international traffic. A working team made up of personnel from the consortium and from ONPST has therefore been set up to review and edit the final version of the plan, and is expected to conclude its work in the first half of 1999. Implementation of the Master Transportation Plan will be a condition precedent to the first disbursement of the proposed new Bank loan.

E. State of repair of the basic system and road maintenance activities

- 1.20 In June 1998, the SNC conducted a survey to assess the state of repair of the highway system maintenance, which was to become its responsibility as of January 1999. The survey covered a total of 9,020 kilometers and revealed that 35% was in

poor or very poor condition, 45% in fair condition, and 20% in good or excellent condition. On the basis of these findings, a maintenance plan for 1999-2001 was drawn up (see Table 3.1), with a total cost of approximately US\$70 million, based on the guidelines in the maintenance management system (SAM). It includes routine maintenance, periodic maintenance, emergency works, and minor repairs. The plan, together with its financing scheme (which includes possible contributions from the proposed loan) was submitted to the Bank in January 1999, and is considered to be technically consistent and reasonable in light of existing budgetary constraints (paragraph 3.14).

- 1.21 The routine maintenance activities called for under the plan will be executed by means of contracts with private firms, for which the bidding process is now under way, covering 39 packages totaling approximately 8,300 kilometers. The contracts will run for three years on a unit-price basis, which means that the SNC must have an adequate complement of supervisors in order to ensure ongoing monitoring of the activities carried out. Calls for bids for the periodic maintenance work, to be financed partially with resources from the proposed Bank loan and other loans from the World Bank, will be issued separately, according to the timetables established in each case.
- 1.22 The results of the first round of bidding for routine maintenance work were rather discouraging: few firms participated, and they had little experience with this type of contract. Consequently, the SNC has stepped up its publicity campaign, inviting potential bidders to information sessions in the hope that the next round of bidding, expected to be completed by the end of March 1999, will produce better results. In the event that there is no increase in private-sector interest in the maintenance contracts and that no effective competition can thus be ensured, as a fallback the SNC may award the contract to a single bidder, provided the price is within established limits. It also has the option of entering into agreements with Departmental Road Administrations (SDCs) to carry out maintenance work on stretches or sections of the system for which no contractors can be found. Such agreements will in general be based on terms and conditions similar to those established in contracts with private firms. A personnel training program is therefore also to be carried out for the SDCs, with the financing from the NDF (see also paragraphs 2.17, 2.18, and 2.33).
- 1.23 The sustainability of road maintenance at levels that will guarantee an adequate level of service for the basic system on an ongoing basis will depend on the SNC's ability to find permanent sources of financing to cover the shortfall between highway toll revenues and actual maintenance needs once international financial support is not being provided. Accordingly, the loan contract will include a commitment on the part of the government to provide budget allocations for periodic and routine maintenance of the basic system, as agreed upon at the periodic project monitoring meetings between the Ministry of Finance and transportation sector authorities. At the same time, the proposed program will include resources to support studies and specific activities designed to secure permanent sources of funds.

1. Instituting the vehicle weight control program

- 1.24 Overweight vehicle traffic is one of the most serious factors affecting the useful life of road surfaces in Bolivia. The Bank has thus in previous operations supported the purchase of weigh scales and the installation of weight control stations along some of the country's major highways. Despite the progress achieved with the approval of the vehicle loading law and its respective regulations in 1997, there has been no follow-up in terms of establishing an effective control system. Efforts to date, involving primarily the use of mobile weigh scales, have been unsuccessful, in part because this responsibility was transferred to the departmental governments, which have little experience in handling this type of equipment. A more fundamental problem, however, has been the continued objection of the truckers' union and its resistance to enforcement of provisions needed to make this control effective. Now that responsibility for weight control has been returned to the SNC, the latter has created a series of technical and operational units for the weight control system and, with consulting services funded by the PPF, has been preparing a short-term plan to equip and operate the highest-volume control stations. The plan calls for the installation of 10 stations. This will involve: (i) making use of some of the existing installations and equipment, reconditioning and repairing previously used weigh scales, or using eight new scales to be purchased with resources from previous Bank loans; (ii) entering into agreements with other agencies, such as the Customs Administration, that have weigh stations at border crossing points; and (iii) constructing small concrete platforms that can be quickly and economically built at strategic locations and that can be used for random controls with mobile scales. All of these facilities are expected to be in operation by May 1999. This will in any case be a condition precedent to the first disbursement. At the same time, work is under way on an awareness campaign targeting carriers and freight dispatchers to demonstrate to them the damage that overweight traffic causes to the roadways and the benefits of keeping the highways in good condition, as well as to advise them of the penalties that will be imposed on violators.
- 1.25 With the support of consultants, the SNC is also drawing up a medium-term plan, which will include an integrated weight control system covering the entire basic system and to be implemented during execution of the proposed program. The consultants have prepared a preliminary estimate of the resources needed to implement the medium-term plan, which was used to determine the scale of the component for inclusion in the program (paragraph 2.17).

2. Toll collection

- 1.26 As explained in paragraph 1.14, 70% of toll collections at the national level will be used to finance maintenance of the basic system. Although audited and consolidated financial statements for recent years are not yet available, these revenues are expected to amount to some US\$20 million per year, of which US\$14 million would go to the SNC. It is therefore crucial that the SNC establish a reliable system to ensure that these revenues are generated, given that they are expected to cover about 60% of annual financing needs for road maintenance (according to the plan for 1999-2001; see Table 3.1 and paragraph 3.14).

- 1.27 During the period when the departmental governments were in charge of toll collection and administration (1996-1998), various methods were used to collect fees from road users. The departments of La Paz, Cochabamba, and Santa Cruz entered into contracts with private companies for toll collection, since the highways in their jurisdictions had sufficient volumes of traffic to justify such a system. These private contracts generally produced good results, reducing evasion and increasing toll revenues. By contrast, performance at those control stations that were operated on force account by other departments varied greatly, and in fact some of them produced virtually no revenue at all.
- 1.28 Now that administration of the basic highway system is again being consolidated, the SNC is assessing various options for introducing a new and more sophisticated, nationally integrated system that could maintain strict control over daily toll collections. Among the options being considered are the following: a single concession for the entire system, a series of separate contracts for system operation, and/or force account. The investments required to install the toll booths and to equip and assemble an integrated control system, as well as to cover its operating costs, could be amortized with resources from higher toll collections, reduced evasion, and the elimination of fraud. An increase in tolls may also have to be considered, once it can be demonstrated that there is a clear improvement in the state of repair of the system. While these issues are under study, the SNC has moved to endorse the contracts entered into by the departments and to assign or contract the personnel necessary to cover operation of toll collection stations that were not previously contracted out. The NDF loan would also be used to improve toll collections, through the purchase of equipment and electronic devices that will ensure more effective control of toll collections (paragraph 2.18).

3. Private investment prospects in road infrastructure

- 1.29 Through operation ATN/MT-5511-BO, the Bank is supporting a study to identify private investment opportunities and to prepare a road concession system that could help to broaden the options for financing the upgrading, rehabilitation, and expansion of the basic highway system. In late 1998, the national government approved a Concession Act and regulations, thus establishing the necessary framework for encouraging private-sector participation. Nevertheless, according to the consultants who have examined the potential for concessions in Bolivia, it is not likely that maintenance concessions can be granted for a significant portion of the system (maximum 10-15%), if financing for them is to be based exclusively on toll collections.
- 1.30 At the moment, the VMTCAC is working to identify potential concession projects and has received expressions of interest from the private sector, in the form of concrete initiatives for upgrading certain stretches of the basic system that carry large volumes of traffic or that have good potential for growth in the medium term (paragraph 4.12). Funding from the PPF has been earmarked to hire experts in concession contracts to work with the Bolivian authorities in analyzing these initiatives and to identify their potential impact on the collection of toll revenues for comprehensive maintenance of the basic system.

F. Bank experience in the sector

- 1.31 The Bank has financed 14 projects in the transportation sector, totaling US\$582.6 million. The most recent loan was approved in 1992. The Bank's efforts have been designed primarily to support expansion and upgrading of the country's principal highway system, and to strengthen its capacity to administer and maintain that system.
- 1.32 In general, most of these operations have been executed in a satisfactory manner, although in nearly all cases the disbursement periods had to be extended. Currently, two of Bank-financed operations are encountering execution difficulties. One of these is for the Beni-La Paz-Peruvian border corridor (under loans 698/OC-BO for US\$55 million and 893/SF-BO for US\$40 million), which consists of two sections: (i) Cotapata-Santa Barbara and (ii) Río Seco-Desaguadero. In the first section, the contract consortium has received complaints from the contractors about late payment of local counterpart contributions by the departments and cost overruns due to delays in resolving certain problems that were not foreseen in the original design. Among these was the construction of a tunnel of some 1,300 meters in length, the designs for which took almost two years to be completed. The designs were delivered to the contractors, who were to submit price bids by the end of February 1999. If the consortium does not submit a bid for construction of the tunnel, or if that offer is deemed unreasonable, a separate call for bids will have to be issued for the tunnel construction works, which could lead to further delays in completing the entire project. As for the Río Seco-Desaguadero section, the SNC has entered into a supplementary agreement with the contracting firm to cover cost overruns in construction of the Río Seco-Guaqui section, incurred because archeological sites were discovered during construction and the original alignment in the area of Tiahuanaku had to be rerouted to preserve them.
- 1.33 The other operation that has encountered problems is the one for upgrading the Cochabamba-Chimoré and Yapacaní-Guabirá sections, financed under loan 527/OC-BO. These works were finally completed in late 1996, after it was decided to leave 28 kilometers unpaved in the area known as "El Sillar", where there were still unresolved embankment stability problems. Since the resources of this loan were fully used, the SNC has requested that funds be included in the proposed operation to cover studies on a definitive solution to the problems in that section.
- 1.34 Most of the administration problems with the Bank's transportation sector portfolio in Bolivia have been due essentially to the lack of expeditious mechanisms to resolve problems arising during project execution on a timely basis; inadequate coordination among the entities involved in procedures for procurement and the hiring of consultants to conduct studies; and the lack of a clearly defined institutional structure. The proposed program will support the introduction of major institutional changes and the use of modern management systems that should eliminate these shortcomings or considerably reduce them.

G. Participation by other multilateral institutions in sector financing

- 1.35 The World Bank has also played an important role in supporting development of Bolivia's highway system and in providing institutional strengthening for the

agencies responsible for the transportation sector. It should be noted that the IDB and World Bank have worked together in close coordination to persuade the Bolivian government of the benefits of keeping a centralized administration for the basic system (paragraph 1.14) and restructuring the SNC into a regulatory and supervisory agency, the most important immediate goal of which should be to improve the state of repair of the roads that make up the basic system and to establish mechanisms to ensure proper maintenance of the system on an ongoing basis.

- 1.36 The World Bank's most recent loan, which is still in execution, is the second highway maintenance project (2395-BO for US\$58.5 million). It includes rehabilitation of 780 kilometers of paved highways and 765 kilometers of gravel roads, as well as repair or rehabilitation of 77 bridges. A portion of the undisbursed balance is earmarked for periodic or routine maintenance to help the SNC meet the goals of the 1999-2001 maintenance plan. The World Bank also has another loan in preparation, expected to be approved in the first half of 1999, that would finance upgrading and paving of the Abapó-Camiri highway (BO-PE-55230 for US\$70 million). This operation will include US\$13.5 million for road maintenance, which will also help to reduce the financing gap for the maintenance plan (paragraph 3.14).
- 1.37 The Andean Development Corporation (ADC) has participated in a number of operations cofinanced with the IDB, such as the Beni-La Paz-Peruvian border corridor, and in other joint operations with the World Bank.

H. Country strategy for the transportation sector

- 1.38 In accordance with the general policies of the government, the strategy for the transportation sector is to ensure the provision of suitable infrastructure to enhance the potential for market participation. The purpose of the strategy is therefore to: (i) establish an institutional and regulatory framework for the sector, embracing all of the subsectors; (ii) provide a clear, long-term strategy to guide future investments in the sector; (iii) ensure proper oversight and regulation of the use of the country's highways; and (iv) complete domestic road connections in the country and provide road links with neighboring countries for connection with the three main watersheds, thereby supporting export development.

I. Project Preparation Facility (PPF)

- 1.39 Given the difficult situation in the sector in recent years and the weakness of the SNC's institutional structure, as part of project preparation for the proposed operation, the Bank approved on January 22, 1999 a US\$1.5 million PPF (1030/SF-BO, to be repaid with the first disbursement under the loan). It will be used to hire consultants and to equip certain units of the SNC and the VMTCAC, in order to enhance their operational capacity, provide them with the necessary specialized advisory services, and ensure fulfillment of the conditions for eligibility for disbursement of the new loan. The specific purpose of the PPF is to: (i) complete the designs for access roads to the communities that comprise the representative sample for that component, to bring them up to Bank standards; (ii) establish the National Transportation Sector Planning Office (ONPST) in the VMTCAC and

strengthen road subsector planning; (iii) update the road maintenance management system; (iv) identify and test modern road maintenance techniques and launch the initial phase of the pavement management system in order to improve the efficiency of road maintenance and extend the useful life of pavements; (v) train personnel in the areas of studies and projects and works supervision, in the SNC; (vi) strengthen administration and finance, as well as internal auditing and oversight; and (vii) purchase computer and communications equipment, pavement assessment equipment, road survey equipment, vehicles, and office equipment.

J. Bank strategy and the proposed program

- 1.40 The proposed program is consistent with the guidelines of the Bank's strategy for Bolivia, as set forth in the country paper for 1998-2000, and responds to the government's objectives through actions specifically designed to: (i) strengthen mechanisms for investment planning and priority-setting in the transportation sector, and primarily in the road subsector, which is the one that will have the greatest impact on national economic development; (ii) support consolidation of one of the most important trunk highways in terms of the country's domestic and regional integration; (iii) support implementation of a road maintenance management system that will ensure proper and effective use of resources and strengthen the capacity of the SNC to administer and regulate road use, primarily with respect to weight control; (iv) promote private-sector participation in the provision of road maintenance services; and (v) foster development of the productive sectors and private investment by reducing transportation costs.
- 1.41 After a prolonged period of inertia, and indeed of deterioration, in the management of the road subsector, the Government of Bolivia has taken a number of measures to resolve problems as a precondition for new Bank loans for the transportation sector (paragraph 1.12). These measures, supplemented with the support being provided under the PPF, should lead, in the next few months, to substantial progress in such aspects as restructuring of the SNC (paragraph 1.15); sector and subsector planning (paragraphs 1.16 to 1.19); organization and execution of road maintenance (paragraphs 1.21 and 1.22); and introduction of the weight control program (paragraphs 1.24 and 1.25). Besides meeting a priority need, the new operation will be indispensable in helping to consolidate government efforts to devise comprehensive solutions to the problems of the road subsector. In this respect, the program contains specific components that will provide technical and financial resources to ensure the implementation of modern, effective road management systems, which are now being implemented. In addition, training activities will be carried out for the staff who will be responsible for operating the systems and keeping them updated on an ongoing basis.

II. THE PROGRAM

A. Characteristics of the project area of influence

- 2.1 From the political and institutional view, the project's area of direct influence is the departments of Oruro and Potosí, including the capitals of these two departments, which are among the five largest cities in the country. In the past, the region enjoyed a booming economy, due primarily to mining, but today it is a depressed area, with a widely scattered population and growing migration, as people attempt to escape from isolation and the lack of economic opportunity. Most of the inhabitants are engaged in subsistence crop- and livestock-farming, gathering wood, and exploiting nonrenewable natural resources. Since these activities offer little opportunity for adequately paid employment, much of the rural population lives in extreme poverty and has little access to social services.
- 2.2 The works called for under the proposed program will be carried out in an area that has been exposed to human activity for several centuries, and consequently any direct adverse environmental impact from these works, particularly during the construction stage, will be of low intensity, localized, predictable, and mitigable. The impact of these works on the socioeconomic situation of the region will be essentially positive, and in any case measures will be taken to mitigate any disruption suffered by the residents of housing or users of public facilities (approximately 211 dwellings and other buildings) and to compensate those residents who will have to be relocated because the buildings are located in the right-of-way of the existing highway (paragraphs 2.12, 2.31, 5.24).
- 2.3 In the area of influence of the Ventilla-Tarapaya highway there are some buildings of historic value that are part of the region's cultural heritage and that have potential as tourist attractions. Measures are therefore included to restore these properties and improve access to them (paragraph 2.19).

B. Importance of the trunk highway from La Paz to the Argentine border

- 2.4 The trunk highway from La Paz to the Argentine border, of which the Ventilla-Tarapaya highway is part, serves the cities of La Paz, Oruro, Potosí, Tarija, and Bermejo, which together are home to 1.6 million people, representing 21.7% of the total population of Bolivia. This trunk highway is a segment of the Pan American Highway, which passes through Bolivia and carries international traffic between Peru and Argentina. In addition to its undeniable importance for trade flows between Bolivia and northern Argentina, the highway thus has considerable significance in terms of regional integration, since it constitutes a major link in commercial and tourist traffic between member countries of MERCOSUR and those of the Andean Community, which includes Bolivia.
- 2.5 Recognizing the importance of this trunk highway, the Bolivian government is making concurrent efforts to upgrade several sections that are currently unsuitable for international traffic, and to complete paving of the entire corridor. Work is currently under way to upgrade the Pazña-Challapata section (with financing from

the World Bank) and the Challapata-Ventilla section (with ADC financing). Bank support has been requested to finance upgrading and paving of the Ventilla-Tarapaya portion, and studies have begun for rehabilitation of the Potosí-Tarija stretch, with resources provided by FONPLATA. Thanks to these simultaneous measures, the Bolivian section of the Pan American Highway is expected to be fully paved within the next five years, thus linking the city of Desaguadero on the Peruvian border to La Paz and on to Bermejo at the Argentine border.

C. Program objectives

- 2.6 The general objective of the program to be financed by the Bank is to help enhance the competitiveness of the country's productive sectors in the context of growing trade, both domestic and foreign. Its purpose is to improve the level of service on the highways that make up the basic system, and reduce user costs.
- 2.7 The program's specific objectives are to upgrade the characteristics and structural capacity of the Ventilla-Tarapaya-Potosí stretch by undertaking roadway improvements, paving, and rehabilitation works, and to increase the usability of its access roads, in accordance with proper safety standards. The program will also introduce more efficient management methods for system maintenance and will implement measures for institutional strengthening to increase the sector's efficiency.

D. Components of the proposed program

1. Engineering and administration (US\$6.4 million)

a. Coordination unit (US\$900,000)

- 2.8 As part of its organizational structure, the SNC is establishing a coordination unit for projects with international organizations (PCU) that will report directly to the SNC Executive Director. The PCU will be responsible for coordinating internal and external activities for program execution, providing administrative support for the program, and acting as permanent liaison with the Bank. Salaries for additional professional personnel to be hired for staffing this unit and the cost of the equipment required for its operations will be eligible for funding under the Bank loan, throughout the program execution period. The unit must be established and staffed as a condition precedent to the first disbursement of the loan.

b. Studies and projects (US\$3 million)

- 2.9 Under this subcomponent, specialized consulting services will be hired to conduct technical, economic, and environmental studies, and to prepare the final engineering designs for other critical, high-priority sections of the basic highway system. These may include studies to devise a definitive solution to the problem of unstable embankments in the "El Sillar" section of the Cochabamba-Santa Cruz highway; technical studies on the use of new methodologies for stabilizing unpaved roads; and rehabilitation and/or upgrading projects for other stretches of the basic system.

c. Works supervision (US\$2.5 million)

- 2.10 Technical and administrative supervision of the works for upgrading and paving the Ventilla-Tarapaya section and rehabilitation works on the Tarapaya-Potosí section will be carried out by specialized consulting firms hired with resources from the loan. The primary responsibilities of the firms will be to: (i) review and verify compliance with technical standards and specifications for the projects they are supervising; (ii) review the designs, construction methods, and scheduling of the works being supervised and recommend changes or adjustments to rectify any errors or omissions in the basic documentation or to achieve savings without sacrificing quality; (iii) certify the quality of the works and installations being supervised and verify proper implementation of the road safety and environmental protection measures called for; and (iv) file monthly progress reports on the works and an assessment of contractor performance. Supervision of improvement works on community access roads, as well as construction of the weight control stations and restoration of historical monuments under the program will be the responsibility of the SNC's supervision division personnel or of specialized entities under contract, which will have responsibilities similar to those of the supervisory firms described in the previous paragraph. The operating expenses of these supervisory units will be part of the counterpart funding for the proposed Bank loan.

2. Civil works (US\$45.4 million)

a. Upgrading and paving of the Ventilla-Tarapaya section (US\$31.5 million)

- 2.11 The Ventilla-Tarapaya section is 84 kilometers in length and runs through a region where altitudes range from 3,300 to 4,200 meters above sea level. Most of the section lies in moderately undulating terrain in which no major changes are required in the horizontal and vertical alignment of the existing road, and where a large part of the existing drainage system can be used. It is only in the 30% of the section where the topography is mountainous that significant alterations are planned. There, a two-kilometer portion will be realigned to reduce the grade and allow construction of a new bridge over the Pilcomayo River. In addition, some of the curves will be reconfigured to increase their radius and so increase the user safety.
- 2.12 The proposed routing passes through the towns of Yocalla, Tambo Alcala, Chullpa Khasa and other, smaller settlements, where it will be necessary to conduct some expropriations and to relocate schools, community centers, and dwellings, the costs of which will be part of project (paragraph 3.18). The component also includes paving access roads in the area of Ventilla, since a detour will be built to route traffic around the town.
- 2.13 The major headings included in the upgrading and paving works for the Ventilla-Tarapaya section will be: (i) excavation and grading; (ii) laying a base and subbase of processed materials; (iii) laying an asphalt surface and constructing shoulders; (iv) expansion or construction of new drainage and masonry works; (v) construction of a new 120-meter bridge over the Pilcomayo River; (vi) protection of embankments; and (vii) installation of road safety devices and signage.

b. Rehabilitation of the Tarapaya-Potosí section (US\$1.7 million)

- 2.14 The geometric characteristics of this approximately 23-kilometer-long section are suitable for projected traffic volumes over the next 20 years, and the existing pavement is in good condition. However, given the age of the road and the expected increase in heavy traffic once the entire highway is improved from La Paz to the Argentine border, the load capacity of this stretch needs to be upgraded to that of the new pavement to be constructed on the Ventilla-Tarapaya stretch. The following works are therefore planned: (i) resurfacing of the pavement to strengthen it; (ii) rebuilding of the shoulders, with asphalt priming; (iii) minor repairs on the drainage works; and (iv) complementary signage and road safety works.

c. Community access roads (US\$2.6 million)

- 2.15 Along the Ventilla-Tarapaya section, there are a number of local roads that, although they carry little traffic, are the only means by which rural communities located in the area can move their meager production surpluses and gain access to local services in better-equipped urban centers. These roads are in such poor condition that they make regular traffic difficult. To extend the benefits of the program to these communities, works will be carried out to improve the access roads and make them passable year-round. The Department of Potosí, in coordination with the respective municipal agencies and communities concerned, has identified seven roads as priorities, with a total length of some 150 kilometers. These roads will be upgraded by the following basic measures: (i) grading of the existing roadway, especially in areas where the subbase is unstable; (ii) standardization of the wearing course widths to a maximum of 6 meters; (iii) construction of drains and ditches to improve surface drainage; (iv) laying of a 12 cm layer of compacted crushed stone, with the incorporation of stabilizing agents where necessary; and (v) construction of a bridge with a span of approximately 80 meters on the road linking the communities of Ventilla and Macha.

d. Maintenance of the basic highway system (US\$5.5 million)

- 2.16 The three-year maintenance contracts to be signed by the SNC with private firms provide only for routine maintenance on the roads that make up the basic system. Program resources earmarked for this component will therefore be used to finance periodic maintenance for certain stretches that are already paved and that are in the greatest need of attention in order to prevent any further deterioration. Up to US\$300,000 will be used for an experimental program on unpaved roads, with construction of 500-meter pilot segments, on which various soil stabilization techniques will be tested with a view to selecting for general use those that are found most effective in reducing maintenance costs for the basic system.

e. Constructing weigh stations and toll booths (US\$3.9 million)

- 2.17 The proposed program will support implementation of the medium-term plan for weight control by the SNC (paragraph 1.25), under which permanent control stations are to be built and weigh scales and electronic control systems purchased and connected to the integrated communications system that will be installed in the SNC. The resources earmarked for this subcomponent will be used to build the weigh

stations and the attendant parking and service areas, as specified in the plan. The weigh scales, electronic equipment, and computers required will be purchased through a recently approved parallel loan from the NDF (paragraph 2.29). The SNC will have to take the necessary steps to make available the lands for building the stations in a timely manner (paragraph 2.32).

- 2.18 Similarly, the proposed program will help to establish a new, centralized system of toll collection by financing the construction or remodeling of toll booths, located and designed in accordance with the study that is current under way (paragraph 1.28). The equipment for this system will also be financed by the NDF.

3. Restoration works for historic heritage sites (US\$200,000)

- 2.19 As part of the measures to mitigate the environmental and social impact of the project, the 18th century Church of Salinas in Yocalla will be restored; it is classified as one of the representative monuments of Andean baroque religious architecture, and which is thus part of the national cultural heritage. Restoration of this church, which is of great cultural significance to the local population, and improving access to it, will also contribute to enhancing the region's tourism potential.
- 2.20 The 18th century stone masonry bridge that now crosses the Pilcomayo River is unsuitable for current traffic and will be removed from service once the new bridge is constructed. The old bridge is also part of the historic heritage, and will be properly restored and protected with program funding.

4. Institutional strengthening (US\$5.65 million)

- 2.21 The changes that will be made in the structure of the SNC, beginning in 1999, to bring its functions and responsibilities into line with the provisions of Decree 25134, and the decision to outsource most road maintenance activities, will mean redistributing and supplementing its staff, as well as training key personnel in their new responsibilities. Under this component, technical advisory and training services will therefore be hired, and temporary financing provided for the additional personnel needed to achieve the project objectives and support the structural transformation of the SNC. The component resources will also be used to support implementation and operation of systems for collecting and processing statistical data needed to improve investment planning and monitor the performance and impact of these investments.

a. Training and specialized advisory services (US\$1.3 million)

- 2.22 The assessment of SNC and VMTCAC personnel, the diagnosis of staff reduction requirements, the hiring of new personnel, the provision of training, and the preparation of a specific plan to meet these needs, all now under way with PPF funding, will provide the basis on which the borrower and the Bank will draw up a detailed plan for personnel reinforcement and training (PDFCE), to be financed under this subcomponent (paragraph 3.12). Accordingly, prior to the first disbursement a program for this purpose and an implementation schedule for the program must be submitted to the Bank, to be reviewed and updated as part of the AOP reviews. A portion of the resources under this subcomponent may also be used

to hire specialized advisory services to address any specific problems arising during program execution.

- 2.23 Part of the NDF loan will be used to provide technical cooperation to the Departmental Road Administrations (SDCs) to develop a corporate structure in them for the execution of maintenance works at the departmental level. This training will begin in the departments of Oruro and Potosí to assist them in the access road upgrading activities to be carried out under the program. In addition, the SDC reorganization process will include exploration of how to promote the establishment of road maintenance microenterprises in all the departments.

b. Basic transportation data and statistics (US\$1.05 million)

- 2.24 Proper planning in the transportation sector and the road subsector requires an ongoing supply of up-to-date, reliable statistical information. Data collection and processing mechanisms will therefore have to be adopted to ensure a permanent flow, not only of basic information for selecting and prioritizing investments but also of data that can be used to assess the performance and effectiveness of those investments. The virtual paralysis of activities and the lack of operating resources that the SNC suffered between 1996 and 1998 led to a breakdown in information collection and interrupted the output of the road statistics that are essential for those purposes. Accordingly, part of the resources under this subcomponent will be used to restore the SNC's capacity to conduct road surveys and traffic counts and surveys, and to consolidate statistics on traffic accidents, among other information. The NDF loan will be used to finance modern technology (geographic positioning system [GPS] and geographic information system [GIS]) in the management of road surveys and statistics, supplementing the studies currently being financed by the Bank under operation ATN/JF-6073-BO. Moreover, environmentally vulnerable areas in the areas of influence of the national system highways will be identified and located.

c. Pavement management system (US\$600,000)

- 2.25 The steady increase in the paved portion of the basic system makes it essential for the SNC to develop and introduce a pavement management system (SGP) that will provide technical information on the performance of the paved sections, to serve as the basis for any interventions needed to extend their useful life. The proposed program therefore includes resources to support implementation of the system, by hiring consulting services to develop the SGP, financing the purchase of equipment for pavement assessment (paragraph 2.28), and providing for training SNC personnel in the execution of field and laboratory work (paragraph 2.22).

d. Assistance for the Environmental Protection Unit (US\$1.2 million)

- 2.26 This subcomponent includes resources to carry out activities for strengthening the Environmental Unit, through advisory services and training that will help to ensure proper monitoring and verification of compliance with environmental protection regulations and execution of measures to mitigate any adverse social and environmental impact expected under the program (paragraph 3.20).
- 2.27 Furthermore, this item includes financing for environmental protection activities that, given their specialized nature, could not be incorporated into other subcomponents,

such as reforestation work to preserve endangered plant species from extinction, wildlife protection, and measures to avoid contamination of water sources from spills of hazardous substances being transported. The bulk of the environmental costs related to implementation has been included in the cost of those works.

5. Procurement of equipment (US\$5.2 million)

a. Engineering and road safety equipment (US\$400,000)

- 2.28 This component will finance the purchase of engineering equipment and instruments to support field and in-house work related to conducting road surveys, collecting basic information, supervising studies and works, and assessing pavement performance. It also includes the purchase of equipment for materials testing and quality control, and other instruments for the soil and asphalt laboratories. All purchases of specialized equipment must include training in their operation and maintenance, which may be provided by the suppliers themselves or by third parties.

b. Scales and equipment for weigh stations (US\$3.2 million)

- 2.29 The procurement of scales, electronic devices and other equipment necessary to install the integrated weight control system to be defined in the medium-term plan will be financed in its entirety by the NDF loan (paragraph 2.17).

c. Computers and communications equipment (US\$1.6 million)

- 2.30 Computers and communications equipment will also be purchased to supplement the initial stage of introducing the computerized system that will integrate the systems required both by the SNC and the VMTCAC for their own operations and for exchanging information between each other, with regional offices and with other bodies, and for interconnection of the toll stations.

6. Associated costs (US\$700,000)

a. Rights-of-way and relocation (US\$450,000)

- 2.31 The design of the works to upgrade the Ventilla-Tarapaya highway calls for minor modifications in the alignment of the roadway and widening of the cross section of the road where it passes through towns, so as to ensure better public safety and allow buses and freight vehicles to stop without the risk of accidents. These geometric improvements will affect dwellings and public buildings located within the present right-of-way, and their occupants will have to be relocated (paragraph 3.18). Construction work will be financed by the Bank (US\$315,000), while local counterpart funds will be used to purchase all land for relocation and to pay any monetary compensation (US\$135,000).

b. Land for weight control stations and toll booths (US\$250,000)

- 2.32 The costs of acquiring land for weight control stations and toll booths will be borne by the borrower and will represent part of the counterpart funding for the proposed operation. The process of acquiring and taking possession of the land must be completed before bidding is authorized for the works at each site.

E. Cost and financing

1. Program cost

- 2.33 The cost of the program will be US\$70.5 million, of which the Bank will finance up to the equivalent of US\$52 million with resources from the Fund for Special Operations (FSO) and the NDF will finance SDR 5 million (equivalent to approximately US\$6.8 million); the balance of US\$13 million will be provided by the National Treasury (TGN). Table 2.1 shows the components, the amount of investments under each one, and its source of financing.

Table 3.1 – Program costs and financing

(in thousands of US\$)

PROGRAM COMPONENT		TOTAL COST	CONTRIBUTION		
			IDB	NDF	LOCAL
1 -	ENGINEERING AND ADMINISTRATION	6,378	4,568		1,810
1.1 -	Coordination unit /IDB(54 mo.)	900	450		450
1.2 -	Studies and projects	3,000	2,136		864
1.3 -	Supervision of works	2,478	1,982		496
2 -	CIVIL WORKS	45,400	37,070	1,020	7,310
2.1 -	Upgrading and paving, Ventilla-Tarapaya	31,500	26,460		5,040
2.2 -	Pavement reinforcement, Tarapaya-Potosi (25 km)	1,700	1,428		272
2.3 -	Community access roads	2,600	2,132		468
2.4 -	Maintenance of the basic highway system	5,500	4,546		954
2.5 -	Construction and restoration of buildings	4,100	2,504	1,020	576
3 -	INSTITUTIONAL STRENGTHENING	5,650	3,815	1,300	535
3.1 -	Training	1,300	630	600	70
3.2 -	Basic information and road statistics	1,050	305	700	45
3.3 -	Pavement management system (SGP)	600	540		60
3.4 -	Environmental unit and protection measures	1,200	840		360
3.5 -	PPF repayment	1,500	1,500		
4 -	PURCHASE OF EQUIPMENT	5,200	1,250	3,800	150
4.1 -	Engineering and road safety equipment	400	170	200	30
4.2 -	Weighing equipment	3,200		3,200	
4.3 -	Computers and communications equipment	1,600	1,080	400	120
5 -	ASSOCIATED COSTS	700	315		385
5.1 -	Rights-of-way and relocation	450	315		135
5.2 -	Procurement of land for weigh stations	250			250
6 -	UNALLOCATED	5,977	4,462	680	835
6.1 -	Contingencies	4,102	2,844	680	578
6.2 -	Price escalation	1,875	1,618		257
	SUBTOTAL	69,305	51,480	6,800	11,025
7 -	FINANCE CHARGES	2,495	520		1,975
7.1 -	Interest	1,465			1,465
7.2 -	Credit fee	510			510
7.3 -	Inspection and supervision	520	520		
	TOTAL	71,800	52,000	6,800	13,000
	PERCENTAGE	100%	72.4%	9.5%	18.1%

III. PROGRAM EXECUTION

A. Borrower and executing agency

- 3.1 The borrower of the proposed Bank loan will be the Republic of Bolivia, which will also be responsible for the timely allocation of the local counterpart funds. The executing agency for the program will be the National Road Administration (SNC). The SNC and the Office of the Deputy Minister for Transportation, Communications, and Civil Aviation (VMTCAC) will be the program beneficiaries.

B. Program execution and administration

- 3.2 The SNC will be the principal executing agency of the proposed program and as such will be responsible for ongoing coordination with the Bank and for compiling all administrative and financial information needed to prepare the periodic reports and disbursement requests. To this end, it will establish a Coordination Unit for projects with international organizations (PCU), which will act as permanent liaison with the Bank.
- 3.3 The components that will be executed directly by the SNC will be all the ones under the civil works subprogram in its entirety and the programs for institutional strengthening and training for SNC offices in the areas of: (i) investment planning and programming in the road subsector; (ii) updating of the maintenance management systems and introduction of the pavement management system (SGP); (iii) preparation of studies and projects; (iv) technical and environmental supervision and inspection of works; (v) development and implementation of the vehicle weight control and toll collection systems; (vi) administrative and financial management; and (vii) internal control and auditing. The SNC will also be responsible for purchasing vehicles, engineering and pavement assessment equipment, and all procurement directly related to the functions and activities established in Supreme Decree 25134, except for those specifically indicated in the following paragraph.
- 3.4 The VMTCAC will be responsible for components relating to: (i) sector planning in the sphere of competence of the ONPST; (ii) implementation of the integrated VMTCAC-SNC computerized information network; (iii) development and installation of the geographic information system (GIS); and (iv) policy-setting and identification of potential road concessions.
- 3.5 As principal executing agency, the SNC may also enter into agreements with other public or private institutions, delegating to them the authority to execute certain program components, such as: (i) resettlement of people affected by improvements to the Ventilla-Tarapaya section; (ii) restoration of historical monuments in the program's area of influence; and (iii) reforestation work to protect endangered plant species.

C. Status of program preparation

- 3.6 The technical, economic, environmental, and social studies and the designs for the civil works projects have been completed. They were carried out by specialized

consulting firms using methodologies acceptable to the Bank and according to specifications and standards consistent with international usage. The recommendations of the social and environmental studies with respect to the direct impact of the works were taken into consideration in preparing the construction designs and specifications, in order to include the necessary protection measures, the costs of which are included in the total cost of the works.

- 3.7 With respect to organization of the subsector, the SNC has already approved its new structure (paragraph 1.15) and has initiated the process of transition to that structure, which involves retraining its personnel, optimizing use of its assets, and modernizing and computerizing its operating and management procedures. The SNC has submitted a maintenance plan for 1999-2001 to the Bank (Table 3.1), and is in the process of hiring the firms that will carry out the routine maintenance, in accordance with the 1999 plan. The SNC has also submitted its short-term plan for vehicle weight control (paragraph 1.24), along with information needed to size the other components for strengthening the technical capacity of the SNC and VMTCAC.
- 3.8 The construction methods proposed for execution of the works are conventional and the unit prices used to determine their cost are based on salaries for manual labor and on prices for materials and equipment rentals that are consistent with those of the local market, and are generally within the range of bids for similar works received in recent calls for bids. Accordingly, an adequate level of competition in the bidding procedures to be conducted can be expected. With the authorization of the project team, a General Procurement Notice (GPN) has been published.

D. Program execution strategy

1. Execution and supervision of works

- 3.9 All the works called for under the program (with the exception of the upgrading of community access roads, which will be the responsibility of the departmental governments – see paragraph 3.25), will be carried out under contract by specialized construction firms with experience in Bolivia or in other countries of the region. The works will be supervised by consulting firms, and in the case of small construction projects and specialized restoration work on historical monuments, supervision will be carried out by individual consultants with demonstrated experience in such works.
- 3.10 Supervision of access road upgrading works will be performed directly by the SNC, with its own personnel or with individual consultants hired in the service of that entity. Progress reports for the Bank, as well as disbursement requests, will follow procedures similar to those required of consulting firms.

2. Institutional strengthening

- 3.11 The institutional strengthening activities for the development and implementation of administrative and operating systems (Maintenance management, pavement management, GIS, and others) and training services, may be provided through contracts with consulting firms, specialized institutions, or individual experts, depending on the size, complexity, and diversity of the professional fields involved in each case, subject to prior agreement between the borrower and the Bank.

- 3.12 The detailed plan for personnel strengthening and training (PDFCE) (paragraph 2.22) must be agreed upon with the Bank, clearly identifying the goals that are to be achieved through the use of the PPF resources and those that are to be achieved with the resources of the proposed Bank loan, and identifying the parameters that will be used to assess the effectiveness of the plan. The training programs recommended must include an in-service training stage, so as to give beneficiaries the opportunity to assimilate what they have learned and to identify any need to strengthen or supplement certain areas not covered in the theoretical instruction. The PDFCE will identify and recommend the most appropriate means of carrying out these programs.

3. Highway maintenance

- 3.13 The borrower will agree to effectively implement the SAM and the GIS for the entire basic highway system, and will submit an annual maintenance report, beginning in the year 2000, throughout the program execution period, execution of the plan for the previous year, the maintenance plan for the current year and the amount of the budget allocations for maintenance. The report must also include the following information: (i) identify the sections that are being maintained under contract and by delegation to the SDCs; (ii) describe and quantify maintenance work performed; (iii) assess the performance of the contracted firms and actual average costs; (iv) classify the general state of repair of the sections that make up the system; and (v) describe the extent to which the weight control system has been implemented and its performance. External consultants will be hired on short-term contracts using resources from this operation to review the annual maintenance plans and to verify compliance with them, during the entire loan execution period.
- 3.14 The maintenance plan for 1999-2001 (Table 3.1) has been reviewed by the project team and is considered feasible. The estimated budget for routine maintenance in 1999 is US\$15.5 million, which is approximately equal to the revenues that SNC will receive from toll collections on the basic system (70% of the total). Approximately US\$5 million from World Bank loan 2395-BO, as well as a portion of the contributions to the proposed operation, will be earmarked for periodic maintenance, thereby covering the bulk of the most urgent work. Confirmation that the contracts called for under the 1999 plan are in execution according to the timetable for their implementation will be a condition precedent to the first disbursement of the loan.

Table 3.1 – Maintenance Plan 1999-2001

Financing for the Plan (US\$000)	1999	2000	2001	Total
Length of roadway (km)	8,104	6,707	6,707	21,518
Cost of works				
Routine maintenance	15,497	14,428	14,191	44,116
Periodic maintenance	8,009	5,763	2,916	16,688
Emergency works	2,221	2,237	2,276	6,734
Minor works	103	897	775	1,775
TOTAL (A)	25,829	23,326	20,158	69,313
Minimum works required (B)	18,080	18,661	18,142	54,883
Percentage (B/A)	70%	80%	90%	80%
Sources of financing				
Highway tolls *	12,935	12,250	13,585	38,770
IBRD loans **	3,329	2,065	4,100	9,494
IDB (BO-0098)	1,500	3,800	0	5,300
Subtotal (C)	17,764	18,115	17,685	53,564
TGN contribution to cover minimums agreed	316	546	457	1,319

Source: Maintenance Department – SNC – January 1999

* A 20% toll increase will be considered as of 2002

** IDRB funding would be US\$4.5 million per annum for 2002 and 2003

- 3.15 With implementation of the maintenance plan proposed by the SNC and consolidation of measures to ensure sustainable maintenance at suitable levels, it is expected that by program completion in 2003, 100% of the necessary annual maintenance will be carried out, to the point where the proportion of roadway in poor or very poor condition, currently 35% of the basic system (paragraph 1.20), will be reduced to less than 10%, and all paved stretches of the system will be at least in fair condition.
- 3.16 Achieving the proposed maintenance goals with respect to the overall condition of the system will also depend on timely execution of the short- and medium-term plans to introduce and operate permanent weight control systems (paragraphs 1.24 and 1.25). Similarly, it is crucial that the pavement management system be operational as soon as possible. Special attention will therefore have to be paid to all the subcomponents that will support implementation of those systems (paragraphs 2.17, 1.24, and 2.32). Consequently, the periodic program reviews will include verification of progress under those headings (paragraph 3.23).

E. Social and environmental impact

- 3.17 The following studies were conducted as part of the environmental impact assessment (EIA) to ensure that any adverse environmental impact is properly mitigated: (i) analysis of potential indirect socioeconomic impact of operation of the highway over the medium and long terms; (ii) a detailed socioeconomic survey of the population directly affected by the works (expropriations); (iii) preparation of a compensation and resettlement plan (PRIPA), under which people with different income levels will be treated differently, including detailed institutional arrangements for implementing this plan properly (agreements between the SNC and

the departments); (iv) identification and correction of existing environmental liabilities; (v) analysis of the problem of transporting hazardous cargo on the highway; and (vi) analysis of traffic and pedestrian safety problems on stretches where the highway passes through urban areas.

- 3.18 The PRIPA provides for indemnification, resettlement, purchase of materials, reconstruction, and other alternatives, as appropriate, to compensate the families affected, and was approved in public consultations with the communities directly involved (total cost: US\$700,000). A total of 211 dwellings will be affected, as well as 130 plots of land and 10 other properties. In most cases, the entire property is not affected. Thus, 224 cases will be settled through financial compensation, while the others will call for reconstruction or rehabilitation (63) or relocation (37), and only 43 will require resettlement.
- 3.19 As required under Bolivia's environmental legislation, a document was published summarizing the EIA for the Ventilla-Tarapaya project, and public consultations were held, including public hearings that began on November 7, 1998, in accordance with mechanisms and procedures agreed upon by the SNC, the MDSP, and the Bank.
- 3.20 The environmental management capacity of the SNC has been assessed, and the necessary measures to strengthen it have been identified, particularly through training courses in evaluating the environmental impact of highway works. The institutional strengthening component provides for updating the highway design manuals used by the SNC, to incorporate the environmental factors that must be considered in the design of such works. The recommendations of the environmental report are attached as Annex III-2.

F. Highway safety

- 3.21 The design parameters used for the project to upgrade and pave the Ventilla-Tarapaya and Tarapaya-Potosí sections include highway safety concepts applicable to such works. In addition, special attention has been paid to safety features for pedestrian and nonmotorized traffic on sections that pass through or near populated areas, particularly in the vicinity of schools and community facilities where there are frequently large numbers of people (paragraph 3.17).
- 3.22 In general, the Bolivian authorities are concerned about highway safety, because of rising traffic accident rates, particularly in urban areas. The Government of China recently provided support through the donation of speed radar equipment, breathalyzers, and other items to enhance the effectiveness of police controls. This is a highly complex issue, involving responsibilities in many areas, such as vehicle inspection, driver licensing, police surveillance, and user awareness, beyond the scope of both the SNC and the proposed program. However, the PPF under which this operation was prepared included resources to hire a specialist in highway safety who will prepare an evaluation of the current situation, make recommendations, and identify areas the Bank could support.

G. Monitoring achievement of program goals

- 3.23 Given the nature of this program, particularly with respect to organization of the road subsector, institutional strengthening, and the implementation of systems to improve

the efficiency of road maintenance, the Bank will need to monitor progress periodically to ensure the program goals are met. To this end, the SNC will agree with the Bank on an annual operating plan (AOP), which will be reviewed jointly each year in April and October, or at such other dates as may be mutually agreed upon. The purpose of the April review will be to verify the progress made during the previous year and identify any necessary adjustments in the AOP for the current year. The purpose of the October meeting will be to agree on the AOP for the coming year and to verify that the proposed SNC budget for that year contains sufficient allocations for the AOP agreed upon to be viable. Prior to the first disbursement of the loan, the borrower must submit the AOP for the first year of the program to the Bank and have agreed with the Bank on the parameters for evaluating progress towards the achievement of the program goals. Should any shortcomings in the implementation of the AOPs be found to be jeopardizing achievement of the program goals, the Bank may require the borrower to take the necessary measures to achieve an acceptable level of progress.

H. Procurement of goods and consulting services and awarding of construction contracts

1. Civil works

- 3.24 Contracts for civil works in amounts exceeding the equivalent of US\$3 million will be awarded through international competitive bidding (ICB), in accordance with normal Bank procedures, through the prequalification process. The "two-envelope system with deferred opening" may be used. Contracts for civil works in amounts below US\$3 million will be awarded following the procedures prescribed by national legislation.
- 3.25 Given the characteristics of the improvement works for community access roads, after verifying the capacity of the Departmental Road Administrations of Potosí and Oruro, the Bank and the Bolivian authorities agreed that these works would be performed by the departmental governments through direct contracting, by means of agreements to be entered into with the SNC. The agreements will contain requirements similar to the contracts with private firms, with respect to specifications, quality control and environmental protection requirements, measurement and payment systems, and execution schedules. The total amount of works involved in such agreements, which must be signed prior to the first disbursement of the loan, may not exceed the equivalent of US\$2.6 million.

2. Equipment and other goods

- 3.26 For the procurement of vehicles, equipment, and other goods called for under the program, and for which resources from the proposed loan are to be used, for amounts greater than the equivalent of US\$350,000, ICB procedures as established by the Bank, will be followed. Procurement in amounts below this threshold will be carried out according to the procedures prescribed by local legislation, provided that they do not conflict with Bank procedures.

3. Consulting services

- 3.27 Contracts for consulting services for studies, works supervision, advisory services, and other services to be carried out by specialized consulting firms, in amounts exceeding the equivalent of US\$200,000, will be awarded through international calls for proposals (ICP), following Bank rules and procedures. Contracts in amounts below that threshold will be awarded following the procedures prescribed by national legislation.
- 3.28 Contracts for consulting firms and individual consultants in general in amounts below the equivalent of US\$30,000 may be awarded by direct contracting, taking into account the background of the firms and the qualifications of the consultants proposed.

4. Procurement plan

- 3.29 The procurement plan attached as Annex III-1 shows the tentative dates for the publication of announcements and calls for tender or invitations to submit proposals, as well as the approximate amounts of the contracts to be executed under the program, and indicates the type of procedure to be followed in each case.

I. Revolving fund and disbursement schedule

- 3.30 The borrower must open a special account for a revolving fund, for which an initial deposit of 5% of the total amount of the proposed loan will be authorized.
- 3.31 The execution period of the program will be 48 months and the disbursement period 54 months, according to the tentative program execution schedule and the timetable for disbursements.

J. Recognition of previous expenditures

- 3.32 The borrower has requested that up to US\$1 million in previous expenditures incurred between January 15, 1999 and the date the loan is approved be recognized as part of the proposed loan and up to US\$500,000 as part of the local counterpart funding. The expenditures covered would be for: works for resettlement of people affected by the road works; procurement of computer, engineering, and road safety equipment; construction or rehabilitation of weight control stations; consulting services for preparation of the plans and studies for the program; and bidding on works and the procurement of rights-of-way.

K. Ex post evaluation

- 3.33 The periodic reviews to monitor program execution (paragraph 3.23) will provide the bulk of the information necessary to conduct an ex post evaluation of the program. The borrower and the executing agency have agreed to conduct this evaluation jointly.

IV. THE BORROWER AND EXECUTING AGENCY

A. Institutional analysis

1. The National Road Administration (SNC)

a. Nature and functions

- 4.1 The SNC is a decentralized agency linked to the Ministry of Economic Development through the Office of the Deputy Minister for Transportation, Communications, and Civil Aviation (VMTCAC). The SNC's organizational structure is set out in its charter of July 1979 and subsequent amendments. In particular, Supreme Decree 25134 of August 21, 1998 reorganized its structure and defined its functions, effective January 1, 1999.
- 4.2 The decree divides the Bolivian road system into three categories: basic, departmental, and municipal. The essential functions of the SNC, according to that decree, are studies, construction, upgrading, conservation, supervision, and administration of the basic system. The departmental system is the responsibility of the Departmental Road Administrations (SDCs), which report to the departmental governments. The municipal system is the responsibility of the municipalities.

b. Institutional structure

- 4.3 The structure of the SNC, pursuant to the decree, includes the following levels:
 - a. executive offices: Offices of the Director and Deputy Director;
 - b. management support: legal counsel, planning, monitoring and oversight, General Secretariat, computer center, auditing and public information;
 - c. technical operations: departments of maintenance, studies and design, construction, regional units, center for technical research and standards, environment division, and vehicle control and statistics division; and
 - d. finance and administration: departments of administration, procurement, and finance.

c. Human resources

- 4.4 Personnel matters in the SNC are governed by Supreme Resolution 213064 and are the responsibility of the human resources division, which reports to the SNC administration department.
- 4.5 As a result of the Administrative Decentralization Act of December 1995, the SNC's entire staff complement was reduced from 3,636 to 365, through the transfer of the SDCs, with all their personnel and equipment, to the departmental governments. Since that date, there have been no substantial changes in the number of SNC staff, which was 371 as of December 31, 1998, of whom 297 are permanent and 74 are on contract. Prior to decentralization, the SNC was the agency responsible for administration, operation, and maintenance of the entire national road system—basic, departmental, and local or municipal. Most of its professional and technical staff,

especially those assigned to operations and oversight responsibilities, were therefore located in the departmental offices (the SDCs). At SNC headquarters in La Paz, staffing consisted primarily of managers and office workers needed to administer an institution with some 3,600 employees. It is not surprising, then, that the staff remaining at the SNC, consisting solely of employees based in La Paz, is currently 75% administrative and 25% technical.

- 4.6 The new organizational structure that the SNC must adopt to carry out its functions under Decree 25134 will require qualified personnel in sufficient numbers to exercise effective administration and supervision over services that will be outsourced almost in their entirety. At the same time, its administrative staff will be sharply reduced, reversing the ratio of professional to administrative staff indicated above. For example, the maintenance department has a staff of 22, of whom only 12 are engineers, and it will need to hire additional technical personnel (at least 21 new engineers) to supervise the first maintenance contracts. The SNC will draw up a program to resolve these matters (paragraph 2.22).

d. Financial management, the budget, and budgetary control

- 4.7 Management of the SNC's financial resources and budget execution oversight is carried out by the finance department, except for control and management of the capital accounting system, which is the responsibility of the administration department. The finance department has three divisions: accounting and budget, revenue, and treasury. The performance of these departments is considered satisfactory. Nonetheless, given the new role that the SNC must play, these departments will be strengthened by hiring two consultants using PPF resources. The PPF will also be used to improve their information systems and to undertake the institutional strengthening component.

e. Internal and external control of the SNC

- 4.8 The Government of Bolivia has instituted a system of internal and external controls over SNC transactions. Internal auditing is carried out by the internal audit department, which reports to the SNC's Office of the Executive Director, while external auditing is carried out by the Office of the Controller General of the Republic, which reports to the National Congress. Both of these units are performing their respective responsibilities in a satisfactory manner.
- 4.9 The reorganization of the SNC, which became effective in 1999, calls for dividing the internal audit department into two sections: financial auditing and technical auditing. The purpose of separating these responsibilities is to enhance their efficiency. A two-stage plan will be undertaken to strengthen the department. First, within six months after signature of the loan contract, four civil engineers will be hired to perform technical audits and two accounting experts will be engaged to reinforce financial auditing. At the same time, computerization of these tasks will be launched, and personnel trained through the PPF. The second stage will be determined on the basis of recommendations by the PPF consultants, and will be part of the institutional strengthening component.

- 4.10 The audit of the program financial statements will be performed by a firm of independent public accountants acceptable to the Bank.

f. Financing the road subsector

- 4.11 The resources needed to finance SNC activities come primarily from the following sources: (i) direct transfers from the TGN; (ii) resources earmarked for the departmental governments to cover the local counterpart contributions to projects carried out in their jurisdictions; (iii) resources from international financial institutions; (iv) 70% of gross highway toll revenues; and (v) donations from other institutions. A further source of funds consists of the fines levied on carriers traveling with excess loads. Since collection of these fines is highly inefficient, the program includes a component to remedy the situation (see paragraph 1.24).
- 4.12 In addition to the sources indicated above, the VMTCAC plans to introduce a system of highway concessions, on a small scale, to involve the private sector in financing activities in the highway subsector (paragraphs 1.29 and 1.30).

2. Office of the Deputy Ministry for Transportation, Communications, and Civil Aviation (VMTCAC)

- 4.13 The VMTCAC units involved in this program are those responsible for transportation sector planning and for road concessions. These units are well structured, but require strengthening, which will be provided as part of the PPF and under the institutional strengthening component.

3. Departmental Road Administrations (SDCs) of Potosí and Oruro

- 4.14 The SDCs of Oruro and Potosí report to the respective departmental governments. They have qualified personnel and adequate equipment to carry out the tasks for which they will be responsible under the proposed program.

B. Local counterpart contribution

- 4.15 The financing structure of the proposed program includes local counterpart funding in the amount of US\$13 million equivalent. These resources will come from the TGN and from the sales tax on hydrocarbons (IEHD), which the TGN transfers to the departmental governments to finance road projects in their jurisdictions. Approximately US\$9 million of the counterpart funding will have to be covered by the departments, roughly 90% (US\$8.1 million) by the Potosí department and the remaining 10% (US\$900,000) by that of Oruro. As Table 5.1 indicates, the proceeds from the IEDM that will be transferred to each of the two departments over the period 1999-2003 will tend to decline, but will remain sufficient for program needs.
- 4.16 The analysis conducted confirmed that the proposed highway project represents the most important project that the two departments plan to carry out in the coming years, and they have therefore accorded it financial and institutional priority. The following chapter includes an analysis of the financial commitments of both departments, linked to IEHD resources (Table 5.2), and financial projections for the program execution period (paragraph 5.10).

V. FEASIBILITY AND RISKS

A. Technical feasibility

- 5.1 The works to be financed under this program consist of upgrading existing roads, and therefore do not entail any major construction complications or technical problems. While they are to be undertaken in a region where climatic conditions are severe, with low temperatures and altitudes exceeding 3,500 meters above sea level, these factors have been taken into account in designing the projects, and there is local experience in working under such conditions.
- 5.2 The engineering designs have taken into account available meteorological statistics for the region, the geomorphologic and geodynamic characteristics of the area in which the civil works are located, and the findings of recent surveys and traffic counts. The sizing of the works is therefore considered appropriate and will ensure the stability and durability of the works. Although the entire Andean region is subject to seismic activity, and mountainous areas regularly experience landslides, there is no history or evidence of catastrophic phenomena of this type, and the works themselves involve no major earthwork or steep cuts that might alter the natural equilibrium of the terrain.
- 5.3 With the support being provided through the PPF, certain key areas of the beneficiary agencies are expected to be strengthened and the necessary advisory services will be provided so that they can address the technical and administrative problems.
- 5.4 The outsourcing of road maintenance work, which the SNC will introduce, will be a new experience in Bolivia, both for the contracting firms and for the body that is to manage and supervise the contracts. This may initially lead to problems in providing maintenance for the basic system (paragraph 1.22). Accordingly, the operation includes financing under the PPF to provide training for the SNC and private firms, to be supplemented by other, larger-scale training programs as part of the institutional strengthening under of the proposed program.
- 5.5 The execution of previous loans, including the preparation of new operations, has suffered from undue delays in the awarding of contracts for studies and works, caused by complaints and protests, most of them groundless, that were filed by certain participants in bidding procedures, because the bidding procedures were conducted by entities outside the transportation sector that lacked the necessary experience and technical support. This risk will be reduced, now that the sector agencies themselves will once again be responsible for conducting the bidding procedures.

B. Institutional feasibility

- 5.6 The institutional structure that will execute the program is the SNC, which has experience in this area. The SNC has executed a number of projects financed by the IDB and by the World Bank.

- 5.7 To ensure proper control and coordination of all activities to the undertaken during execution of this operation, the SNC will set up a Coordination Unit for projects with international organizations (PCU). Based on this experience and on the measures the SNC will take with respect to the outsourcing and staffing changes needed to carry out its duties, part of which are included in the PPF, the institutional arrangements on which this operation will be based are considered to meet Bank requirements.

C. Financial feasibility

Table 5.1 – Department revenues from the IEHD – 1999-2003

Projected revenues from the IEHD (in US\$ millions)					
Department	1999	2000	2001	2002	2003
Oruro	4.6	4.8	5.0	5.2	5.4
Potosí	5.9	6.2	6.4	6.7	6.9

Source: UDAPE, with adjusted data from the central government Economic Plan

Table 5.2 – Projected outlays covered by IEHD revenues – 1999-2002

Outlays to be covered by IEHD revenues (in US\$ millions)				
Department	1999	2000	2001	2002
Oruro	4.2	4.4	4.7	5.1
Potosí	5.1	5.6	6.2	6.6

Source: SNC Department of Finance

- 5.8 The assumptions used in preparing the financial projections shown in Table 5.1 were reviewed by the project team and are considered reasonable. The funds that the departments are expected to obtain during the program execution period exceed their expected outlays, which include the local counterpart contribution to works under the program. The law authorizes the TGN to retain and deliver to SNC the IEHD proceeds payable to the departments, for them to use to cover the amounts they must contribute to road projects carried out in their respective jurisdictions. The contract for the proposed loan will include a provision that Bolivia must keep that law in force. A provision will also be included in the agreements entered into by the SNC and the departments that this procedure must be used to ensure timely availability of the local counterpart funding. Moreover, the loan contract will include a condition that the legal provisions allowing automatic debiting by the TGN of the transfers to the departmental governments for local counterpart contributions will remain in force.
- 5.9 The contributions that the department of Oruro will have to make amount to less than 5% of forecast revenues over the period 1999-2002, as indicated in Table 5.1, while for the department of Potosí they are less than 35% of estimated revenues during the same period. In both cases, these demands are not expected to place an undue burden on the departments and can therefore be met without any major problem.
- 5.10 A comparison of data in the tables shows that projected revenues exceed projected outlays during the program execution period. Moreover, those outlays include a

factor of 20% for commitments that the departments could postpone, in the event that revenues should decline.

- 5.11 Because the proposed program has been assigned top priority by the Government of Bolivia and the TGN has the legal authority to withhold IEHD resources and a contractual obligation to exercise this authority, and given that the additional US\$1 million that the TGN will need to allocate during each year of program execution will have only a minor impact on the national budget, the local counterpart contribution for the proposed operation will be available in a timely manner.

D. Socioeconomic feasibility

1. The project

- 5.12 For purposes of the feasibility study, the project was divided into two sections: (i) Ventilla-Yocalla, a 64-kilometer stretch, which involves mountainous terrain; and (ii) Yocalla-Tarapaya, a 23-kilometer stretch, where the topography is hilly. In addition, the program includes upgrading the gravel surface of some 150 kilometers of access roads, which will provide primarily social benefits, principally by affording reliable access to schools, health services and major settlements, that were not quantified.

2. Methodology

- 5.13 The methodology used in evaluating the Ventilla-Yocalla and Yocalla-Tarapaya sections is based essentially on the social surplus approach that stresses assessing savings to road users. The evaluation is based on a comparison of economic costs and benefits, with and without the roadway improvements. The major benefits are considered to lie in vehicle operating cost savings and in travel time savings for passengers. A further benefit that has been quantified is the difference, with and without improvement, in the cost of maintaining the road. This benefit is relatively minor.
- 5.14 In estimating vehicle operating cost savings, the VOC submodel of the World Bank's Highway Design and Maintenance Standards Model (HDM-III) was used, with updated unit figures.
- 5.15 Investment costs were derived from the final engineering studies, net of taxes and other transfers. Similarly, benefits are net of taxes and transfers. Prices are expressed in United States dollars of July 1997, at an exchange rate of Bs. 5.1933 to one U.S. dollar.

3. Principal data

- 5.16 Vehicle counts and origin and destination (O-D) surveys were used in determining the characteristics and volumes of traffic on the highway sections under study. The O-D surveys were taken at two stations, Yocalla and Ventilla, because these were the locations that allowed the greatest possible traffic volume to be surveyed, for which historic traffic data were available, and which had suitable roadside facilities where vehicles could be stopped and surveyed without undue inconvenience to drivers or disruption to traffic. The surveys were conducted at these two stations continuously (24 hours a day) for seven consecutive days, in January and February 1997 and in

April 1997. Four centers – La Paz, Oruro, Tarapaya and Potosí – were found to generate and attract 70% of traffic on the Ventilla-Tarapaya sections.

- 5.17 Observed traffic counts were seasonally corrected to produce an annualized estimate of average daily traffic. Annual growth rates of traffic were estimated using data on the population and GDP in the area of influence of the highway, and applying elasticity coefficients that had been confirmed by previous studies.
- 5.18 The unit values of time savings for vehicle occupants were calculated based on salaries documented by the SNC for bus drivers and guards and truck drivers and assistants, and, for the occupants of light vehicles and bus passengers, on information from the National Statistics Institute (INE) and other comparative studies. Income was divided into two levels: high and low, corresponding to light vehicle and bus passengers, respectively. The values used, US\$1.74 per hour for passengers of light vehicles and US\$0.87 for bus passengers, are similar to those calculated in other countries with comparable levels of per capita income.

4. Results

- 5.19 The economic evaluation of the optimum alternatives for each of the individual sections was conducted on the basis of the costs and benefits described above, including the costs of mitigating any adverse environmental impact. The respective economic internal rates of return (EIRR), net present value (NPV), and cost/benefit ratios (C/B) were determined over a period of 20 years, excluding the construction period. Road maintenance costs were added, for both routine and periodic maintenance, and the salvage value of the works in year 20 of the program was calculated.

Table 5.3 – Results of the economic analysis

Section	Length (km)*	(US\$/km*)	EIRR(%)	NPV	C/B Ratio
Ventilla-Yocalla	62	441,000	15.1	4.5	1.6
Yocalla-Tarapaya	22	531,000	24.9	9.6	2.8
Ventilla-Tarapaya	84	435,000	18.4	14.1	1.9

*at market prices

Source: mission based on consultant's report

- 5.20 The results shown in table 5.3 indicate a higher rate of return for the Yocalla-Tarapaya stretch, where the terrain is more mountainous, than for the Ventilla-Yocalla stretch. Upgrading of the former stretch is therefore considered more critical.

5. Sensitivity analysis

- 5.21 The sensitivity analysis (Table 5.4) for each stretch shows that, even if costs increased by 10% and benefits decreased by a similar proportion, the economic rate of return would remain greater than 12%.

Table 5.4 – Results of the sensitivity analysis

Section	EIRR baseline	Investment + 10%	Benefits -10%	Invest.+10% Ben.-10%
Ventilla-Yocalla	15.1%	13.7%	13.6%	12.2%
Yocalla-Tarapaya	24.9%	23.1%	22.9%	21.1%
Ventilla-Tarapaya	18.4%	16.8%	16.7%	15.2%

Source: mission based on consultant's report

6. Poverty targeting

- 5.22 The Ventilla-Tarapaya-Potosí highway is located in two of the poorest departments in Bolivia, and its upgrading will benefit all the residents of the 18 farming communities located in the direct area of influence of the project, as well as the inhabitants of the city of Potosí. Eleven of the communities are located along the highway, and improvement of the access roads to the more remote communities has been included in the project to allow their inhabitants to reap the benefits the program will generate.
- 5.23 The survey of the inhabitants of the communities located close to the highway, conducted during the detailed survey carried out for preparation of the PRIPA, showed that 92% of the inhabitants qualified as low-income. It can therefore be assumed that most of the inhabitants of these communities, especially the more remote ones, are also low-income groups. According to the Eighth Replenishment document (AB-1704), this project therefore qualifies as a geographically poverty-targeted investment and as such is part of the key area of Bank activity for social equity and poverty reduction.

E. Social and environmental feasibility

- 5.24 The project to upgrade the Ventilla-Tarapaya highway is environmentally feasible, and is of great economic and social importance to the region, which is one of the most depressed in the country. Moreover, it is consistent with Bank guidelines for such projects, and offers some important advantages over previous works. For the first time in a road project for Bolivia, effective public consultations were held with the affected communities during the study and design preparation stage, a PRIPA was prepared according to Bank policies, and the issues of environmental liabilities and hazardous cargos were studied, with findings that are reflected in the environmental control programs and subprograms, duly detailed and quantified, with execution schedules that are compatible with the overall works schedule.
- 5.25 The institutional coordination mechanisms needed for proper execution of the project and implementation of the environmental control programs have also been addressed. The review of the new SNC organizational structure and the recommendations that have been made on this score are designed to ensure greater SNC efficiency in the management of environmental concerns in the transportation sector and, in particular, to strengthen the environment division, which will now have a suitable level in the hierarchical structure.

- 5.26 Moreover, an environmental institutional strengthening component has been included to support implementation of the new SNC structure, and the PPF includes consultants to help the SNC to implement the PRIPA.

F. Benefits

- 5.27 The major beneficiaries of the project to upgrade the Ventilla-Tarapaya highway and feeder roads will be the users of those roads, who will enjoy lower vehicle operating costs. The inhabitants of the project area of influence will also benefit indirectly from an expected increase in transportation services and a possible reduction of freight and passenger charges, greater frequency of passenger service, and reduced travel time to centers where social services are available.
- 5.28 The improvement of local feeder roads, through agreements between the SNC and the departmental governments, under terms and conditions similar to the contracts with private firms, will help the departments adopt business management practices, improve their efficiency, and earn net revenues that can be used for other work on the departmental system. At the same time, it will create opportunities for the SDCs to foster the establishment of microenterprises to which all maintenance work could eventually be outsourced nationwide (paragraph 2.23).
- 5.29 The program will also have a national economic impact through the reduction of highway maintenance costs and lower transportation costs by ensuring better maintenance and passability over the entire basic system, as a result of the more rational and efficient allocation of maintenance resources and the introduction of vehicle weight controls to avoid premature deterioration of pavements.

G. Risks

- 5.30 Although the SNC has experience in the execution of highway upgrading and construction projects similar to that proposed here, it should be borne in mind that, given the institutional instability that the SNC has suffered in the last three years, it has lost much of its most qualified professional and technical personnel, and has been unable to replace them with equally experienced staff because of the low salary levels it now offers. Advisory services and training will be provided through the PPF and the proposed loan, but a medium-term solution will have to come from increases in government salary levels.
- 5.31 Furthermore, the introduction and sustainability of sector planning and road administration systems, such as the medium-term plan, the GIS, the basic information system, maintenance management system, pavement management system, and the vehicle weight control system, will depend on staffing with qualified employees, the appropriate allocation of resources for operating and updating those systems, and the support of the authorities in ensuring that the provisions and recommendations stemming from their use will be respected by road users and by the general public. These shortcomings can be overcome in the medium term through the hiring of consultants and additional technical personnel, financed in part with external resources, but it is essential that both the VMTCAC and the SNC find the means to raise salary scales and hire permanent professional and technical staff needed to ensure continuity for these efforts, and that they secure adequate sources

of financing for this purpose. Accordingly, as a condition of the first disbursement, the borrower will submit a staff strengthening program (paragraphs 2.22 and 3.12), which will be monitored and updated during the periodic program review meetings (paragraph 3.23).

- 5.32 The proceeds from toll collections should be sufficient to cover about 60% of the estimated annual budget for maintenance of the basic highway system during the period 1999-2001 (paragraph 3.14 and Table 3.1). The difference is supposed to be made up through contributions from the TGN, but given the tight fiscal situation it is not likely to happen. During the program execution period, the IDB will contribute part of the funding for periodic maintenance, and the World Bank will finance both routine and periodic maintenance, thereby bringing maintenance coverage to approximately 80% of the annual plans. The government will therefore need to find a way to secure permanent sources of sustainable funding for road maintenance. Under the studies and projects component of the program, resources are included to hire consulting services to assist the Bolivian government in identifying and devising mechanisms designed to ensure permanent sources of funding for road maintenance. Within 24 months after signature of the loan contract, the borrower will submit to the Bank a plan for sustainable financing for road maintenance.
- 5.33 All of the concession initiatives for roadway upgrading, expansion, rehabilitation, and/or reconstruction that involve the stretches that generate the highest toll revenue will have to be carefully analyzed, particularly with respect to their impact on SNC revenues, since they constitute the primary source of funding for routine and periodic maintenance activities throughout the basic system. Concession plans will also be part of the AOPs and will be discussed at the periodic meetings (paragraph 3.23).

LOGICAL FRAMEWORK
IMPROVEMENT PROGRAM FOR THE VENTILLA-TARAPAYA HIGHWAY AND TRANSPORTATION SECTOR SUPPORT
(BO-0098)

PROGRAM	A. PROJECT TO UPGRADE THE VENTILLA-TARAPAYA-POTOSÍ HIGHWAY AND ACCESS ROADS	B. PROJECT FOR MAINTENANCE OF THE BASIC HIGHWAY SYSTEM	C. INSTITUTIONAL STRENGTHENING PROJECT
<p>ce the competitiveness of sectors, in the context of external trade</p>			
<p>E</p> <p>ce the level of service on highways that are part of the basic system and reduce operating costs</p>	<p>GOAL</p> <p>To help improve the level of service on highways that are part of the basic system and reduce operating costs for users</p>	<p>GOAL</p> <p>To help improve the level of service on highways that are part of the basic system and reduce operating costs for users</p>	<p>GOAL</p> <p>To help improve the level of service on highways that are part of the basic system and reduce operating costs for users</p>
<p>MAIN PROJECTS:</p> <p>ect to upgrade and pave Ventilla-Tarapaya-Potosí highway and its access roads</p> <p>aintenance project for the basic highway system</p> <p>stitutional strengthening project</p>	<p>PURPOSE</p> <p>To upgrade the characteristics and structural capacity of the Ventilla-Tarapaya-Potosí highway, through improvement, paving, and rehabilitation works, and to ensure year-round use of its access roads, which will be upgraded to meet proper safety standards.</p>	<p>PURPOSE</p> <p>To introduce more efficient methods for management of system maintenance</p>	<p>PURPOSE</p> <p>To introduce measures for institutional strengthening that will improve system efficiency</p>

PROGRAM	A. PROJECT TO UPGRADE THE VENTILLA-TARAPAYA-POTOSÍ HIGHWAY AND ACCESS ROADS	B. PROJECT FOR MAINTENANCE OF THE BASIC HIGHWAY SYSTEM	C. INSTITUTIONAL STRENGTHENING PROJECT
	<p>COMPONENTS</p> <ol style="list-style-type: none"> 1. Upgrading and paving of 84 km of highway between Ventilla and Tarapaya 2. Reinforcing existing asphalt pavement on the 25 km stretch between Tarapaya and Potosí 3. Upgrading and surface stabilization of 150 km of access roads linking various communities with the Ventilla-Tarapaya section and construction of an 80 m bridge on the access road to Macha 	<p>COMPONENTS</p> <ol style="list-style-type: none"> 1. Routine maintenance under contract, with proper programming and control of activities, through the maintenance management system (SAM) 2. Periodic maintenance of paved sections of the basic system where the need is most urgent 3. Introduce a pavement management system (SGP) for effective monitoring of performance on paved sections 4. Introduce and operate a comprehensive vehicle weight and dimensions control system for freight traffic on the basic system 5. Conduct studies and pilot section experiments on soil stabilization techniques that can reduce maintenance costs for unpaved roads and apply the most effective techniques. 	<p>COMPONENTS</p> <ol style="list-style-type: none"> 1. New organizational structure for the SNC with clearly defined functions and responsibilities implemented 2. SNC organization and operating procedures manuals approved and implemented 3. SNC personnel training activities completed and deemed satisfactory 4. National Transportation Service Planning Office (ONSPT) established with the capacity to operate and maintain mode and regular updating of the Master Transportation Plan 5. Integrated computer network in place so that SNC and VM can process and exchange information between each other and with other parties for purposes of planning, programming investments and managing operations

PROGRAM	A. PROJECT TO UPGRADE THE VENTILLA-TARAPAYA-POTOSÍ HIGHWAY AND ACCESS ROADS	B. PROJECT FOR MAINTENANCE OF THE BASIC HIGHWAY SYSTEM	C. INSTITUTIONAL STRENGTHENING PROJECT
	<p>ACTIVITIES</p> <ol style="list-style-type: none"> 1. Review and approve project designs and bidding documents 2. Issue calls for bids for works and supervision 3. Award contracts for works and supervision 4. Execute works 	<p>ACTIVITIES</p> <ol style="list-style-type: none"> 1. Routine maintenance <ol style="list-style-type: none"> 1.1 Update SAM and review 1999 maintenance plan 1.2 Support supervision contracts 1.3 Conduct periodic surveys and evaluations of the state of repair of the roads 1.4 Evaluate compliance with annual maintenance plans 2. Periodic maintenance <ol style="list-style-type: none"> 1.1 Select sections for periodic maintenance according to SGP criteria 1.2 Conduct bidding procedures and award contracts 1.3 Carry out periodic maintenance as programmed 3. Vehicle weight control <ol style="list-style-type: none"> 1.1 Formulate and implement short-term weight control plan (PCP) 1.2 Develop and implement medium-term plan (PMP) 1.3 Operate comprehensive weight control system for the basic system 4. New methods for stabilizing unpaved roads <ol style="list-style-type: none"> 1.1 Hire consultants for studies 1.2 Select technologies for testing 1.3 Execute experiments on pilot sections 1.4 Evaluate and select most efficient methods 1.5 Apply to maintenance of unpaved network 	<p>ACTIVITIES</p> <ol style="list-style-type: none"> 1. Award advisory services co 2. Award contracts for studies 3. Implement training program 4. Conduct bidding for procur of equipment and software

LOGICAL FRAMEWORK
IMPROVEMENT PROGRAM FOR THE VENTILLA-TARAPAYA HIGHWAY AND TRANSPORTATION SECTOR SUPPORT
(BO-0098)

A. PROJECT TO UPGRADE THE VENTILLA-TARAPAYA-POTOSÍ HIGHWAY AND ACCESS ROADS

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS																								
improve the level of service on that are part of the basic and reduce operating costs for	<p>1.1 By 6/30/2003, operating costs on improved sections will have been reduced as follows:</p> <table><tr><td><u>Ventilla-Yocalla</u></td><td><u>1996</u></td><td><u>2001</u></td></tr><tr><td>Automobiles</td><td>62.5</td><td>30.5</td></tr><tr><td>Buses</td><td>172.5</td><td>122.0</td></tr><tr><td>Trucks</td><td>110.0</td><td>70.5</td></tr><tr><td><u>Yocalla-Tarapaya</u></td><td></td><td></td></tr><tr><td>Automobiles</td><td>64.0</td><td>31.0</td></tr><tr><td>Buses</td><td>232.0</td><td>126.5</td></tr><tr><td>Trucks</td><td>156.0</td><td>73.5</td></tr></table> <p>1.2 By 12/31/2002 travel times between Oruro y Potosí will have been reduced by 30% compared with those recorded in June 1998</p>	<u>Ventilla-Yocalla</u>	<u>1996</u>	<u>2001</u>	Automobiles	62.5	30.5	Buses	172.5	122.0	Trucks	110.0	70.5	<u>Yocalla-Tarapaya</u>			Automobiles	64.0	31.0	Buses	232.0	126.5	Trucks	156.0	73.5	<p>1.1 Measure surface roughness of paved surfaces and apply the VOC submodel from HDM-III, using the same basic parameters and prices as in the 1998 studies.</p> <p>1.2 Measure travel times and survey transportation companies and users at year-end 2002</p>	
<u>Ventilla-Yocalla</u>	<u>1996</u>	<u>2001</u>																									
Automobiles	62.5	30.5																									
Buses	172.5	122.0																									
Trucks	110.0	70.5																									
<u>Yocalla-Tarapaya</u>																											
Automobiles	64.0	31.0																									
Buses	232.0	126.5																									
Trucks	156.0	73.5																									
Performance and structural capacity Ventilla-Tarapaya-Potosí through upgrading, paving, rehabilitation works, and ensure use of access roads under safety conditions	<p>1.1 By 12/31/2002 works are completed and satisfactory and all roads and bridges to be upgraded under the program are in use. These are 109 km of highway between Ventilla and Potosí; a new bridge over the Rio Pilcomayo; 150 km of access roads feeding the highway; and a new bridge on the access road to Macha</p>	<p>1.1 Periodic inspections; progress reports by supervisors of works to upgrade the Ventilla-Tarapaya-Potosí section; progress reports by SNC on access road improvement works; and visual assessment of surface condition and status of improved roads</p> <p>1.2 Official acceptance of works; visual inspections, maintenance and usability reports on access roads, and user surveys</p>	<p>Performance of construction firm the SDCs is satisfactory in execution road improvement works and local communities fulfill their commitment carry out complementary works and contribute to road maintenance.</p>																								

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
<p>OBJECTIVES</p> <p>Rehabilitating and paving of 84 km of roadway between Ventilla and Tarapaya</p> <p>Reinforcement of asphalt paving 25 km of existing roadway between Tarapaya and Potosí</p> <p>Access improvement and rationalization for 150 km of access roads linking various communities in the Ventilla-Tarapaya section</p> <p>Construction of an 80 m bridge on the access road to Macha</p> <p>Disbursement schedule</p>	<p>1.1 By 12/31/2002 improvement works on the 84 km stretch Ventilla-Tarapaya, including the new bridge over the Rio Pilcomayo are completed, with standard geometric characteristics, asphalt surface 7.30 meters wide with 1.50 m shoulders on each side, designed for a useful life of 10 years, and in service</p> <p>2.1 By 12/31/2002 a new asphalt layer is laid to reinforce the 25 km paved stretch between Tarapaya and Potosí, minor repairs have been made, and signage has been standardized with signage on the Ventilla-Tarapaya stretch.</p> <p>3.1 By 12/31/2001 upgrading work has been completed on 150 km of access roads with a standard width of 6 m and a stabilized gravel surface, according to acceptable technical standards; the bridge on the Macha access road has been built; and maintenance practices are in place, pursuant to the SAM recommendations</p> <p>See disbursement schedule</p>	<p>1.1 Official acceptance of works and final supervisor reports</p> <p>2.1 Official acceptance of works and final supervisor reports</p> <p>3.1 Official acceptance of works by the departmental governments and the beneficiary communities</p> <p>Physical and financial progress reports and accounting records from Coordinating Unit</p>	<p>Bidding proceeds normally and on schedule, with no protests</p> <p>Counterpart funds are provided on a timely basis, contractors and service providers are paid on time, and there is no slowdown in the pace of work for such reasons</p> <p>The SDC of Potosí demonstrates that it has the staff and equipment required and the communities agree to carry out complementary works and ensure maintenance of these roads</p>

LOGICAL FRAMEWORK
IMPROVEMENT PROGRAM FOR THE VENTILLA-TARAPAYA HIGHWAY AND TRANSPORTATION SECTOR SUPPORT
(BO-0098)

B. PROJECT FOR MAINTENANCE OF THE BASIC HIGHWAY SYSTEM

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS																		
L help improve the level of service on ways that are part of the basic m and reduce operating costs for	1.1 By 06/30/2003, the state of repair of the basic system, compared with that recorded in June 1998, has changed as follows: <table><tr><td><u>Condition</u></td><td><u>1998</u></td><td><u>2003</u></td></tr><tr><td>Excellent</td><td>1%</td><td>6%</td></tr><tr><td>Good</td><td>19%</td><td>35%</td></tr><tr><td>Fair</td><td>45%</td><td>49%</td></tr><tr><td>Poor</td><td>32%</td><td>10%</td></tr><tr><td>Very poor</td><td>3%</td><td>0%</td></tr></table>	<u>Condition</u>	<u>1998</u>	<u>2003</u>	Excellent	1%	6%	Good	19%	35%	Fair	45%	49%	Poor	32%	10%	Very poor	3%	0%	1.1 Reports produced by the updated and reactivated maintenance management system (SAM), used to plan and oversee outsourced maintenance 1.2 Reports on performance of contracts for periodic maintenance and emergency activities 1.3 Findings of periodic evaluations of the state of repair of the system performed with equipment procured under the program, using SAM and SGP models 1.4 Annual maintenance reports produced by SNC and verifications during the periodic joint reviews by the borrower, the executing agency, and the Bank	Contracts for routine maintenance with priv firms or agreements with the SDCs cover t entire system, remain in force throughout t period, and are executed satisfactorily SNC revenues from tolls, TGN contribution and external financing are sufficient to cover at least 80% of routine and periodic maintenance needs, as well as emergency expenditures Annual maintenance plans are amended in accordance with agreements reached and recommendations made during the periodic reviews
	<u>Condition</u>	<u>1998</u>	<u>2003</u>																		
Excellent	1%	6%																			
Good	19%	35%																			
Fair	45%	49%																			
Poor	32%	10%																			
Very poor	3%	0%																			
POSE duce more efficient methods for gement of the basic highway m	1.1 By 05/01/1999 routine maintenance of the basic system is being performed under contracts with private firms and agreements with the SDCs, in accordance with the annual maintenance plans and SAM criteria 1.2 By 01/01/2001 the SGP is in effect for evaluating performance of paved sections of the basic system and for preparing periodic maintenance and pavement reinforcement programs	1.1 Contracts and agreements signed: monthly progress reports on works prepared; and SAM evaluations and annual reports 1.2 Surveys of the state of repair of paved stretches and findings of periodic evaluations produced by SGP																			

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS																				
	<p>1.3 By 03/01/2001 an effective weight control system is operational to prevent overweight vehicle traffic throughout the basic system</p> <p>1.4 By 01/01/2001 modern soil stabilization techniques are in use for unpaved roads, performance has improved, and maintenance costs have been reduced</p>	<p>1.3 Field inspections, daily records from control posts and consolidated reports from the integrated weight control system</p> <p>1.4 Standards for maintenance of unpaved roads incorporating new soil stabilization techniques; findings of assessments of state of repair of unpaved roads and average maintenance costs</p>																					
<p>COMPONENTS</p> <p>Routine maintenance performed under contract, with proper programming and control of activities, through the maintenance management system (SAM)</p>	<p>1.1 By 04/30/1999 the SAM has been updated and is in use for reviewing, programming, and controlling the 1999 maintenance plan</p> <p>1.2 By 05/01/1999 contracts or agreements are in place to ensure performance of activities called for under the plan</p> <p>1.3 By 12/31 of each year during 1999/2001, the annual maintenance plans are fulfilled to at least the following percentages:</p> <p style="padding-left: 40px;"> 1999 – 70% of plan 2000 – 80% of plan 2001 – 90% of plan </p>	<p>1.1 New SAM model implemented in SNC and maintenance plan updated</p> <p>1.2 Contracts and agreements signed; progress reports on programmed routine maintenance work; and periodic reports produced by SAM</p>	<p>Toll revenues, TGN allocations, and external loans received by SNC are maintained at levels required under annual maintenance plans, estimated at no less than:</p> <p><u>revenues in US\$ millions</u></p> <table> <tr> <th><u>Source</u></th><th><u>1999</u></th><th><u>2000</u></th><th><u>2001</u></th></tr> <tr> <td>Tolls</td><td>13.0</td><td>12.3</td><td>13.0</td></tr> <tr> <td>TGN</td><td>0.4</td><td>0.6</td><td>0.4</td></tr> <tr> <td>Bank (BO-0098)</td><td>1.5</td><td>3.8</td><td>1.5</td></tr> <tr> <td>World Bank</td><td>3.3</td><td>2.0</td><td>4.0</td></tr> </table>	<u>Source</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	Tolls	13.0	12.3	13.0	TGN	0.4	0.6	0.4	Bank (BO-0098)	1.5	3.8	1.5	World Bank	3.3	2.0	4.0
<u>Source</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>																				
Tolls	13.0	12.3	13.0																				
TGN	0.4	0.6	0.4																				
Bank (BO-0098)	1.5	3.8	1.5																				
World Bank	3.3	2.0	4.0																				
<p>Periodic maintenance carried out on paved sections of the basic system where needs are most urgent</p>	<p>2.1 By 09/30/2000 periodic maintenance has been performed on no less than 350 km of the basic system</p>	<p>2.2 Official acceptance of works and final supervisory reports</p>	<p>Studies for selecting and contracting works on target sections are conducted on schedule, and the performance of firms hired to carry out periodic maintenance work is satisfactory</p>																				

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
Pavement management system in place to ensure effective monitoring of performance of paved sections	<p>3.1 By 10/31/1999 the principle criteria are established for the system and the model is in place for evaluating performance of paved sections of the basic system</p> <p>3.2 By 03/01/2000 procedures have been established and funding secured for measurement and periodic evaluations of the paved roads, as required for ongoing operation of the pavement management system</p>	<p>3.1 Testing of the model installed in SNC and personnel trained to operate and maintain it</p> <p>3.2 Equipment for survey and evaluation of paved sections procured; personnel trained to operate and maintain it; logistic support available and included as a permanent expense of SNC</p>	
Integrated weight and dimensions control system in place and operating for freight traffic over the basic system	<p>4.1 By 04/30/1999 temporary weight control stations are operating as per the short-term plan, controlling sections of the basic system that are most exposed to overweight traffic</p> <p>4.2 By 01/01/2001 permanent weight control sections are built, equipped and operating as called for in the medium-term plan, covering the entire basic system</p>	<p>4.1 Field inspections; weigh station records; and reports from the responsible SNC unit</p> <p>4.2 Field inspections; official acceptance records; invoices; weigh station operating records; and periodic reports from the integrated weight control system</p>	<p>The medium-term plan is executed on schedule and lands are available for timely installation of permanent weight control stations</p> <p>The NDF loan is approved as expected and weight control equipment is purchased with proceeds</p> <p>There are no delays with respect to public services and communication connections to the weigh stations</p>
Studies performed and pilot stretch experiments completed for applying soil stabilization techniques to reduce maintenance costs for unpaved roads, and the most efficient techniques introduced	<p>5.1 By 03/01/2001 approximately 50 km of experimental stretches have been evaluated</p>	<p>5.1 Final reports on the experimental stretches; consultants' evaluations and recommendations</p>	<p>Results from experimental stretches are conclusive and the most effective methods are found to be economically efficient</p>

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
	5.2 By 04/01/2001 the methodologies selected from the experimental stretches have been incorporated into the SNC maintenance standards for unpaved roads	5.2 Standards updated and new techniques applied in maintenance programs	
ACTIVITIES execution schedule	See disbursement schedule	Physical and financial progress reports and accounting records from the Program Coordination Unit	

LOGICAL FRAMEWORK
IMPROVEMENT PROGRAM FOR THE VENTILLA-TARAPAYA HIGHWAY AND TRANSPORTATION SECTOR SUPPORT
(BO-0098)
INSTITUTIONAL STRENGTHENING PROJECT

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
<p>GENERAL</p> <p>Help improve the level of service on highways that are part of the basic system and reduce operating costs to the Government</p>	<p>1.1 By 12/31/2000 the SNC has sufficient, duly trained personnel to administer and supervise road maintenance contracts and to operate the toll collection, weight control, maintenance administration, and pavement management systems</p> <p>1.2 By 12/31/2001 the firms hired for road maintenance (including the SDCs) and SNC supervisory personnel have gained broad experience in executing the annual maintenance plans</p> <p>1.3 By 06/30/2002 the SNC has information and control systems in place to allow better use of maintenance funds for the basic system</p>	<p>1.1 Evaluation of operating results from the detailed training program</p> <p>1.2 Degree of compliance with execution goals of the annual maintenance plans</p> <p>1.3 Detailed statistics on the basic highway system and reduced maintenance costs per km</p>	<p>The training program is in effect as planned and the training methods recommended are feasible and produce satisfactory results</p> <p>Selection of training candidates is done through a fair and rational process</p> <p>Trained personnel perform with interest and dedication and do not leave for other institutions or the private sector in the short term</p> <p>A clearly defined incentives and merit-based promotion policy is adopted to retain the most competent staff members</p>
<p>SPECIFIC PURPOSE</p> <p>Introduce institutional strengthening measures that will enhance the efficiency of the sector</p>	<p>1.1 By 12/31/2000 procedures have been streamlined, turnaround times reduced, and efficiency improved in procurement procedures, reviewing and approval of studies, issuing of payment certificates, procedures for processing statistical data, and production of executive reports</p>	<p>1.1 Evaluations performed during the periodic reviews with participation by the borrower, the executing agency, and the Bank</p>	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
<p>COMPONENTS</p> <p>The new SNC organization structure is in place, with clearly defined functions and responsibilities</p> <p>SNC organization and operating procedures manuals approved and in force</p> <p>Staff training program completed</p> <p>Establishment of ONSPT with the capacity to operate and maintain models for regular updating of the Master Transportation Plan</p>	<p>1.1 By 07/31/1999 functions and responsibilities have been defined for the various management levels and staff of the SNC, consistent with their respective spheres of competence and duties</p> <p>1.2 By 06/30/2000 professional staff have been reassigned, trained or hired as needed to fill key positions in SNC operations, in accordance with the new structure, and in the ONSPT under the VMTCAC</p> <p>2.1 By 01/01/2000 SNC operating procedures have been amended, in line with the new manuals</p> <p>3.1 By 12/31/2000, no less than: (i) 70% of senior and mid-level managers of SNC have received training in specific aspects relating to their duties, so as to improve their managerial skills; (ii) 50% of mid-level managers and support staff have received training that will equip them to take on new duties; and (iii) 30% of support staff have been trained in using computers and office equipment or in operating engineering and laboratory instruments so that they can function in areas of greater specialization</p> <p>4.1 By 06/01/1999 the Master Transportation Plan has been approved; the ONSPT has suitable personnel to run the models; information capture mechanisms are in place; and a database is available for regular updating of the Plan</p>	<p>1.1 Approval issued by the SNC Office of the Director General</p> <p>1.2 List of personnel and assignment decisions, appointments and contracts approved by the Office of the Director General of the SNC or VMTCAC, as appropriate</p> <p>2.1 Verification of procedures by sampling</p> <p>2.2 Results of surveys of employees, contractors and suppliers of goods and services</p> <p>3.1 Records and evaluations of courses, seminars, technical visits and other training activities</p> <p>3.2 Certificates from universities and specialized technical institutes, proof of participation in seminars and short training courses, etc.</p> <p>3.3 Surveys of beneficiaries</p> <p>4.1 Final version of Master Transportation Plan approved</p> <p>4.2 Studies and statistical information produced by ONSPT</p>	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
The integrated computer network is in place, allowing SNC and VMTCAC to process and exchange, among themselves and with others, statistical information as required for their planning, investment programming, and operations management activities	5.1 By 06/30/2002, no less than 70% of SNC administration and control operations are done through systems linked to the integrated computer network; and no less than 80% of technical tasks use modern computer and communications systems	5.1 Inspections and demonstrations of system operation during periodic reviews 5.2 Reports and other output obtained through the systems installed	
ACTIVITIES execution schedule	See disbursement schedule	Physical and financial progress reports and accounting records from the Program Coordination Unit	

PROCUREMENT PLAN							
DESCRIPTION	Type of supplier	Number of contracts	Type of bidding	Source of funds	Date of notice (quarter and year)	Initiation date	Cost in US\$ x 1000
1. CONSULTING SERVICES							
Support for PCU	Individual	several	L.P.	IDB/LOC	II/1999	III/1999	250
Studies and projects	Firm/Indiv	several	I.P./L.P.	IDB/LOC	IV/1999	II/2000	3,000
Road works supervision	Firms	2	I.P.	IDB/LOC	I/1999	I/2000	2,300
Maintenance supervision	Individual	several	L.P.	IDB	III/1999	IV/1999	80
Building supervision	Individual	several	L.P.	LOC	III/1999	IV/1999	20
Env. Management training	Individual	several	L.P.	IDB/LOC	IV/1999	II/2000	100
Miscellaneous training	Various	several	L.P.	IDB/LOC	III/1999	I/2000	300
Pavement Management System	Firm/Indiv	2	I.P.	IDB/LOC	IV/1999	II/2000	6,500
Unpaved road stabilization	Individual	1	I.P.	IDB/LOC	I/2000	II/2000	120
Monitoring and env. Protection	Individual	1	I.P.	IDB/LOC	IV/1999	III/2000	1,200
2. CIVIL WORKS							
Improvements, Ventilla-Tarapaya	CONT	2	ICB	IDB/LOC	I/1999	I/2000	31,200
Reinforce pavement, Tarapaya-Potosí	CONT	1	ICB	IDB/LOC	III/2001	I/2002	1,700
Periodic maintenance	CONT	several	ICB	IDB/LOC	III/1999	IV/1999	4,000
Buildings and restoration	CONT	several	LCB	LOC	III/1999	IV/1999	2,400
3. PROCUREMENT OF EQUIPMENT							
Eng. & Pavement evaluation equip.	SUPP	several	ICB	IDB/LOC	III/1999	I/2000	150
Traffic safety equipment	SUPP	several	LCB	IDB/LOC	III/1999	I/2000	100
Comput. and Communic. equip.	SUPP	several	ICB	IDB/LOC	III/1999	I/2000	1,200
Laboratory equipment	SUPP	several	LCB	IDB/LOC	II/1999	III/1999	100

L.P. = Local proposals
 I.P. = International proposals
 ICB = International competitive bidding
 LCB = Local competitive bidding

CONT = Contractors
 SUPP = Suppliers
 Firm. = Consulting firms
 Indiv. = Individual consultants
 LOC = Local counterpart

CESI RECOMMENDATIONS

1. To ensure that any adverse environmental impact is adequately mitigated, it is recommended that the loan contract include the following clauses:
2. Prior to the first disbursement, the Bank must receive evidence that:
 - a. the agreement between the National Road Administration (SNC) and the Departmental Government of Potosí has been signed, specifying in detail the activities to be performed for implementing the Compensation and Resettlement Plan (PRIPA), a detailed timetable for its implementation and a cost breakdown; and
 - b. the new structure of the SNC has been approved, taking into account the Bank's recommendations for handling environmental issues.
3. Before the start-up of construction work is authorized on sections that involve human relocation or resettlement, the Bank must receive evidence that the relocation/resettlement process has been conducted in an appropriate and timely manner, in accordance with the schedule set out in the PRIPA.
4. Before a call for bids is issued for each section of the project works, the executing agency must submit to the Bank evidence that: (i) the recommended environmental control measures have been included in the respective bidding documents; and (ii) the environmental permits and licenses required under national legislation have been obtained.
5. Project progress reports must include the status of implementation of all the recommended environmental control measures.
6. The SNC works acceptance committee must retain the services of an environmental expert, who can certify that all the environmental control measures have been adequately implemented by the contractor. Such certification will be a condition for release of the contractor's performance bond.
7. The consulting firm responsible for supervising the civil works must have an environmental expert among its staff assigned to the project.
8. If operating, maintenance or administration services for the highway are concessioned to the private sector, the bidding documents must include identification and management of environmental liabilities, and must set out the responsibilities of the concessionaire to avoid creating any environmental liabilities.

PROPOSED RESOLUTION

BOLIVIA. LOAN ___/SF-BO TO THE REPUBLIC OF BOLIVIA
(Improvement of the Ventilla-Tarapaya Highway and Support to the Transportation Sector Program)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Bolivia, as borrower, for the purpose of granting it a financing to cooperate in the execution of an Improvement of the Ventilla-Tarapaya Highway and Support to the Transportation Sector Program. Such financing will be for the amount of up to US\$52,000,000, or its equivalent of other currencies, except that of Bolivia, from the resources of the Fund for Special Operations of the Bank, and will be subject to the "Terms and Financial Conditions" and the "Special Contractual Conditions" set forth in the Executive Summary of the Loan Proposal. .