

BOLIVIA

**NORTHERN CORRIDOR HIGHWAY PROGRAM,
LA PAZ - CARANAVI SEGMENT**

**IIRSA
RIO BRANCO - LA PAZ HUB**

(BO-0200)

LOAN PROPOSAL

This document was prepared by the project team consisting of Rafael Acevedo (RE1/FI1), Project Team Leader; Mario Durán (RE1/FI1); Enrique Sossa (COF/CBO), Rosana Brandão (RE1/FI1); Paula Giraldez (LEG/OPR); Sergio Mora (COF/CBO); Arcindo Santos (RE1/SO1); Almudena Carrasco (RE1/FI1); Pablo Guerrero (RE1/FI1); Juan Antonio Ketterer (RE1/FI1); Carlos Arango (Consultant); Hadda Muñoz (Consultant); Juan Manuel Campana (Consultant); Carmen Polo (Consultant); Edwin Piedra (Consultant); and Sergio Sáenz (Consultant) and Ricardo Bellver (Consultant) who helped to produce this document.

PROJECT SUMMARY

BOLIVIA

NORTHERN CORRIDOR HIGHWAY PROGRAM,

LA PAZ - CARANAVI SEGMENT

IIRSA RIO BRANCO-LA PAZ HUB

(BO-0200)

Financial Terms and Conditions ¹				
Borrower: Republic of Bolivia			Amortization period:	40 years
Guarantor: Republic of Bolivia			Grace period:	10 years
Executing agency: Servicio Nacional de Caminos [National Roads Service]			Disbursement period:	6.5 years
Source	Amount	%	Interest rate:	1% during grace period, 2% thereafter.
IDB (FSO)	US\$33,148,000	80	Inspection and supervision fee:	1%
Local	US\$8,287,000	20	Credit fee:	0.5%
Total	US\$41,435,000	100	Currency:	Those forming part of the FSO, except the Bolivian currency
Project at a glance				
<p>Project objective:</p> <p>The general objective of the program is to enhance national integration and in particular to integrate the people in the departments of Beni and Pando more effectively with the department of La Paz in the western part of Bolivia. The focus will be on road safety, guaranteeing mobility by keeping the corridor permanently transitable, and promoting on a sustainable basis the economic development of the northern region and its integration with the rest of the country. The program's specific objectives are as follows: (i) to reduce the frequency of road closures and thus shorten journey times on the La Paz-Santa Bárbara segment; (ii) to reduce vehicle operating costs by guaranteeing transit on the new road; (iii) to reduce the number of traffic accident victims; (iv) to reduce corridor conservation costs; (v) to increase transitivity throughout the year and in all weather conditions; and (vi) to repair the socioenvironmental damage caused by construction of the Cotapata-Santa Bárbara highway.</p> <p>Special contractual conditions:</p> <p>In addition to the general contractual conditions of loans with the Bank, the following conditions precedent to the first disbursement will apply: (i) signing and entry into force of the agreement between the SNC and the Municipio of Coroico, on terms agreed with the Bank, for maintenance of the road giving access to the community of El Chairo; and (ii) signing and entry into force of the management contract between the SNC and the Ministry of Finance, including the timetable and resource commitment date.</p> <p>The following special conditions on program execution will also apply: (i) establishment of the PCU and appointment of its coordinator and at least two of its members, prior to award of the La Paz-Cotapata highway rehabilitation contract; (ii) establishment of the Reserve Fund for Conservation and precedent to disbursement of the advance for startup of the contract: initial payment into that fund, prior to award of the contract for stabilization works on the Cotapata-Santa Bárbara segment, and hazard management and road conservation in the La Paz-Santa Bárbara section; (iii): implementation of the solution proposed by the Social Compensation Plan (Yolosa), prior to award of the contract for final design of the Santa Bárbara-Caranavi segment; and (iv) the SNC will make annual payments to the Reserve Fund for Conservation equivalent to US\$400,000 per year, using resources obtained from the National Highway Conservation Account; and it will present to the Bank, no later than 31 August each year, a voucher verifying the corresponding payment to the account of the Reserve Fund for Conservation, issued by the Central Bank of Bolivia (paragraphs 3.22 and 3.23).</p> <p>Exceptions to Bank policies: None.</p>				
<p>Project consistent with country strategy: Yes [X] No []</p> <p>Project qualifies as: SEQ [No] PTI [No] Sector [] Geographic [] Headcount []</p> <p>Verified by CESI on: 15 October 2004</p> <p>Environmental and social review: 4 June 2004</p> <p>Procurement: 3.13 and 3.14</p>				

CONTENTS

I.	FRAME OF REFERENCE.....	1
A.	Socioeconomic setting	1
B.	The transport sector in Bolivia	1
C.	The country's strategy in the sector	3
D.	The Bank's experience and lessons learned	4
E.	The Bank's sector strategy and rationale for its participation.....	5
F.	Coordination with other development finance institutions	6
G.	Support for the IIRSA process	6
II.	THE PROGRAM	8
A.	Objectives	8
B.	Program description.....	9
1.	Component 1. Rehabilitation of the La Paz-Cotapata segment	9
2.	Component 2. Stabilization works on the Cotapata-Santa Bárbara segment; hazard management and road conservation on the La Paz-Cotapata-Santa Bárbara section.....	10
3.	Component 3. Design for improvement of the Santa Bárbara-Caranavi segment.....	13
4.	Component 4. Social compensation and road safety	14
5.	Component 5. Institutional strengthening.....	15
C.	Cost and financing	16
III.	PROGRAM EXECUTION.....	18
A.	Borrower, guarantor and executing agency	18
B.	Project execution and management.....	18
C.	Execution and disbursement timetable	20
D.	Procurement of goods and services.....	21
E.	Monitoring and evaluation.....	21
F.	Ex post evaluation.....	22
G.	Audits.....	22
H.	Loan conditionalities.....	22
1.	Special conditions for program execution.	23
IV.	VIABILITY AND RISKS.....	24
A.	Institutional viability	24
B.	Socioeconomic viability	24
C.	Financial viability.....	25
1.	Prefecture of La Paz.....	26
2.	National Roads Service.....	28
D.	Technical viability.....	29
E.	Social and environmental viability.....	30
F.	Environmental and social impacts, and proposed measures	31

G. Benefits and beneficiaries.....	32
H. Risks	33

Proposed resolution

Electronic Links and References	
Abbreviations	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=422958
Basic Socioeconomic Data	http://www.iadb.org/res/index.cfm?fuseaction=externallinks.countrydata
Status of loan in execution	http://ops/iidbloans/
Information available in the RE1/FI1 technical files	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=422965
Logical framework	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=422968
Procurement plan	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=422971
Map 1	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=352188
Map 2	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=352190

I. FRAME OF REFERENCE

A. Socioeconomic setting

- 1.1 The wide-ranging reform program implemented since 1985 enabled Bolivia to obtain external financing in the form of assistance and foreign investment, thereby generating a climate of economic stability characterized by low rates of inflation (around 8% per year) and steady economic growth. GDP grew by more than 4% per year on average in 1990-1998. Since then, however, following nearly two decades of adjustment, economic growth has faltered, and social conflicts fueled by unemployment and exchange-rate policies that pushed industry into recession, have put the economic model and the country's governance at risk. GDP expanded at a relatively modest 1.8% per year between 1999 and 2003; and the recession of the last four years has led to the reappearance of a contractionary income trend that characterized the pre-reform years of the mid-1980s.
- 1.2 In the macroeconomic domain the fiscal situation has deteriorated sharply—despite public-sector reforms, access to highly concessional financing, and external debt relief successfully negotiated by the authorities and supported by the international financial community.¹ The upward trend in the fiscal deficit, which in 2002 reached a level of 8.9% of GDP, shows that the fiscal situation in Bolivia is unsustainable; and this hinders the creation of an environment that would stimulate economic growth, private investment, and job creation.
- 1.3 There are also clear geographic, social and productive disparities, the persistence of which restricts the country's economic and social progress. In order to reduce these inequities and take advantage of Bolivia's strategic position at the center of the South American continent, it is essential to implement one of the measures proposed in the Bolivian government's development plan, namely road links throughout national territory and integration with neighboring countries in a network of international-standard highways. The Interoceanic and North-South corridors have a major role in this strategy.²

B. The transport sector in Bolivia

- 1.4 Although Bolivia shares borders with several South American countries, shortcomings in the transport system have made it hard for the country to maintain land connections with its neighbors and main trading partners, thereby preventing it from offering competitive prices on the region's product and natural resource

¹ Debt relief through the Heavily Indebted Poor Countries (HIPC) initiative allows for a 60% reduction in the balance of external public debt in net present value terms, thereby releasing external resources on the order of 1 percentage point of GDP over the next 15 years.

² The Northern Corridor forms part of the North-South Corridor, which runs from the border with Brazil at Guayaramerín, through Riberalta, Rurrenabaque, Caranavi and La Paz, before continuing southwards via Oruro, Potosí, and on through Tarija to the border with Argentina.

markets (timber, sulfur, and other raw materials). Concentration of productive activities has generated a disorganized structure lacking in intermediate storage and marketing centers, compounded by deficient utilization of natural resource potential.

- 1.5 Of Bolivia's total road system amounting to some 55,000 km, roughly 11,800 km form part of the fundamental road network (RVF); and of these, 4,058 km are expected to be paved by late 2004. The country's main transport arteries consist of the highway connecting the cities of La Paz and Oruro with Cochabamba and Santa Cruz; the Santa Cruz-Trinidad link; and part of the southern corridor towards Argentina. These account for 76% of the RVF and virtually all of the country's paved roads. The Department of Pando, the Beni plain, the area north of La Paz, and parts of Chiquitania and Chaco have few road links with the rest of the country, and sparse coverage in relation to their territorial area.
- 1.6 The road system in Bolivia is managed by bodies at various hierarchical levels, each with responsibility for a subsystem associated with the category of roads comprising it.³ The National Roads Service (SNC) is a decentralized institution attached to the Ministry of Services and Public Works, with its own legal and administrative status, its own equity and assets, autonomous technical and administrative management, and full powers to engage in any legal action needed for it to function properly. Historically, the SNC has carried out RVF maintenance through direct administration; but since decentralization in June 1996, the institution has transferred responsibility for administration, construction, and maintenance of the country's complementary road network to the Prefecture Road Services (SEPCAM) within their respective jurisdictions. At the present time there are 10 departmental offices with responsibility for the whole of this network. The SNC faces a number of difficulties in achieving its goals, basically stemming from political interference, deficient information, lack of reliable funding, and an inadequate distribution of existing resources.

³ Executive Decree 25.134 of 21 August 1998 (in force since 1999) established three categories in the country's road network: (i) the Fundamental Network (an SNC responsibility); (ii) Prefecture or Departmental Networks (run by the prefectures through SEPCAM); and (iii) Municipal Networks (which are a municipal responsibility).

A Fundamental Network comprises of roads that have a national integration function, connecting departmental capitals and neighboring countries, and forming part of the Pan-American Highway system, with access to the major centers (development hubs). Roads in this network are also strategically important for national defense.

A Prefecture Network consists of roads of regional integration that link major population settlements with departmental capitals and also connect with other transport systems and neighborhood roads. They thus facilitate access to regional development centers, departmental integration with centers of consumption, and linkage between provincial capitals and the departmental capital.

A Neighborhood Network (also known as collector network) consists of roads that feed into the fundamental and complementary networks, connecting rural populations, communities, or production centers between provincial capitals, and the latter in turn with departmental capitals. Road surfaces may be paved, gravel, or dirt.

- 1.7 The 2000 Transport Master Plan (PMT) identified the following main problems affecting Bolivia's road system: (i) deficient maintenance of the road network, which impairs transitivity and continuous accessibility throughout the year, given the insufficient budget available to highway organizations; (ii) lack of an adequate system of network planning and programming; (iii) projects with long execution periods and major cost overruns; and (iv) lack of network connectivity. To solve the first of these problems, the Bolivian government has started to take specific steps such as outsourcing the maintenance function (paragraph 1.8); creation of the National Conservation Account (paragraph 1.9); and restructuring and strengthening of the SNC, which has already been completed (paragraph 1.19). Nonetheless, the network continues to suffer from deficiencies such as road surfaces that are in poor condition, high transport costs, and a lack of bridges on gravel and dirt roads. In addition, there is low demand for road use, except in segments close to the major cities. The volume of traffic on the main road network ranges from 200 vehicles per day on unpaved roads, to 1,000 on paved ones.
- 1.8 The SNC Strategic Action Plan 2000-2002 implemented routine maintenance through the Conservation Program with Microenterprises and Road Managers (PROVIAL-BOLIVIA), financed by the Andean Development Corporation (ADC), which uses microenterprises employing unskilled labor for the maintenance and cleaning of gutters, culverts, and road surfaces. Although this program has achieved significant social benefits for the country, it is insufficient on its own for routine maintenance of the RVF.
- 1.9 World Bank operation 3630-BO (Road rehabilitation and maintenance) is currently being executed, to address outstanding problems in routine maintenance and conservation of the Fundamental Network, and solve technical difficulties arising in transfers from the General Treasury for this purpose. The operation's objectives include prioritization of certain segments of the primary road network, refurbishment of parts of this network, financing of the National Highway Conservation Account, and provision of technical assistance. The above-mentioned account, one of whose main aims of which is to make maintenance sustainable, is financed from road tolls and the Hydrocarbons Tax.

C. The country's strategy in the sector

- 1.10 The Northern Corridor forms part of the Highways Plan of the Vice-Ministry of Transport (VMT),⁴ which seeks to facilitate international freight and passenger transport through Bolivian territory, providing suitable levels of service based on the potential for private-sector participation in the management of highway infrastructure. This conception gives rise to the "Bolivia Plan" which envisages

⁴ The concepts of the Land Transport Master Plan (PMTS), developed in 1996, were used for preparation of a highways plan by the former Vice-Ministry of Transport, Communications and Civil Aviation (VMTAC) in 2002, and in the 2003-2007 Highway Investment Program, prepared by the SNC.

major investments in highway infrastructure mostly concentrated in the North-South Corridor; and it also seeks to consolidate the Interoceanic Corridors that traverse Bolivia from east to west, and the Southern Corridor that links Paraguay and Chile through Tarija and Potosí. While recognizing the constraints that exist in financing the plan, the government intends to prioritize the segments it considers of greatest socioeconomic impact and importance for the country's integration. This program is consistent with those priorities.

D. The Bank's experience and lessons learned

- 1.11 The Bank's participation in funding road sector projects, against a backdrop of financial constraints and both operational and institutional problems, has not always yielded the expected results. Since 1990, six loans amounting to US\$382 million have been approved for the transport sector, of which US\$280 million have been disbursed thus far. Eighteen technical cooperations were also approved during the same period, totaling US\$6.16 million.
- 1.12 The Bank has participated in the Northern Corridor in five operations with the SNC as executing agency, and this has afforded permanent interaction between the Bank and that institution. Loan 445/SF-BO⁵ financed construction of the La Paz-Cotapata highway, and was concluded in March 1983. The Quiquibey-Yucumo segment was financed by the operations 483/OC-BO and 755/SF-BO,⁶ execution of which ended in April 1992. The Cotapata-Santa Bárbara segment was built with the proceeds of loans 698/OC-BO and 893/SF-BO,⁷ the final disbursement of which was made in January 2004.⁸ Other recent highway projects include reconstruction work on the Confital-Caihuasi section (549/OC-BO), the Cochabamba-Chimoré and Guabirá-Yapacaní highway, which forms part of the Cochabamba-Santa Cruz corridor (527/OC-BO), and the Patacamayo-Tambo Quemado highway (840/OC-BR). Although in most cases all components have been implemented as planned, a common feature of these projects has been the need to extend their execution deadlines, because of delays in fulfilling conditions precedent to the first disbursement. In all the projects mentioned (except for the Cotapata-Santa Bárbara and Guabirá-Yapacaní segments, both of which pass through fractured and geologically complicated areas) the main roadwork components have been accomplished within the established timeframes, whereas other components, such as maintenance and various elements of institutional strengthening, have had to prolong their execution periods.

⁵ 445/SF-BO: BO-0022. La Paz-Cotapata highway, and bridges on the La Paz-San Borja route.

⁶ 483/OC-BO and 755/SF-BO: BO-0140. National Transport Program.

⁷ 698/OC-BO and 893/SF-BO: BO-0090. Beni-Peruvian Border Integration Corridor.

⁸ Since 1994, US\$150 million have been invested in construction of the Cotapata-Santa Bárbara segment, of which 44.4% was financed by the Bank, 20.8% by KfW, 13.9% by the ADC, and the rest through local counterpart funding.

- 1.13 The lessons learned from the various projects undertaken in Bolivia⁹ lead to the following specific recommendations: (i) produce detailed engineering studies to avoid delays and reduce cost overruns; (ii) make realistic estimates of project execution times; (iii) keep construction components separate from those relating to rehabilitation, maintenance, and conservation in new civil works, given the different nature of the tasks involved; (iv) keep the number of components to a minimum, in order to facilitate execution and monitoring, particularly when components are not intrinsically and closely linked to the objective of the operation, or the agents responsible for their implementation are dispersed; (v) minimize the number of conditions precedent to the first disbursement; and (vi) ensure adequate technical support and monitoring for program preparation. The project team has sought to incorporate these recommendations into the design of this operation.

E. The Bank's sector strategy and rationale for its participation

- 1.14 The Bank's strategy with Bolivia, set out in the Country Document, aims to reduce the geographic, social, and productive disparities that fragment Bolivian society, the persistence of which restricts the population's economic and social progress.
- 1.15 The Country Strategy (GN-2313) prioritizes the need to "regain economic growth and support sustainable productive development," for which it calls for a revival of public investment in productive infrastructure and reduction of environmental hazards. Program BO-0200 contributes to both of these aims. High transport costs hinder the development of areas with export potential and capacity for tourism development; and on this point, the project seeks to expand job and income-generating opportunities, as the road network integrating Bolivia with neighboring countries spreads.
- 1.16 The Bank's action in the transport sector also aims to enhance integration between the various regions of Bolivia and with neighboring countries, supporting the provision of basic infrastructure to facilitate access to health and education services and regional markets, thereby also helping to raise productivity. In this regard, the Bank is supporting the country through projects to expand and improve the national road network, by financing initiatives to develop lower-ranking road networks with small traffic flows.
- 1.17 Bank intervention is needed to: (i) help integrate Bolivia's land area; (ii) ensure that the environmental hazards caused by construction of the Cotapata-Santa Bárbara highway are suitably repaired (paragraph 2.3); (iii) keep the main access route to the north of the country in optimal condition; and (iv) guarantee the sustainability of Bolivia's highway investment and assets.

⁹ PCRs for the following programs: BO-0051, Rehabilitation of the Cochabamba-Santa Cruz highway; BO-0106, Patacamaya-Tambo Quemado highway; and BO-0126, Confital-Caihuasi highway.

F. Coordination with other development finance institutions

- 1.18 Several other international agencies are also active in the highway infrastructure sector, such as the World Bank, the ADC, the European Community, and BNDES, in addition to bilateral assistance organizations such as USAID. Over the last nine years there has been full coordination between the Bank, the ADC, and KfW of Germany, which jointly funded the Cotapata-Santa Bárbara highway. The ADC is currently financing the paving of that road, which was not included in the original IDB-ADC-KfW operation, as well as the solution of geotechnical instability problem at kilometers 35-36.
- 1.19 The National Highway Service (SNC) has undergone an institutionalization process supported by the World Bank (paragraph 2.30), which has brought stability and a quality technical level to the institution, despite budgetary and staffing constraints.
- 1.20 The World Bank has also provided support for creation of the National Highway Conservation Account (paragraph 1.9) as part of the effort to underpin maintenance of Bolivia's fundamental road network. For this operation, discussions have been held with the government and the World Bank to support an initiative to guarantee maintenance of the zone covered by the program.

G. Support for the IIRSA process

- 1.21 The Initiative for the Integration of Regional Infrastructure in South America (IIRSA), supported by the Bank, the ADC, and FONPLATA (Fondo Financiero para el Desarrollo de la Cuenca del Plata), is gaining in importance every day and eliciting increasing support from the region's various countries. Bolivia is in a strategic position given its privileged location at the center of the continent, since the main physical integration routes necessarily pass through it.
- 1.22 During discussions currently being held with the regional authorities, the IIRSA has defined a series of priority integration hubs and identified potential projects to support the initiative. The Northern Corridor Program (see map¹⁰) forms part of the IIRSA's Rio Branco-Cobija-Riberalta-Yucumo-La Paz axis, and is seen as one of the key projects of the Peru-Brazil-Bolivia hub.
- 1.23 The Northern Corridor will provide interconnection between the state of Acre in Brazil, and the departments of Pando in Bolivia and Madre de Dios in Peru, thereby opening up development prospects for a broad area of the Amazon zone in three countries. In addition to this operation, the Bank is conducting a strategic environmental assessment for the entire Northern Corridor with contributions from the Japan Special Fund, and the Fund for Special Operations. This study will provide strategic guidelines for development of the northern part of Bolivia, and

¹⁰ Mapa del Corredor Norte [Map of Northern Corridor].

will identify priority investments needed to support the integration process. The segments earmarked for intervention under this program form part of the Northern Corridor.

II. THE PROGRAM

A. Objectives

- 2.1 The general objective of the program is to enhance national integration and in particular to integrate the people in the departments of Beni and Pando more effectively with the department of La Paz in with the western part of Bolivia. The focus will be on road safety, guaranteeing mobility by keeping the corridor permanently transitable, and promoting sustainable economic development.
- 2.2 The specific objectives of the program are as follows: (i) to reduce the frequency of road closures, and thus shorten journey times on the La Paz-Santa Bárbara segment; (ii) to reduce vehicle operating costs by guaranteeing circulation via the new road; (iii) to reduce the number of traffic accidents; (iv) to reduce corridor conservation costs; (v) to increase transitivity throughout the year and under all weather conditions; and (vi) to repair the socioenvironmental damage caused by construction of the Cotapata-Santa Bárbara highway.
- 2.3 The program seeks to help overcome the bottleneck in access to the departments of Beni and Pando from the country's political center, facilitate trade between these departments and the rest of Bolivia, and promote connections with and opening up of the Brazilian and Peruvian markets. This will generate economic development opportunities including expansion of the agricultural frontier and tourism, and guarantee continuous access to the Nor-Yungas zone from La Paz. The environmental hazards to be repaired include problems of drainage systems, slope stability, damage to land plots, materials disposal sites (*buzones*), and compensation for certain residents in the area affected by the highway. The program also aims to establish mechanisms to ensure continuity and sustainability in the conservation of road assets between Cotapata and Santa Bárbara, which, as a high altitude mountain road, suffers from major geological instability. Indicators to verify achievement of these objectives are set out in the logical framework matrix (MML) in Annex 1.
- 2.4 This program is of major importance and urgency for Bolivia, given the characteristics of the zone, especially in the Cotapata-Santa Bárbara section, which descends from the altiplano to the Amazon plain, traversing a spur of the Andean cordillera. In this zone, the road drops from 3,100 to 970 m above sea level, crossing an unstable fractured rock formation which has been further degraded by exposure to natural elements during the building of the highway. Steep hillsides, unstable terrain, high rainfall, and strong seismic activity intensify the action of natural drainage in making slopes even more unstable. Rainwater runoff and difficulties in keeping drainage systems in good working order can potentially generate problems affecting slopes, bridges, viaducts, and tunnels, even compromising the safety and transitivity of the highway—generating high-risk situations for users and local inhabitants, and possibly leading to the closure of the

road for lengthy periods. Unless the stabilization and drainage works identified to solve the priority problems start relatively soon (along with the hazard management, preventive maintenance and conservation program), the costs of dealing with such problems could increase geometrically in the future, thereby rendering the resources available for this operation insufficient.

- 2.5 Preparation of this program took account of lessons learned in earlier projects, including: (i) ensuring a suitable level of detail in the engineering designs and budgets; (ii) adequately taking account of factors that could produce delays, in order to define a realistic timeframe for execution; (iii) maintaining a close relationship with specialists from the Country Office; (iv) keeping the number of components to a minimum, in order to facilitate execution; even so, five mutually complementary components that are closely linked to the program's objective were deemed necessary; (v) concentrating responsibilities in a single executing agency; and (vi) minimization of the number of conditions precedent to the first disbursement.

B. Program description

- 2.6 To achieve the established objectives, five complementary components have been designed, as described below:

1. Component 1. Rehabilitation of the La Paz-Cotapata segment (US\$5.16 million)

- 2.7 This segment starts at the La Paz city limits in the locality of Calajahuira, and extends as far as Cotapata. It is roughly 44 km long, and its path crosses the Andes, running from the altiplano through the watershed to the source of the Amazon, the highest point being La Cumbre at 4,600 m above sea level. This section of the corridor has been operating for 20 years, and has now reached the end of the useful life for which it was designed. As the opening of the Cotapata-Santa Bárbara section is expected to generate a substantial increase in traffic, it needs to be refurbished and resurfaced.
- 2.8 The refurbishment work includes restoration and complementation of the entire surface and underground drainage network, small-scale slope stabilization works, and the construction of culverts in certain places. The final designs also include prior tasks such as filling surface potholes (and also deeper ones), and subsequent application of a hot concrete asphalt overlay 5 cm thick. In addition, partial reconstruction is anticipated on certain sectors, where the road surface has been damaged. Hard shoulders will also be resurfaced with hot concrete asphalt of variable thickness, in order to avoid steps in the road surface, and ensure adequate drainage.

- 2.9 To facilitate the work, the SNC already has engineering projects at the final design stage, and the corresponding bidding documents are currently being prepared. This component also includes the financing of technical works supervision.

2. Component 2. Stabilization works on the Cotapata-Santa Bárbara segment; hazard management and road conservation on the La Paz-Cotapata-Santa Bárbara section (US\$21.768 million).

- 2.10 The section to be paved is followed by a 50 km stretch of road between Cotapata and Santa Bárbara in rugged, unstable terrain (paragraph 2.4). This part of the highway has taken about 10 years to build, and completion is scheduled for 2005. Special unstable geological characteristics made it necessary to build a 1,400 m long tunnel in the locality of San Rafael, in addition to 10 km of viaducts and semi-viaducts, retaining walls, special anchoring, steel mesh netting, and complex slope protection structures. There have been a number of major landslips on the Nogalani hill, a sector located between kilometers 35 and 36, which have delayed completion of the road; and several stabilization works are currently being carried out, with ADC funding.
- 2.11 A number of “environmental hazards” remain from the construction of this segment—mostly geotechnical stability problems with the potential to block the road, waste material deposits (*buzones*) that have not been recovered, and deficient drainage systems.¹¹
- 2.12 Given the vulnerability of the Cotapata-Santa Bárbara segment, it is essential to have a sustainable strategy in place to minimize corridor hazards and the number of days on which this segment will inevitably be closed until the land stabilizes. In addition to the stabilization and drainage works identified to solve the priority problems, the following are also needed: an early warning system, a hazard management program, ongoing preventive maintenance and conservation, and financial resources in reserve to guarantee conservation of the corridor after the program has ended. The geotechnical specialists estimate that a mountain road of this type takes about 10 years to stabilize.
- 2.13 In order to achieve that sustainability target, it was agreed with the SNC that the best solution involved hiring a single construction firm for a 10-year period, five years financed by the loan, and the remainder funded by the government’s own resources. This “macro” contract will include three activities: (a) execution of priority stabilization works identified for the Cotapata-Santa Bárbara segment; (b) hazard management and implementation of preventive actions and emergency services on the La Paz-Cotapata-Santa Bárbara and Chuspipata-Yolosa-

¹¹ Apart from the difficult hydrological, climatic, geotechnical, and geomorphological conditions prevailing in the zone, the main causes of these hazards, were: (i) inadequate detail in the original engineering design projects, in several specific sectors; (ii) environmental studies that specified unsuitable sites for materials disposal; (iii) drainage systems that were too short or not properly terminated; and (iv) shortcomings in terms of the maintenance and cleaning of drainage works.

Chicaparque segments (the old route), including implementation and operation of an early warning system for the Cotapata-Santa Bárbara section; and (c) preventive maintenance and conservation of the La Paz-Cotapata-Santa Bárbara section on the old route, and access to the El Chairó village. The program also envisages the creation of a Reserve Fund for Conservation, to guarantee the availability of resources to meet conservation expenses arising during that single contract, once Bank funding comes to an end (paragraph 2.22).

a. Subcomponent 1. Engineering, Supervision, and Administration

- 2.14 The civil works in this component will be supervised by a consulting firm or consortium of consulting firms hired by international competitive bidding

b. Subcomponent 2. Stabilization works on the Cotapata-Santa Bárbara segment

- 2.15 The geological complexity of the region, in conjunction with natural phenomena and human activity, will continue to generate new situations of instability until a satisfactory degree of natural equilibrium is attained. As this subcomponent needs flexibility to address future problems effectively, the multiple works modality will be used.
- 2.16 The types of complementary stabilization works envisaged include the extension and refurbishment of drainage systems, repair of environmental hazards (paragraph 2.11), protection of slopes with shotcrete or steel mesh netting, the filling of slope cavities, installation of dynamic metal barriers, concrete or gabion retaining walls, anchored screens, construction of channels, culverts, and concrete energy dissipators, in addition to subdrains, break-flow piers and other items. The selected representative sample includes, at the detailed design level, at least 50% of the civil works identified by experts for this segment. Details of the works envisaged are set out in the environmental manifest.¹²
- 2.17 To be eligible for admission as part of this subcomponent, works not foreseen prior to approval of the operation must: (i) be located within the Cotapata-Santa Bárbara segment; (ii) represent significant risks for the highway, its structures, or third parties; and (iii) fall outside the remit of the preventive maintenance, conservation, and hazard management subcomponent.
- 2.18 Several of the works identified require immediate attention, and their execution is extremely important since they involve compromised structures with the potential to affect a number of local residents. It has been recommended to address critical issues immediately while the program is obtaining final approval from the Bank.

¹² IDBDOCS#373501.

The investments needed by these works can be recognized retroactively, provided the respective contracting procedures follow Bank rules and policies.

c. Subcomponent 3. Hazard management on the La Paz-Santa Bárbara highway

- 2.19 The characteristics of the zone (paragraph 2.4) generate highly vulnerable conditions that could adversely affect local residents and road users. Following the recommendations issued in the report on risk and vulnerability in the km 32-38 section,¹³ and given the nature of other interventions, the program will finance the design, procurement, installation, and operation of a hazard management and early-warning system, using on-site sensors to monitor and collect weather data and seismic information on critical sections of the roadway. This automatic monitoring and early-warning system will make it possible to close the road temporarily for preventive reasons, and also to alert residents in the community of Pacallo located at the foot of the Nogalani hill.
- 2.20 This subcomponent consists initially of a hazard study and design of the system, and subsequently of implementation and operation thereof, as well as coordination of all elements that make it possible to address efficiently the issues of prevention and timely solution of any emergencies that may arise. As it forms part of a single contract, decision-making mechanisms and implementation of contingency plans will be centralized with the same contractor, and this should speed up the whole process. To optimize efforts, the component will include installation of an information databank and database with basic information on the highway and its related projects.

d. Subcomponent 4. Road conservation on the La Paz-Santa Bárbara highway

- 2.21 Maintenance requirements on the Cotapata-Santa Bárbara Highway are completely different from those of a conventional road, because, in addition to keeping road surfaces clean, preventive and corrective actions are needed such as maintenance and cleaning of drainage systems and hard shoulders, installation and cleaning of protective steel netting, protection and/or reconstruction work on at-risk structures, and complementary actions using special equipment and skilled personnel, and all activities relating to maintenance and operation of the San Rafael tunnel. Preventive maintenance and conservation of this segment is very urgent—a top priority—because failure to do this properly will result in a significant increase in the number of places subject to instability, causing hazard levels to rise sharply. This subcomponent also provides for implementation of a specific environmental

¹³ Roy Hunt: "Slope Failure Risk Assessment," December 2002.

management plan that pays particular attention to appropriate management of materials disposal sites and unloading depots (*buzones*).¹⁴

- 2.22 To guarantee the sustainability of this subcomponent and cover conservation expenses in the “macro” contract over a 10-year period, during which the highway is expected to reach an acceptable level of stability (paragraph 2.12), it is proposed that a Reserve Fund for Conservation be set up as a trust fund administered and managed according to Bolivian legislation, with minimum annual contributions of US\$400,000 financed from the National Highway Conservation Account (paragraph 1.9). These resources are equivalent to what would be provided each year by the SNC for maintenance of roads subject to conservation under the program (paragraph 2.13) and maintenance of the San Rafael tunnel. At the end of five years in which the Bank will cover contract expenses, the SNC will use the resources partially and gradually to cover its contractual obligations until program conclusion. Any amount left over at the end of 10 years will be returned to the National Highway Conservation Account.¹⁵
- 2.23 To ensure that the contracting firm fulfills its commitments properly, the contract will also specify criteria for annual evaluation of compliance and performance by the contractor based on indicators of the level of road service provided, and timely response to contingencies. A regime of penalties and causes for rescinding the contract will also be established, on the basis of the annual evaluation or in response to serious nonfulfillment.

3. Component 3. Design for improvement of the Santa Bárbara-Caranavi segment (US\$5 million)

- 2.24 Continuing from Santa Bárbara northwards towards Caranavi, conditions are less problematic than in the preceding segment, but the road is still too narrow and dangerous; and, like the old route through Yolosa, traffic is forced to circulate on the left hand side of the roadway, giving priority to ascending vehicles. In designing the optimum solution for this section, possible alternative routes need to be identified in order to construct a safe and stable roadway, taking advantage of experience gained on the Cotapata-Santa Bárbara highway. In order to define the best route, engineering designs will be done in two stages: (i) subcomponent 1: feasibility study of section of road and a preliminary design comprising an initial contract that includes only studies of alternative routes, socioenvironmental and economic evaluation of alternatives, economic feasibility of the route, and the preliminary engineering; and (ii) subcomponent 2: final road engineering design that will be commissioned once the definitive route has been chosen and the major structures scaled (including bridges, viaducts, tunnels, retaining walls, and other

¹⁴ This subcomponent seeks to correct one of the problems identified in the PMT [see paragraph 1.7 (i)].

¹⁵ The basic guidelines of the contract and the reserve fund mechanism can be consulted in document IDBDOCS#371056.

slope stabilization measures, among other works). The consulting firm that does the preliminary engineering studies may not participate in the tender to produce the final designs, but will be responsible for preparing the terms of reference. Economic feasibility analysis of this segment is expected to take account of impacts on production in the area adjacent to the entire northern corridor, since this section acts as a major physical barrier to effective integration of the departments of Beni and Pando with the rest of the country. Terms of reference for contracting this component are already prepared, and during the analysis mission the SNC was authorized to proceed with the corresponding tender.

4. Component 4. Social compensation and road safety (US\$1.685 million)

a. Subcomponent 1 - Social compensation.

- 2.25 The old access road to the Nor-Yungas region through Chuspipata has limited traffic capacity, and conditions are highly dangerous. The locality of Yolosa, which lies on this road at the entry to the municipio of Coroico, is by-passed by the new Cotapata-Santa Bárbara highway. As the commercial activities of the inhabitants of Yolosa depend on truck traffic using the old road, local residents will be adversely affected when the latter is opened to the public in 2005, since the new road would be 7 km away (See Program Environmental Strategy).
- 2.26 To solve this indirect impact, and given that the problem affects a low-income population group, the SNC and the project team have analyzed a variety of alternatives with the inhabitants of Yolosa, in order to find a solution that enables them to undertake alternative activities to generate new incomes and improve their living standards. As a result of meetings held with the community of San Joaquín, through which the new road passes, land plots have been assigned to enable the inhabitants of Yolosa to relocate. The two communities have established a neighborhood board, comprising a total of 72 families, 41 from Yolosa and 31 from San Joaquín, who will be beneficiaries of the Social Compensation Plan (PCS).
- 2.27 The PCS will consist of the following: (i) design and construction of a service zone (SZ) alongside the highway, but off the right of way, where local people can carry on businesses and provide services; (ii) locational plans for 72 homes, and a housing self-construction unit; (iii) design and construction of a school for roughly 125 children; training for the 72 individuals that will participate in service zone businesses; and (iv) administration of the SZ during its initial period of operation.

b. Subcomponent 2 - Road safety

- 2.28 The old road from Las Yungas Norte between Cotapata and Coroico is very dangerous because of its winding course and narrow road surface that limits overtaking and makes it difficult for vehicles to pass each other. Although opening of the Cotapata-Santa Bárbara segment represents a substantial improvement in

road safety in principle, the expected increase in traffic flows and significant rise in vehicle speeds pose a potential road safety problem for the new highway. This negative impact will need to be mitigated by installing suitable traffic control mechanisms. The road safety subcomponent will cover the whole La Paz-Cotapata-Santa Bárbara corridor, strengthening existing horizontal signaling and implementing vertical signs appropriate to conditions of visibility and the rainfall regime of the zone.¹⁶ Given the permanent foggy conditions in the highest altitude sector of the road, signaling will include additional safety mechanisms such as crash barriers and cats-eyes. The design has adhered to international standards defined specifically for mountain roads in areas of high precipitation and frequent fog. For the Cotapata-Santa Bárbara segment, existing signs will be complemented, to bring them into line with road safety standards. Following an analysis of alternatives with the SNC, it was decided to tender this subcomponent separately from the construction works in program components 1 and 2. The corresponding designs are already finalized, and the project team has certified their quality.

- 2.29 The old route through Chuspipata and Yolosa is expected to be included in the program because it is essential to keep it in adequate operational condition as the alternative access route to Santa Bárbara. Its conservation, therefore, forms part of component 2. In terms of road safety, in addition to maintenance of vertical signs, an alternating traffic flow timetable will be implemented to prevent the road being used in two directions, thereby reducing the risk of accidents.

5. Component 5. Institutional strengthening (US\$1.946 million)

- 2.30 Although the SNC has recently completed an institutional strengthening process (see box), there are a number of areas that need additional attention. For that reason a highway sector support component (SNC) is currently being executed as part of the 1039/SF-BO program. This includes: (i) training; (ii) basic information and highway statistics; (iii) road surfacing management system; (iv) strengthening of the environmental unit; and (v) investments in equipment for weight control and systemization.

¹⁶ The La Paz-Santa Bárbara Highway passes through high altitude mountain areas with copious rainfall (snow in the highest part) and frequent fog, which makes driving very hazardous.

- 2.31 Although SNC restructuring has made it possible to raise the professional level of the institution, staffing levels have been frozen and cannot be increased. This constraint means that staff have to divide their time between various projects simultaneously, and as there is no possibility of assigning a group exclusively to program oversight and management (paragraph 3.4), this aspect needs to be strengthened. The institutional strengthening component has been designed to build up management capacity and to finance staff training in a number of key areas, including: (i) support for the project coordinating unit (PCU); (ii) training for the staff of SNC and Prefecture of La Paz (PLP) on topics relating to hazard management, geotechnics, highway maintenance in geologically complex and unstable zones, socioenvironmental management, and road safety audits; (iii) procurement of vehicles, office and communications equipment and supplies, and software to enable the SNC to oversee and monitor the program; (iv) preparation of a contingencies plan and master plan for hazardous cargos; and (v) review of baseline indicators for program management and oversight, and data acquisition methodologies.

SNC INSTITUTIONAL REFORM PROGRAM

The institutional reform program led by the World Bank has achieved a significant increase in the technical level of the SNC. As part of this program, in September 2001, a permanent Board of Directors was appointed for the institution, which initiated preparatory activities for signing an Institutional Reform Agreement (ARI). This made it possible to design a modern organizational structure, giving financial sustainability to the civil service program, and initiating the public invitation to apply for responsibility posts, a task that has now been completed. Within the ARI, the SNC carried out its institutional reform, implemented a new organizational model, established the administrative career envisaged in the Civil Servant Statute, and achieved performance indicators and targets as identified. For its part, the Technical Unit of the Office of President (UT) partly financed the costs of the new staff and wage structure, and others costs stemming from institutional adaptation. To verify fulfillment of commitments, an Institutional Reform Support and Monitoring Committee was established in the SNC (CAS/SNC), consisting of the SNC itself, together with the MH, MDE, UT, the World Bank and the Donors Consultative Committee. In order to achieve objective measurement, the ARI defined detailed performance indicators and targets, grouped into five categories: (i) administrative organization and administrative career; (ii) technical regulations and management systems; (iii) restoration, conservation, and improvement of the RVF; (iv) definition of highway development policies and plans; and (v) obtaining financial resources.

C. Cost and financing

- 2.32 The program will cost US\$41.435 million, of which 80% (US\$33.148 million) is expected to be financed by the Bank, and the remainder funded by the local counterpart. The latter will be divided between the Prefecture of La Paz (US\$7.308 million) and the SNC (US\$979,000). Table 2-1 sets out the details:

Table 2-1					
PROGRAM COSTS					
	COMPONENTS	IDB	LOCAL COUNTERPART		Total
			PLP	SNC	
1	Rehabilitation of the La Paz-Cotapata segment				5,160,000
1.1	Engineering, supervision, and administration	336,000	64,000		
1.2	Civil works	3,998,400	761,600		
2	Stabilization works on the CP-SB segment, hazard management and road conservation LP-CP-SB				21,768,000
2.1	Engineering, supervision, and administration	1,848,000	352,000		
2.2	Stabilization works, Cotapata-Santa Bárbara segment	11,181,100	1,886,900		
2.3	Hazard management on the la Paz-Santa Bárbara highway	634,200	120,800		
2.4	Road conservation on the La Paz-Santa Bárbara highway	3,683,800	2,061,200		
3	Designs for improvement of the Santa Bárbara-Caranavi segment				5,000,000
3.1	Feasibility study of the corridor, EIA, and preliminary design	1,260,000	240,000		
3.2	Final highway engineering designs	2,940,000	560,000		
4	Social compensation and road safety				1,685,000
4.1	Social compensation (Yolosa)	982,800	187,200		
4.2	Road safety	432,600	82,400		
5	Institutional strengthening				1,946,000
5.1	Support for the program coordination unit	570,000		825,000	
5.2	SNC staff training	120,000			
5.3	Procurement of vehicles, office equipment, and software	301,000		49,000	
5.4	Hazardous Cargos Master Plan	34,400	6,600		
5.5	Generation of baseline indicators	33,600	6,400		
6	Program audit				335,000
6.1	Financial audit	151,200	28,800	105,000	
6.2	Environmental audit	42,000	8,000		
7	Contingencies	3,015,100	574,300		3,589,400
8	Financial expenses				1,952,000
8.1	Inspection and supervision	331,000			
8.2	Commitment fee		368,000		
8.3	Interest	1,253,000			
PROGRAM TOTAL		33,148,000	7,308,000	979,000	41,435,000

III. PROGRAM EXECUTION

A. Borrower, guarantor and executing agency

- 3.1 The borrower in this operation is the Republic of Bolivia. The executing agency will be the National Roads Service (SNC), an autonomous body attached to the Ministry of Services and Public Works.
- 3.2 The SNC has a Board of Directors consisting of a chairman and four directors; the chairman also serves as chief executive officer. It also has units of an Internal Audit, a General Secretariat, and a Quality Management Unit for purposes of control, coordination, and support. Management is supported by six divisions as follows: planning and technology development, socioenvironmental, road conservation, construction, administration and finance, and legal. The SNC is a horizontal organization with no other hierarchical levels below the divisions and heads of regional offices.
- 3.3 Under Bolivian law, counterpart funding for highway works is provided by the prefectures of the departments in which the works are carried out. For the purposes of the program, this obligation corresponds to the prefectures in the Department of La Paz.

B. Project execution and management

- 3.4 Project execution will be the exclusive responsibility of the SNC. The planning division will be responsible for works programming, preparation of bidding documents, and the process of awarding contracting for and monitoring studies. The construction division will supervise works execution, inspection of works contracts and technical supervision, together with the corresponding bidding processes, and will also be responsible for the contracts for execution of components 1 and 2. The conservation division will support the construction division in executing the “macro” contract on issues relating to preventive maintenance and conservation (paragraph 2.13). The socioenvironmental division will monitor works development, performing inspections and verifying compliance with all environmental specifications and management plans designed for the civil works. It will also be responsible for implementing the compensation program for inhabitants of Yolosa and San Joaquín (see Execution Scheme, IDBDOCS#388989).
- 3.5 The SNC will appoint four inspectors to oversee the program, drawn from existing staff or personnel contracted by it. One inspector will deal with the construction area (contracted works), another with the studies area, a third with highway maintenance, and the fourth with socioenvironmental inspections. Bearing in mind the experience gained in the management of other projects, it was decided to set up

- a project coordinating unit (PCU) to support various aspects of program execution and preparation of information for interface with the Bank. The PCU is likely to consist of a project coordinator and five consultants to provide support in the areas of financial management, works engineering, maintenance management, supervision of studies and designs, socioenvironmental considerations, and administrative support (secretary, assistant, and chauffeur). This will be covered with the proceeds of the loan. The PCU staff will report to the Constructions Manager through the main coordinator. The cost of additional support staff for the PCU, and the unit's operating expenses, will be charged to the SNC counterpart contribution.
- 3.6 The program will use several mechanisms to monitor and ensure the quality of works execution. Firstly, three inspectors will work directly in the field to monitor the works on site, and another will accompany the consultants hired to design component 3 (paragraph 2.24). The inspectors will receive support from consultants who will join the PCU for specific issues as required by program components. The engineering and supervision costs include an amount for hiring two specialist supervision firms to ensure that contractors fulfill their commitments—evaluating their performance parameters, the quality of the works, measurement of work quantities for payment purposes, and a technical review of designs that need to be modified or complemented. The SNC will hire these firms directly, following Bank procurement procedures.
- 3.7 The executing agency will need to obtain the Bank's nonobjection for projects in the component on complementary drainage, geotechnical and environmental works for the Cotapata-Santa Bárbara segment, before starting bidding processes for specific items. For this purpose, the works should comply with the eligibility criteria defined for this component (paragraph 2.17).
- 3.8 As executing agency, the SNC will: (i) maintain separate and specific bank accounts for the management of IDB and local counterpart resources; (ii) submit disbursement requests and justifications for eligible expenses on a timely basis; (iii) maintain adequate information systems for the program's accounting and financial management, integrated with official SNC accounting; in addition to a contract administration and project control system, and the corresponding internal oversight structure for management of IDB and local counterpart funding and that of other financiers in accordance with Bank requirements; (iv) prepare and present project financial reports, half-yearly revolving fund statements, and other financial reports as requested by the Bank, including audited financial statements for the program and the SNC; and (v) maintain an adequate system for filing documentation in support of eligible expenses, for verification by the Bank and the external auditors.

- 3.9 A revolving fund will be set up equivalent to 5% of the loan amount to facilitate execution. The SNC will file half-yearly statements of this fund within 60 days following the end of each half-year.
- 3.10 The PCU socioenvironmental consultant will support the socioenvironmental inspector in his/her functions, which include: (i) performing environmental supervision of program works; (ii) reviewing, monitoring, and supervising the environmental management plans of contractors, encampments, materials deposit sites, quarries, asphalt plants, concrete mixing plants, and other works activities in compliance with the prevention and mitigation programs (PPM) and the environmental application and monitoring plans (PASA); (iii) preparing environmental reports for the SNC socioenvironmental division and the Bank; (iv) providing assistance for communications and reports to the Vice-Ministry of Natural Resources and the Environment (VMRNMA);¹⁷ and other environmental authorities as necessary; (v) monitoring and assisting the SNC in implementing the Social Compensation Program (PCS) and in contacts with the communities, especially those of Yolosa and San Joaquín; (vi) evaluating contractors' contingency plans in works as required; and (vii) preparing reports and monitoring the correction of environmental hazards envisaged in the environmental manifest, along with others identified during program development.
- 3.11 The social compensation component (paragraphs 2.25-2.26) will be executed and monitored directly by the SNC socioenvironmental division. The latter is also responsible for execution of the corresponding works tenders, and management of relations with the affected communities. It will be supported by the environmental consultant hired to assist the PCU.

C. Execution and disbursement timetable

- 3.12 Program execution is expected to last six years from the date on which disbursement conditions are fulfilled. Table 3-1 sets out the expected disbursement schedule. The deadline for physical start of the works will be 48 months.

¹⁷ The VMRNMA, attached to the Ministry of Sustainable Development (MDS), is responsible for inspecting program works and issuing the corresponding environmental permits.

Table 3-1 DISBURSEMENT SCHEDULE
NORTHERN CORRIDOR HIGHWAY PROGRAM LA PAZ-CARANAVI SEGMENT

COMPONENT	YEAR							TOTAL
	2005	2006	2007	2008	2009	2010	2011	
Rehabilitation of LP-CP segment	80,000	5,080,000						5,160,000
Stabilization works on CP-SB segment, hazard management and road conservation on LP-CP-SB segment		1,267,000	6,522,000	5,700,000	4,214,000	2,738,000	1,327,000	21,768,000
Designs for improvement of the SB-CA segment	375,000	1,125,000	2,625,000	875,000	-	-	-	5,000,000
Social compensation and road safety	139,000	567,000	787,000	65,000	57,000	35,000	35,000	1,685,000
Institutional strengthening	100,000	451,000	210,000	285,000	285,000	375,000	240,000	1,946,000
Program audit	25,000	45,000	45,000	45,000	45,000	65,000	65,000	335,000
Contingencies (10%)	-	179,470	718,000	1,077,000	897,000	359,000	359,000	3,589,000
Financial expenses	50,000	234,000	276,000	315,000	342,000	361,000	374,000	1,952,000
TOTAL OPERATION								41,435,000

Note: LP-La Paz, CP-Cotapata, SB-Santa Bárbara, CA -Caranavi

D. Procurement of goods and services

- 3.13 The executing agency will conduct tenders for civil works, works supervision, and engineering designs. The works will be executed by private construction firms; studies and technical assistance services will be provided by independent specialist consulting firms. Procurement of goods, civil works contracting, and the hiring of consulting services will be conducted in accordance with the Bank's procurement policies and procedures. If authorized by the Bank, the training courses envisaged for SNC staff could be provided by higher education institutes, under a specific agreement to be signed between the SNC and the respective institution, adhering to the model approved by the Bank.
- 3.14 International competitive bidding will be required when the financing used is in foreign currency and the estimated contract values exceed the equivalent of US\$3 million in the case of civil works, US\$350,000 for procurement of goods and related services, and US\$200,000 in the case of consulting services.

E. Monitoring and evaluation

- 3.15 The program will be monitored through six-monthly execution reports to be submitted to the Bank within 60 days following the end of each calendar half-year,

reporting project results evaluated using the monitoring indicators specified in the logical framework matrix. These reports will also contain the following information: (i) progress achieved in relation to the execution indicators and disbursement timetable agreed upon for this project; (ii) updated disbursement and execution timetables in relation to the rest of the program; (iii) work plan and detailed plan of action anticipated for the following two half-years, including the up-to-date procurement plan (Annex II); (iv) report on the progress and development of environmental programs; and (v) evaluation of the technical performance indicators defined in the logical framework matrix, to make it possible to update the Project Performance Monitoring Report (PPMR).

- 3.16 Project outcomes will be evaluated using a series of objective technical indicators as specified in the program's logical framework. The values of these indicators will be measured before and after program execution.

F. Ex post evaluation

- 3.17 Following discussions between the project team and the Bolivian authorities, the SNC agreed to perform an ex post evaluation of the program, funded from its own budget, three years after the final disbursement has been made.

G. Audits

- 3.18 During program execution, the executing agency (SNC) will submit annual financial statements for itself and the program. The external program audit will be conducted by a firm of independent auditors acceptable to the Bank, in accordance with Bank requirements (documents AF-100 and AF-300), and under terms of reference previously agreed to by the Bank (document AF-400). Annual audited financial statements for the program and the SNC will be submitted within 120 days following the end of the fiscal year, and those relating to conclusion of the program within 120 days following the final disbursement.
- 3.19 Selection and contracting of the audit firm will adhere to procedures established in the document on bidding for external audits (document AF-200). The costs of the audit will be included in program expenses and financed from the proceeds of the Bank loan.
- 3.20 Two environmental audits will be performed by recognized independent auditors, the first in year 4 of execution and the second six months before the final disbursement. The financing of these audits also forms part of the loan operation.

H. Loan conditionalities

- 3.21 **Conditions precedent to the first disbursement:** the borrower will present evidence to the Bank's satisfaction of: (i) the signing and entry into force of the agreement between the SNC and municipio of Coroico, under terms agreed to with

the Bank, for conservation of the access road to the El Chairó village; and (ii) the signing and entry into force of the management agreement between the SNC and the Ministry of Finance, including the timetable and resource commitment date. A set of Operating Regulations will not be required under this agreement because the SNC has been integrated into the Bolivian government's Institutional Reform Program (PRI) (paragraph 2.30).

1. Special conditions for program execution.

- 3.22 Establishment of the PCU and appointment of its coordinator and at least two of its members will be a condition precedent to the contract for rehabilitation of the La Paz-Cotapata segment.
- 3.23 As a condition precedent to award of the contract for stabilization works on the Cotapata-Santa Bárbara section, and for hazard management and highway conservation of the La Paz-Santa Bárbara segment, the Reserve Fund for Conservation of program works must have been established, on the terms agreed with the Bank. As a condition precedent to disbursement of the advance for startup of the contract, the first payment must have been made to the Fund.
- 3.24 Implementation of the solution proposed by the Social Compensation Plan (Yolosa) will be a condition precedent to the contract award for final designs for the Santa Bárbara-Caranavi segment.
- 3.25 The SNC will make annual contributions equivalent to US\$400,000 per year to the Reserve Fund for Conservation, drawn from the National Highway Conservation Account. For this purpose, the SNC will make annual contributions equivalent to US\$400,000 per year to the Reserve Fund for Conservation, drawn from the National Highway Conservation Account. By 31 August each year, the SNC will send the Bank a voucher verifying the corresponding payment to the account of the Reserve Fund for Conservation, issued by the Central Bank of Bolivia.

IV. VIABILITY AND RISKS

A. Institutional viability

- 4.1 The National Roads Service (SNC) has broad experience of the management of complex projects, and is currently executing several simultaneously in different regions of Bolivia. Highway projects under execution with Bank financing include loan 1039/SF-BO¹⁸ Ventilla-Tarapaya, which includes construction and surfacing work on that segment, strengthening of the road surface between Tarapaya and Potosí, and periodic maintenance between Potosí and Sucre; and loan 1101/SF-BO,¹⁹ which includes construction and surfacing work on the Paraíso-El Tinto section, hardcore rehabilitation of the Roboré-El Carmen section, and routine maintenance of the El Carmen-Puerto Suárez segment. Other works are also being executed, with funding from the ADC, BNDES and bilateral assistance organizations.
- 4.2 The new SNC organizational structure that resulted from the institutional reform program (paragraph 2.30) succeeded in raising the professional level of the institution's staff, but reduced their number from over 700 to around 300. As this downsizing has increased the workload of the institution's staff, the PCU has been designed to ensure program monitoring is carried out effectively, and also as a strengthening mechanism, (paragraph 3.4)—a scheme that has given good results in the execution of recent projects (paragraph 4.1). It is also intended to outsource the hazard management, preventive maintenance, and conservation component.
- 4.3 The SNC will be responsible for administration of program contracts and inspection of the services provided by consulting firms. The project team concluded that the SNC has the necessary capacity and experience; and the support to be provided by individual consultants hired for the PCU will be sufficient to fulfill this function. A substantial proportion of procurements will require international competitive bidding.²⁰

B. Socioeconomic viability

- 4.4 In order to evaluate the program's economic feasibility,²¹ the La Paz-Santa Bárbara segment was considered as a single entity. Nonetheless, the different nature of the interventions projected in each of the segments (La Paz-Cotapata and Cotapata-

¹⁸ 1039/SF-BO: BO-0098-Ventilla-Tarapaya Highway - Road Sector Support.

¹⁹ 1101/SF-BO: BO-0036- Santa Cruz-Puerto Suárez Integration Corridor.

²⁰ Procurement Plan.

²¹ Economic Evaluation Report and Tables: Flow of Funds and Evaluation Indicators.

Santa Bárbara) means that the source of the benefits will be different in each case (paragraphs 4.6 and 4.7).

- 4.5 Traffic estimates and projections for both segments were calculated in integrated fashion, under the following assumptions: (i) surfacing work currently underway on the Cotapata-Santa Bárbara segment is completed and put into service, so traffic generation attributable to the highway, including that on the La Paz-Cotapata segment, is counted as existing traffic; and (ii) the only difference in traffic volumes on the two segments is the percentage traveling to and from Sud-Yungas that does not pass through Cotapata-Santa Bárbara.
- 4.6 For the La Paz-Cotapata segment, the benefits were calculated on the basis of cost differences in vehicle operation and maintenance comparing the “without project” situation (i.e. no rehabilitation) and the “with project” situation (in which refurbishment is carried out). This evaluation was made using the HDM 3.0. model.
- 4.7 On the Cotapata-Santa Bárbara section, the benefits take account of the costs arising from temporary road closures caused by geotechnical problems, which require traffic to be diverted via the old road. For this analysis, with—and without—project hypotheses were established according to estimates made by the expert geotechnical consultants who participated in designing the corresponding components; these experts estimate that a mountain road of this type requires about 10 years to stabilize. The analysis forecasts the number of potential closures and the reconstruction of viaducts and other structures, along with additional requirements relating to geotechnical protection elements and drainage systems, both with the program and without it. The results obtained estimate the social profitability of the program in terms of an internal rate of return of 22.9%, and a net present value of US\$9.4 million (using a 12% discount rate). The economic evaluation report presents the detail of costs, benefits, and results of sensitivity analysis, which were also satisfactory; concluding that in the most critical scenario, when the benefits are cut by 20%, the internal rate of return would still be in excess of 17%.
- 4.8 The sunk costs of the road segment between Cotapata and Santa Bárbara are quite high, and maintenance of operating conditions on this stretch of road will absorb substantial resources until the geological conditions of the zone are stabilized. This is normal on high mountain roads with a humid tropical climate. Nonetheless the project is a vital investment for the future of the country, with estimated real benefits that are far greater than expected, once a satisfactory land communication network is established with the northern region of Bolivia, whose main bottleneck is the zone addressed by the program.

C. Financial viability

- 4.9 As part of the preparatory studies for this operation, a financial analysis was made of government agencies involved in the program. For the external loan operations

that the central government is contracting to execute road works on the main highway network through the National Roads Service (SNC), Supreme Decree 25.134 of 1998 established that "... the liability arising in relation to loans for studies, construction works, improvement or maintenance of highways on the fundamental network ... will be paid for by the General Treasury of the Nation," and that "the local contribution committed will be paid by the prefecture of the corresponding department, charged against effective revenue collected from the Special Hydrocarbons Tax (IEHD)..." Should this be insufficient, it will be supplemented by revenues earned from departmental royalties and other alternative sources. The Decree adds that, if prefectures fail to make good on their counterpart obligations, the amounts needed to fulfill the *pari passu* will be directly debited from their revenues and transferred to the National Roads Service.

1. Prefecture of La Paz

- 4.10 In this program, counterpart resources for the highway will be guaranteed by the Prefecture of La Paz (PLP), which depends operationally on funds provided by General Treasury of the Nation (TGN). Analysis shows that the TGN has in the past made the budgetary transfers needed to enable the PLP, using its own resources, to defray current expenses, domestically financed capital investments, and debt service. Furthermore, information obtained from the Vice-Ministry of Public Investment and External Financing (VIPFE) indicates that the PLP has always honored its counterpart commitments in externally funded projects. Under current legislation, if prefectures default on their counterpart obligations, the amounts necessary for fulfillment of the *pari passu* will be directly debited from their revenues for transfer to the National Roads Service.
- 4.11 On the assumption that this situation persists, a projection has been prepared of amounts that are reasonably predictable, excluding projected transfers from the TGN. Table 5-1 shows, as a final outcome, the minimum contributions needed from the TGN, added to the Prefecture's own resources, to enable it to cover its current expenditures, ongoing capital investments, and current debt service. The projections show these funding requirements under two scenarios: (i) before the Bank program; and (ii) with the Bank program incorporated into the Prefecture's finances.
- 4.12 Capital expenditures show the Prefecture's current obligations in respect of ongoing civil works financed with grants and loans included among capital resources, together with an estimate of internally generated funds. The latter is calculated as the difference between external funds receivable plus grants, compared to capital expenditures committed. Works that are foreseeable but for which there is no firm commitment have not been included. The Prefecture will have smaller funding requirements during execution of the project under study, since ongoing civil works will be coming to an end. For example, its local counterpart funding obligations for the Cotapata-Santa Bárbara project alone, which end in 2005, will free up resources

of approximately US\$2.5 million per year—more than the sum needed for the project under study in those years.

Table 4-1
PREFECTURE OF THE DEPARTMENT OF LA PAZ
Preliminary financial projections 2004-2013, with-program situation
(Thousands of US dollars equivalent)

	Current income	Current expenditure	Capital resources	Capital expenditure	Debt amortization	PLP funding req. without program	Local counter part	PLP funding req. with program
	1	2	3	4	5	6 6=Σ (1:5)	7	8 8=6+7
2005	3,550	(6,100)	12,691	(21,592)	(2,572)	(14,023)	(103)	(14,126)
2006	3,550	(6,100)	11,870	(16,028)	(2,350)	(9,058)	(1,326)	(10,384)
2007	3,550	(6,100)	9,780	(11,596)	(3,382)	(7,748)	(1,709)	(9,457)
2008	3,550	(6,100)	1,599	(3,292)	(4,051)	(8,294)	(1,456)	(9,750)
2009	3,550	(6,100)	273	(1,603)	(3,960)	(7,840)	(1,246)	(9,086)
2010	3,550	(6,100)	0	(623)	(3,605)	(6,778)	(928)	(7,706)
2011	3,550	(6,100)	0	(427)	(3,017)	(5,994)	(178)	(6,172)
2012	3,550	(6,100)	0	0	(2,434)	(4,984)	0	(4,984)
2013	3,550	(6,100)	0	0	(2,382)	(4,932)	0	(4,932)
TOTAL (2004- 2013)	31,950	(54,900)	36,213	(55,161)	(27,753)	(69,651)	(6,946)	(76,597)

¹ Note: Current income does not include regular TGN transfers.

- 4.13 The first program scenario, shown in column 6 of table 4-1, reveals that the largest funding requirements occur in 2005 (US\$14.023 million) before the start of the Bank program; requirements fall sharply thereafter, with current capital expenditure commitments decreasing as ongoing investments reach conclusion.
- 4.14 The minimum financial requirement indicated for the current year is similar to contributions made by the TGN in 2003 (the year of lowest income in the historical series). Starting in 2005, the contributions that would be needed fall below the historical appropriation, for the reasons explained in the previous paragraph; so the Prefecture ought to have sufficient resources to finance its activities, provided the TGN maintains its recent level of contributions.

- 4.15 In the second scenario, shown in column 8 of table 4-1, with the Bank program incorporated as of 2005, the need for TGN funding, which exceeds the amount indicated for the first scenario because of emerging program counterpart funding obligations, is also expected to be less than what has been received by the Prefecture in recent years. Thus if the TGN maintains its transfers to the Prefecture at similar levels to those made in the recent past, the latter should again be able to meet its commitments, including the financial contributions required by the program.

2. National Roads Service

- 4.16 Although the PLP is responsible for contributing counterpart funding, program execution requires contributions in addition to those covering the routine functioning of the National Roads Service. In this operation, these involve the cost of inspectors, support staff, and PCU operating expenses.
- 4.17 The SNC execution budget is heavily reliant on external funding for investment in the national roads sector (Financial Report), which accounts for 73% of the total for 2003. The majority of the domestic funds available to the SNC come from three large categories: (i) transfers received from the General Treasury of the Nation (TGN); (ii) resources contributed by the various prefectures as counterparts for loans contracted by Bolivia for use in the highway sector; and (iii) funds generated from tolls levied on national roads.
- 4.18 SNC “operating expenses” display steady growth from 2001 onwards, reflecting progressive implementation of the institutional reform plan (PRI), partly financed by the World Bank, which promoted staff downsizing, higher wages and salaries, and better organization. This program, referred to as “institutionalization”, has led to higher operating costs as a result of severance payments and the new level of wages paid to the newly hired staff (paragraph 4.2). Table 4-2 shows budgetary projections for the next 10 years.

Table 4-2
NATIONAL ROADS SERVICE
Budgetary projections 2004-2013
(Thousands of US dollars equivalent)

	Domestic resources	External resources	Total income	Investments	Maintenance	Operating expenses	Total expenditure
2004	69,667	141,990	211,657	(174,182)	(24,117)	(13,358)	(211,657)
2005	77,020	166,473	243,493	(204,843)	(25,082)	(13,568)	(243,493)
2006	78,343	167,696	246,039	(204,595)	(24,828)	(16,615)	(246,038)
2007	72,346	137,509	209,855	(167,836)	(25,302)	(16,718)	(209,856)
2008	61,983	76,080	138,063	(95,100)	(25,161)	(17,802)	(138,063)
2009	58,018	59,806	117,824	(74,757)	(25,321)	(17,746)	(117,824)
2010	54,996	47,720	102,716	(59,650)	(25,321)	(17,745)	(102,716)
2011	53,384	33,040	86,424	(41,300)	(25,478)	(19,646)	(86,424)
Total 2004/13	525,757	830,314	1,356,071	(1,022,263)	(200,610)	(133,198)	(1,356,071)

- 4.19 Bearing in mind historical operational and financial trends, the increasing activity projected by the SNC, regardless of execution of this project, will depend largely on its continuing ability to successfully appeal to external financial institutions, and its acknowledged capacity to manage such additional activity efficiently. Within this perspective, the SNC is preparing a long-term highway plan whose targets include paving the entire fundamental road network over a 20-year period. This will entail an average investment per year of approximately US\$240 million for 15 years, starting in 2009.

D. Technical viability

- 4.20 Evaluation of the program's technical viability took account of lessons learned from other highway projects executed by the SNC in Bolivia (paragraph 1.13).
- 4.21 All of the program's civil works will be put out to tender with final designs completed, except for geotechnical works in highly unstable locations, where, given the nature of the work, the tender will be at the stage of advanced-detail conceptual design, with the final design forming part of the contract. The Bank has made a detailed review of the final designs for civil works in the La Paz-Cotapata segment, detailed and/or final designs for works on the representative sample of the Cotapata-Santa Bárbara segment, and terms of reference for studies to be contracted as part of the program. It has also made a detailed assessment of designs for the road safety, preventive maintenance, conservation, and hazard management components, verifying their quality. The designs evaluated represent suitable technical solutions and construction cost estimates that are in line with current market prices.

- 4.22 Draft specific terms of reference have already been prepared for each of the actions envisaged in the institutional strengthening component.
- 4.23 A “macro” contract covering construction, conservation, and hazard management for a 10-year period is proposed for the second component, since this alternative is likely to make the program more operational. A contract of this type will be long enough to allow the land to attain an acceptable level of stability; and permit rapid reaction to high-risk situations, since the relevant information will be concentrated in the hands of a single contractor with capacity to act swiftly to deal with problems that arise, including immediate closure of the road; economies of scale will also be obtained.

E. Social and environmental viability

- 4.24 Three types of civil works are envisaged in this program. On the La Paz-Cotapata segment, the tasks involve refurbishment and resurfacing of the road, with expected impacts typical of small-scale construction works that are well-known and easy to mitigate. To ensure adequate execution, the SNC has designed a works management plan, also covering materials sources, waste material disposal sites (*buzones*), and control of pollution caused by asphalt mixing plants, worker encampments, and other related issues.
- 4.25 The second section of road, between Cotapata and Santa Bárbara, concerns the restoration and mitigation of socioenvironmental hazards, as specified in the Environmental Manifest, which was submitted by the SNC to the Ministry of Sustainable Development and Planning on 11 June 2004, and approved on 16 September 2004, in accordance with an Environmental Suitability Declaration (DAA). The DAA is equivalent to the environmental permit for the works of the segment, which basically consist of slope stabilization, construction of geotechnical protection works, lengthening and construction of new drainage systems to protect and repair areas that have been damaged in the rainy season, and stabilization of materials deposits used during the construction process. It is also intended to solve problems of erosion and undermining of the banks of the Huarinilla, Elena, Yolosa and Coróico rivers, caused by uncontrolled discharge of excavated materials into the beds of these rivers, through unrestricted deposits (*buzones*), as well as access to the El Chairo village. While helping to preserve the road in itself, the works will also protect the properties of local inhabitants, the National Park, and the Cotapata Integrated Management Area (PN-ANMI).
- 4.26 The VMRNMA has issued a general prior permit to the SNC for RVF rehabilitation works. To obtain the definitive environmental permit for the La Paz-Cotapata segment, all that remains is to submit the management plan which has already been prepared. The documentation needed for the permit on the Cotapata-Santa Bárbara segment, has already been completed with presentation to the VMRNMA of the Environmental Manifest, which also served as reference for this operation. This

document is currently being analyzed. For the permit on the Santa Bárbara-Caranavi segment, the component includes preparation of the corresponding EIA.

- 4.27 The program's social hazards are concentrated in the Cotapata-Santa Bárbara segment, and concern damage caused to a number of properties as a result of deficiencies in drainage systems, obstruction of river flows, and unstable slopes (paragraph 4.25). The program will also support the population of Yolosa by implementing the PCS (paragraphs 2.25 through 2.27).
- 4.28 The other components involve engineering studies, contracting of firms to support SNC management, and the procurement of equipment and other items, which are not expected to have socioenvironmental impacts calling for specific measures.

F. Environmental and social impacts, and proposed measures

- 4.29 The highway rehabilitation and resurfacing work generates a series of temporary negative impacts, generally affecting an area confined to the fringes of the roadways themselves, along with zones used for materials extraction, disposal of waste materials, construction of encampments, and so forth. These impacts are widely recognized and include the following: (i) disturbance and generation of hazards for local residents and users; (ii) discomfort and risk of accidents; (iii) damage to housing, commercial activities, and neighboring buildings; (iv) risk of environmental degradation in the loan areas, materials deposits, encampments, water bodies, and material transport routes; (v) disruption of infrastructure and existing services; (vi) direct or indirect pollution of air, water, soil, and other environmental factors.
- 4.30 Construction work on the Cotapata-Santa Bárbara segment mostly seeks to repair environmental damage that has persisted since the construction of the road. Implementation of these works generates negative impacts similar to those caused by rehabilitation work, except that their results also produce greater additional benefits by bringing existing instability phenomena under control.
- 4.31 Improved transitivity on the highway will bring major tangible and intangible benefits. The increased competitiveness thus generated will have significant positive impacts distributed throughout the Bolivian population, while directly benefiting users and neighboring populations. The maintenance guaranteed by the program will ensure that the benefits of the road persist through time, and will include neighboring communities both of the new road and the old one.
- 4.32 The environmental management plans developed by the SNC form part of the bidding documents, and provide detailed coverage of environmental protection procedures for all types of impacts associated with the road works envisaged. These should be implemented during the works and after they have been completed.

- 4.33 The negative impact on the people of Yolosa (the new route will reduce their income sources) will be mitigated by implementing the PCS²² (paragraphs 2.27 and 4.27), which will also benefit the community of San Joaquín, by seeking to improve living standards and enhance the capacity of the two populations to engage in business activities. This component is also likely to be used as a model for solving similar problems in other projects. The following measures will help make this plan sustainable: (i) the process of designing the PCS was highly participatory and consensus-based, with various alternatives being considered; (ii) a study of market potential for the SZ; (iii) business training based on a socioeconomic survey of the 72 beneficiary families, identifying aptitudes and needs; (iv) assistance in operation and management of the SZ, diminishing gradually until self-management by the community is achieved; and (v) an implementation timetable that is consistent with program works execution.
- 4.34 To guarantee appropriate social, environmental, and technical monitoring, the program will strengthen the SNC socioenvironmental division for supervision and environmental monitoring of civil works and social compensation, by contracting a socioenvironmental consultant to work alongside the PCU inspector and the general coordinator.

G. Benefits and beneficiaries

- 4.35 The main benefits expected from the proposed program are as follows: (i) preservation of highway assets, with consequent future savings arising from lower maintenance costs; (ii) reduction of transport costs and journey times associated with fewer days of road closure; (iii) better connectivity and integration with the departments of Beni and Pando, which account for roughly 40% of the national territory; (iv) safer road transport, with smaller risk of accidents; (v) greater capacity to engage in business activities among residents of the zone benefited by compensation and training programs; (vi) efficiency improvements in highway management and conservation; and (vii) better circulation throughout the year and during all kinds of weather. The designs of the Santa Bárbara-Caranavi segment will also make it possible to prepare an operation to eliminate the main physical bottleneck, thereby opening up development possibilities for the northern region of Bolivia.
- 4.36 The main beneficiaries will be the users of road segments connecting to the highway, and particularly those of the intervened sections, as a result of lower vehicle operation costs, shorter journey times, and fewer accidents stemming from road safety improvements. These benefits could also extend to the owners and consumers of freight circulating on these sections of the road, and to the inhabitants of the region of Las Yungas, for whom greater tourism development potential will be opened up. Improvements in highway management and conservation will lead to

²² Social Compensation Plan Report.

more efficient use of road conservation resources, and significant future savings on road maintenance, as well as less likelihood of the road being closed.

H. Risks

- 4.37 The main risk of the operation concerns Bolivia's sociopolitical and economic stability. Institutional risk is considered moderate, since the SNC is completing its World-Bank-funded institutionalization program, which gives it stability and continuity (paragraph 2.30). Although an adequate technical level has been achieved in the institution, SNC staffing is insufficient to meet all its commitments; in operations with the Bank, this forces it to obtain support by hiring consultants to complement SNC tasks. There is also a risk of budgetary shortfalls affecting all government institutions, including the SNC and the Prefecture of La Paz, which could hinder or delay program execution. Although the investment required by the SNC to cope with the additional activities generated by the program is not large, there is a chance that funding will be insufficient to fulfill its obligations. There are also uncertainties concerning the allocation of resources for the Highway Conservation Account from the IEHD, given that the Hydrocarbons Law is currently being amended.
- 4.38 The following provisions have been made to mitigate these risks: (i) the program finances practically all costs, and the counterpart will be only needed to cover taxes payable to the National Treasury; (ii) no land purchase is envisaged, which eliminates the need for funds to pay for expropriation; and (iii) the cost of consultants to support the SNC in execution of the different components will be covered.
- 4.39 As regards execution risks, delays and conflicts have arisen in other Bank projects when components have been included that are not closely related to each other, or which have different executing bodies, including entities not under the jurisdiction of the executing agency. Although this program also contains several components, the risk in this case is reduced because they are targeted so as to maintain close relations and mutual complementarity. Moreover, program execution does not involve entities other than the SNC.
- 4.40 Another major risk stems from uncertainty over the magnitude of geotechnical stability problems that could arise during program execution, as a result of climatic or seismic factors that could harm local residents; these could heighten the need for additional protection and drainage works, or even lead to closure of the road in certain sectors. There is also the possibility that conservation and maintenance of the Cotapata-Santa Bárbara segment will be neglected, which would make the situation worse. To reduce these risks: (i) works to correct existing problems have been included in the detailed and/or final designs; (ii) the Bank has advised the SNC to closely supervise conservation tasks entrusted to the firm doing the resurfacing work, to make sure that the segment is duly maintained during the

lifetime of the contract, and that drainage systems are kept in adequate working order, thereby making it possible to combine maintenance works with activities in the program conservation component; and (iii) it is proposed to set up a Reserve Fund for Conservation, and to outsource execution of the preventive maintenance, conservation, and hazard management program over a 10-year period, which is the length of time usually needed for a mountain road of this type to attain stability.