

IMPROVEMENT OF THE SÃO PAULO-CURITIBA-FLORIANÓPOLIS HIGHWAY

(BR-0150)

EXECUTIVE SUMMARY

BORROWER: Federative Republic of Brazil

GUARANTOR: Federative Republic of Brazil

EXECUTING AGENCY: Departamento Nacional de Estradas de Rodagem
[National Highway Department] (DNER)

AMOUNT AND SOURCE: IDB (ordinary capital): US\$ 450.0 million
Local counterpart funding: US\$ 832.6 million
Cofinancing: US\$450.0 million
Government of Brazil: US\$382.6 million
Total: US\$1,282.6 million

FINANCIAL TERMS AND CONDITIONS: Amortization period: 20 years
Disbursement period: 4 years
Interest rate: variable
Inspection and supervision: 1%
Credit fee: 0.75%

OBJECTIVES: The objective of the project is to enhance the level of service of the São Paulo-Florianópolis highway and decrease the accident rate on that thoroughfare. This will help lower transportation costs on the highway, and help achieve the ultimate objective of eliminating a bottleneck to economic and social development of the southern and south-eastern states of Brazil, and the economic integration of that region with the other MERCOSUR countries.

DESCRIPTION: The proposed operation includes investments in works, preparations for possible operation of the highway by concession, and institution-strengthening. The physical components of the project are to build a second roadway for and/or rehabilitate about 617 km of the 690 km of highway between the exit from the city of São Paulo and the entry into Palhoça, close to Florianópolis, and to construct a 43-km divided highway to bypass Curitiba on the east. It also includes the construction of eight tollbooths, four stationary weighscale stations and acquisition of six mobile platform scales.

The Bank will participate principally in the partial financing of the civil works for building divided roadways and highway repair and the supervision

of those works, as well as in the institution-strengthening activities. The federal government will provide the local counterpart funding, and may include therein cofinancing funds that become duly available during project execution. During execution of the works, operation and maintenance of the highway will be granted under concession to the private sector. The concession holder, using its own funds, will be responsible for the construction and procurement of equipment for the tollbooths and truck weigh stations and, subsequently, when tolls are collected, for maintenance and operation of the highway and for emergency breakdown and medical assistance services for users. The concession will be awarded on the basis of the lowest charge proposed by the bidders, including a fixed amount per vehicle to be transferred by the concession holder to the Treasury to cover the payment of interest and amortization of the loan for construction of the highway.

The institution-strengthening component includes: (i) a study of the functions and institutional revamping of the DNER in the medium term; (ii) training courses and activities; (iii) a study of financing of federal and state highways; (iv) studies on the highway's connections with other points of the metropolitan system in the São Paulo area and on its extension from Florianópolis to the southern border of Brazil; and (v) development of a program for the operation of the highway.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environment Committee classified this operation in Category IV. The environmental impact studies have been completed and the respective preliminary summary has been available for public review since July 1995. The project has the prior permits required for all sections, except for the Serra do Cafezal stretch, which is being sought. The environmental summary was approved by the Environment Committee on October 11, 1995.

BENEFITS:

The project will raise the levels of service of the highway at peak hours from the current levels of D, E and F, characterized by severe congestion and frequent highway saturation, low speeds and cycles of braking, standstill and acceleration, to levels A, B and C, fully conducive to normal vehicle operation. A bottleneck in the regional road infrastructure will be eliminated, improving the industrial and commercial economy of the region by removing constraints on transport capacity. Transportation time, costs and accidents will be reduced, particularly those that occur as a result of heavy two-way traffic flows.

Passengers will be ensured safer and speedier journeys, as will the transportation of goods, which is particularly important for the modern sector of the economy and for exporting firms.

RISKS:

The specific risks of project execution, in terms of its physical aspects, are those associated with costs and periods of execution. They relate to potential delays in the processes of bidding, awarding and conducting the works. Potential risks, and preventive measures, are outlined below:

- (i) Protests by unsuccessful bidders. This risk will be minimized by the prequalification of firms. The bidding will be decided on the sole basis of the lowest evaluated offer that substantially complies with the bidding documents for each lot. Nevertheless, groundless protests could occur and cause substantial delays.
- (ii) Protests by businesses that are working on some stretches of the highway in São Paulo, based on previously contracted works that have not been fully completed. This risk has been minimized through a notice of partial termination of the agreement for delegation of sections of the highway to the state, and the transfer of DNER funds to the state by December 31, 1995, to pay for completed works.
- (iii) The possibility that a firm selected will propose a price that subsequently proves to be unfeasible and therefore brings work to a standstill, as was the case in the first stage of dividing the Fernão Dias highway. That risk will be reduced by the requirement that the firm provide a bank guarantee equivalent to 30% of the total value proposed for the work, the same procedure that was adopted when the Fernão Dias works were re-bid, which resulted in prices very close to the estimated costs.
- (iv) Delays in bidding the concession. For example, in the operation and maintenance of the Rio-Niterói bridge and the Dutra highway, protests occurred for the reason outlined above in (i). The measures mentioned there will be used to guard against this eventuality. In addition, the protests were enabled by the lack of specific pertinent legislation as provided for in the 1988 Constitution,

which forced the DNER to rely on previous legislation and legal interpretations that came out of the preparation of the bidding process itself. This problem was eased by the enactment on February 13, 1995, of the Concessions Law. The proposed project is scheduling the concession process for 1996, to ensure a period to resolve any protests that might arise in good time so that the concession holder can install the tollbooths and other works for which it is responsible at the same time as the final phase of the works to add a divided roadway.

- (v) Commercial risks for the highway concessionaire. This risk is being attenuated by providing that transfers of the share of receipts to the state will be reduced if traffic volumes are lighter than forecast. Likewise, the requirement that bidders post performance bonds should lessen the likelihood of unduly optimistic proposals.

**THE BANK'S
COUNTRY AND
SECTOR STRATEGY:**

The Bank's strategy for Brazil sets forth three priorities that are particularly compatible with the proposed operation, contributing to: (i) an increase in productive capacity and a reduction in production and distribution costs in Brazil; (ii) the integration of MERCOSUR; and (iii) the creation of new forms of public sector/private sector cooperation. The project is consistent with points (i) and (ii) in that it would quadruple the present capacity of the highway, removing one of the major bottlenecks to the development of industry in the region and trade with MERCOSUR. It will help bring down the operating costs of vehicles that travel between the major industrial centers of the countries involved. As for point (iii), the form of concession proposed is novel in that it simultaneously reduces the State's responsibility and the private sector's risks, which makes it feasible for both to participate at a reasonable cost to users.

**POVERTY-TARGETING
AND SOCIAL
SECTORS:**

It has been determined that, for purposes of the provisions of the Eighth Replenishment document (AB-1704), the proposed program is not poverty-targeted in geographical terms or in terms of intended beneficiaries, and is not targeted specifically to women.

**SPECIAL
CONTRACTUAL
CONDITIONS:**

As conditions precedent to the first disbursement of the proceeds of the Bank's loan, the borrower, through the executing agency, the DNER, must present: (i) evidence, to the satisfaction of the Bank, that it

has appointed the technical and administrative staff for the Project Management Unit (UGP) and has engaged the consulting services needed to advise the UGP according to the terms of reference agreed with the Bank (paragraph 3.4); (ii) evidence that the process of hiring a consulting firm to develop the São Paulo-Florianópolis highway operation program has been initiated; this will be used as a basis for bidding of the concession, according to terms of reference to be approved by the Bank (paragraphs 3.34, 3.35, 3.36 and 5.18); (iii) evidence that cofinancing from EXIMBANK of Japan, which is currently under negotiation, or from other acceptable sources, has been duly approved (paragraph 2.17); and (iv) evidence of (i) formal notice of termination in full of delegating agreement PG-009/92-00 and agreements PG-395/87-00 and PG-023/91-00 for services and construction work on some stretches of highway that will be encompassed by the proposed project, providing for the transfer to the borrower of all rights associated with the works and services contracts, and (ii) rescission of works and services contracts concluded between the states and the firms under the aforementioned agreements (paragraph 3.23).

With respect to international competitive bidding of the concession planned for ancillary works and operation and maintenance of the highway, the following must be presented to the satisfaction of the Bank: (i) the concession bidding documents, within eight months of signature of the contract; (ii) evidence that the bidding process has been started, within 10 months of the signature of the contract; and (iii) a detailed plan for operation of the tollbooths and effective collection of tolls, within the second year of the term of the loan contract (paragraphs 3.34, 3.36 and 3.41).

If the aforementioned bidding of the concession is unsuccessful, the government will take over contracting of the works envisaged and will provide the services (and incomplete works, if any). Tolls must be collected from the time of final acceptance of the project works, and the borrower must present annually to the Bank, for 10 years from the effective date of the loan contract, satisfactory evidence that the highway toll is actually being collected, indicating in the annual reports the revenues raised thereby (paragraphs 3.41 and 3.42).

Within the fourth year of the loan contract, the DNER must demonstrate to the Bank that weight enforcement of freight vehicles traveling on the highway is in

operation and must present, for six additional years, a report containing the results obtained in the previous year, including statistics on the number of freight vehicles that were weighed at each station, the number and size of excess loads verified and the fines levied on offenders (paragraphs 3.38 and 3.39).

The borrower must present to the satisfaction of the Bank the environmental documentation approved by the corresponding authorities (where applicable), such as: (i) the environmental impact assessment and prior permit for the 30 km of highway traversing the Serra do Cafezal area in São Paulo prior to bidding of the works; (ii) before awarding all project works, the environmental permit for their construction and corresponding Environmental Management Plans (PEGAs) and appointment of environmental specialists to supervise the implementation of the recommended environmental measures; and (iii) within six months following the issuance of environmental permits for all project works, the PEGA for the contingency and emergency plan for operation of the highway (paragraphs 3.10, 3.11, 3.31 and 3.32).

The bidding thresholds above which international competitive bidding or calls for proposals must be used for the contracting of consulting services and procurement for the project are: US\$200,000 for calls for offers for consulting services, US\$350,000 for goods and US\$5,000,000 for construction works (paragraph 3.20).

According to the project execution schedule, only costs incurred from January 1995 for an aggregate amount of up to US\$19,260,000 equivalent can be recognized as charged to the local contribution for: (i) financing of the Project Executing Unit and the consulting firms that will advise it on project administration, for an amount of US\$450,000; (ii) expropriations for US\$100,000; and (iii) costs incurred by the Government of Santa Catarina in investments in reconditioning BR-101 or adding a roadway, covered by transfers of DNER funds, in an amount of up to US\$18,710,000 (paragraph 3.22).

I. FRAME OF REFERENCE

- A. The Brazilian road system, and socioeconomic importance of the São Paulo-Curitiba-Florianópolis highway
- 1.1 Brazil's transportation infrastructure is grossly inadequate, which increases its internal costs and jeopardizes its integration with neighboring countries and trade with the rest of the world. In particular, it has only 17 km of paved highways for every 1,000 km² of land. This is one of the lowest ratios in Latin America, and is beyond comparison with countries such as Germany and the United States, which have ratios 100 and 38 times greater, respectively.
 - 1.2 In 1993, the system of paved highways in Brazil totaled 148,000 km, comprising 82,000 km of state roads, 15,000 km of municipal roads and 51,000 km of federal roads. A process of transferring approximately 15,000 km of the federal system to the states has been launched, through the development of a new National Transport System (SNV), a process that involves negotiation with the states and requires approval of the National Congress. That system will lead to a substantial reduction in federal roads; only those highways that connect state capitals (including the Federal District) and regions, highways with key installations for other modes of transport, those traversing areas of national security, and those that link Brazil to neighboring countries will remain under federal jurisdiction.
 - 1.3 The vast majority of these highways have a single roadway. Divided highways in Brazil are limited to the outskirts of some urban areas, a small group of roads in the state of São Paulo and the highways connecting Rio de Janeiro and the cities of São Paulo and Juiz de Fora.
 - 1.4 The federal highway between the cities of São Paulo and Florianópolis, 690 km in length, constitutes the principal overland transportation infrastructure connecting the eastern part of the states of São Paulo, Paraná and Santa Catarina (see map). The highway has three different numbers: BR-116 between São Paulo and Curitiba (390 km); BR-376 from Curitiba to Garuva on the border between the states of Paraná and Santa Catarina (84 km); and BR-101 between Garuva and Florianópolis (216 km). The stretch of highway included in the operation proposed herein is 660 km in length.
 - 1.5 That highway forms the backbone of a system of federal highways interconnecting the said states with those of Rio de Janeiro and Minas Gerais in the north and, in the opposite direction, with the state of Rio Grande do Sul, interlinking Brazil and the other MERCOSUR countries through other routes in the Brazilian federal highway system. The above-mentioned states are home to a large portion of the Brazilian population and the nation's economic activity, both densely concentrated within a 100- to 300-km strip

along the Atlantic coast. The highway is also an important link with the interior Brazilian states, that have seen major expansion of agricultural activities in recent decades.

B. Physical and operational defects of the highway

- 1.6 Due to the lack of alternative roads to cover short and medium distances, the highway has absorbed virtually all intercity transportation of goods and passengers in the vast area covered by the coastal strip, including São Paulo, Curitiba, Florianópolis and many other intermediate cities or those close to the highway. Since only about 160 km have been made into a divided highway, around 500 km from the beginning of BR-116 in Taboão da Serra, close to the city of São Paulo, to Palhoça, in the area of Florianópolis, consist of a single roadway, with one traffic lane in each direction and, on some steep grades, a precarious third lane. This highway carries 8,000 vehicles per day on uninhabited and mountainous stretches and up to 25,000 vehicles a day in the urban outskirts. This traffic includes a high percentage of trucks and buses, which increase congestion and worsen the level of service. For example, in the city of Registro (SP), 63% of the 15,000 daily vehicles are trucks, 16% buses and only 21% cars. Traffic counts at 20 posts showed that six had a percentage of trucks and buses of 60% or above, and a further five had between 40% and 59%, while only nine posts recorded less than 40%. In addition, because there is no bypass, all this traffic must go through the city of Curitiba, which has a metropolitan region of 2.2 million inhabitants.
- 1.7 As a result of the volume and mix of traffic, many stretches of the highway are congested for most of the day. The presence of so many trucks reduces the speed and volume of traffic flows considerably on rolling and mountainous terrain. Due to the lack of weigh stations, many trucks carry excess loads, destroying the pavement of many sections. The lack of slope protection has also damaged the highway, making for erosion on several critical stretches.
- 1.8 The percentage of buses varies less than that of trucks and cars along the length of the highway, and is typically between 8% and 16%, compared with 21% to 75% for cars and 14% to 63% for trucks. Buses, which have between 48 and 54 seats and occupancy rates of 70% to 100%, therefore carry more passengers than cars.
- 1.9 Heavy truck traffic on an undivided highway inevitably leads to low levels of service, i.e., D, E and F, 1/ characterized by vehicle flows that are progressively slower and less stable. Those levels

1/ Service levels A, B and C correspond to stable flows at speeds that make for economic operation; levels D and E represent unstable flows close to saturation of the highway; and level F denotes intermittent interruption of the flow.

are common on most segments and at most times of the day. Frequently, many stretches of the highway reach level F, with unstable operations, which often causes vehicles to come to a total standstill.

- 1.10 Vehicle operating costs under such circumstances are high, due to the impossibility of maintaining economic speeds and constant stop-and-go waves, with low average speeds. If the present situation persists, between 1998 and 2017 service levels E and F will extend to nearly all sections and times, including night-time.
- 1.11 The highway is so dangerous that it has become known in Brazil as the "Highway of Death". The difficulty in passing slow vehicles along the 530 km of undivided roadway sets the stage for head-on crashes. The heavy traffic makes it difficult for pedestrians to cross the road in the numerous inhabited regions along the highway. In 1994, there were 5,837 accidents, 1,821 of which involved injuries and 385 caused deaths. Multi-vehicle accidents with multiple victims were common. This situation has generated complaints from the families of victims and the communities affected, including frequent demonstrations during which the highway is blocked for hours on end to protest and exert pressure to turn the highway into a dual carriageway.
- 1.12 The best solution to this set of problems is the one suggested in this operation: to build a divided roadway and construct the eastern part of the Curitiba bypass. A divided highway will quadruple the road's capacity along most sections by doubling the road space and replacing two contiguous flows in opposite directions by two one-way streams on separated roadways. This will eliminate head-on crashes and make it easier for pedestrians to cross, when traffic is separated into two distinct, one-way streams. A further enhancement are the highway safety measures associated with the works, as well as planned emergency breakdown and medical assistance services, and better control of speed once a toll system is in place. The dual highway construction will be accompanied by required repair of the existing damaged roadway and additional measures to enhance safety, such as crossways for pedestrians in populated areas. In addition, the necessary measures will be implemented to correct existing problems of erosion and avoid further problems at the sites of the new works.

C. Institutional and administrative situation

- 1.13 The highway is part of the system included in the National Highway Plan (PNV) of federal roads, under the jurisdiction of the National Highway Department (DNER). This was implemented in past decades using funds provided by the Fundo Rodoviário Nacional (FRN), 2/ as was the rest of the federal system and the bulk of the state and

2/ National Highways Fund.

municipal road networks. The FRN was basically funded by taxes on fuels and lubricants, and was dissolved by the 1988 Constitution. At the same time, a significant portion of the DNER's budget today is earmarked to pay back borrowings from earlier times. Through works completed prior to the dissolution of the FRN, around 118 km of the 690 km highway have been turned into dual carriageway.

- 1.14 The highway agencies thus lost both user taxes for expansion of the system and funding needed to maintain it. That measure also quashed the assumption, implicit in the political decision to construct the highways in the system, that they would be properly maintained throughout their useful life. The result, in addition to the increase in cost of operation of the fleet, has been the growing need to restore highways that have become seriously damaged owing to lack of routine and periodic maintenance, which in turn has led to repair costs that exceed maintenance costs many times over.
- 1.15 Owing to the lack of funds to maintain or divide the highway included in the proposed operation, the DNER entered into agreements with the three states involved, stipulating that they could carry out these works. From time to time, when budget funds were available, the federal government complemented the state funds with transfers. However, in the states of Santa Catarina and São Paulo the works are virtually at a standstill, and Paraná's involvement will shortly be completed with the construction of a second roadway on the only section it has been able to undertake to improve: 69 km of BR-376 between Curitiba and the border with Santa Catarina, of which about 43 km have already been made into dual carriageway. Thus, the resumption of works has necessitated a different administrative and financial plan involving the federal government and the IDB, the thrust of which has been supported by the Executive and Legislative Branches.

D. Concessions program and the DNER

- 1.16 In order to prevent deterioration of the country's most important highways, the DNER has launched a Federal Highway Concessions Program (PROCROFE), and there are similar initiatives in some states. The process was initiated on the basis of legislation in effect at the time, and has been consolidated with the approval of Law 8,987 of February 13, 1995, which provides for the concession of services and public works. That law is consonant with the process of concession of works and operation of federal highways, and the DNER has been able to make the calls for bids held before and after the enactment of Law 8,987 compatible.
- 1.17 The process of concession of federal highways has been in effect for five years, but the program was only formally set up in October 1993. Several works have been bid: one - the Rio-Niterói bridge - is now in operation; another concession is in the award phase; contracts are being signed for two; and one is *sub judice*. In

meetings with the project team, private sector representatives indicated that they were unable to build expensive new roads or turn existing single roadways into dual carriageway. Their reasons are the cost of capital in financial markets, extremely high risks, the very long payback period and the amortization terms of loans available to them in Brazil, which run less than eight years.

- 1.18 Nevertheless, the private sector has indicated its interest and capacity to maintain and operate existing highways, in which it would not face the above-mentioned problems. Funds would only be needed to install tollbooths and weigh scales to operate and maintain the road. Simulations conducted during preparation of this operation indicate that a toll affordable to users would cover the concession holder's costs and also a good part of the interest and principal repayments of the IDB loan and prospective cofinancing. Such a scheme would still require an initial outlay by the government, but would ease or eliminate its debt-payment responsibility and resolve the problem of lack of public funds to maintain and operate the highway to the desired standard. It would further establish a direct tie between user fees and the services provided, and serve as a model for future federal and state concessions.
- 1.19 To satisfactorily perform its functions in the medium term, the DNER will need to evaluate its technical and administrative procedures. Such a study is included in the institution-strengthening component of this operation.

E. Linkages with the highway system

- 1.20 The São Paulo-Florianópolis highway is part of a far larger system, the administration and financing of which in the medium and long terms also gives cause for concern. The concession plan described could be applied to turn other highways into dual carriageway, but not for maintenance of the vast majority of the country's highways because it is difficult to collect tolls and due to the light traffic or lack of control of access roads. The Ministry of Transport is investigating alternative sources of financing for this sector, which will be complemented by a study of the amount required by the DNER and the states, and alternative sources of funds, as part of the institution-strengthening component of this operation.
- 1.21 In the next few years, integration with MERCOSUR will necessitate investments to upgrade the highway from Florianópolis to the southern border. There is as yet no feasibility study of alternatives for the routing or engineering plans for this section; accordingly, those studies have been included in the proposed operation.

F. The Bank's experience with the DNER

- 1.22 The Bank has financed eight projects for the construction, improvement and expansion of federal highways in Brazil, for a total amount of US\$563.5 million. Six of these were approved more than 20 years ago (the last of the group in 1974) and were fully executed in conformity with preestablished standards, designs and specifications, with the sole exception of the second stage of the Rio de Janeiro-Santos highway, in which US\$22 million of a total approved of US\$36 million was canceled due to lack of local counterpart funding. In the last 20 years, only two federal projects have been financed: improvement of the first stage of the Porto Velho-Rio Branco highway (1985) and modernization and expansion of the Fernão Dias highway (1993), corresponding to part of the section located between São Paulo and Belo Horizonte. In the first case, the highway works were concluded and the completion period for the environment and indigenous communities component was extended; in the second case, changes stemmed from the "Plano Real", leading to the suspension of contracts and re-bidding of the works, which has been successfully conducted and will enable work to resume shortly.

G. The Bank's strategy and rationale for its participation

- 1.23 The Bank's strategy for Brazil includes three priorities that are especially compatible with the operation proposed, contributing to: (i) an increase in the productive capacity and a reduction in production and distribution costs in Brazil; (ii) integration with MERCOSUR; and (iii) the creation of new forms of public sector/private sector cooperation. The project is consistent with points (i) and (ii) in that it would quadruple the present capacity of the highway, removing one of the principal bottlenecks to development of the region's industry and to trade with MERCOSUR. At the same time, the operating costs of vehicles between the major industrial centers of the countries involved would be reduced. As for point (iii), the form of concession proposed is novel in that it simultaneously reduces the State's responsibility and the private sector's risks, which makes it feasible for both to participate at a reasonable cost to users.

II. THE PROJECT

A. Objectives

- 2.1 The ultimate objective of the project is to contribute to the economic development of the southeastern and southern states of Brazil and to the economic integration of that region with the other MERCOSUR countries. Its specific purpose is to raise the level of service of the São Paulo-Curitiba-Florianópolis highway and bring down the accident rate on that highway, all of which will help reduce the highway's transportation costs.

B. Targets

- 2.2 The targets outlined below will be achieved as the different components of the project enter into service (see Logical Framework for the project, Annex II-1):
- a. The levels of service of the highway, which in December 1994 were D, E and F during peak hours, by December 1999 will improve to categories A, B and C on the critical sections corresponding to the following traffic counting posts: (i) posts 2, 3 and 4 on BR-116; (ii) post 10 on BR-376; and (iii) posts 12, 14 and 16 on BR-101. Those service levels are defined in the Highway Capacity Manual (1994) in terms of speed and volumes of traffic flow, which are key determinants of operating costs.
 - b. Execution of the proposed project will lead to a 30% reduction in fatal accidents and accidents with injuries by 1999, measured per million vehicle-km, compared with 1994. The 1994 accident statistics for this highway were as follows: accidents with deaths 385; with injuries but no deaths 1,821; and with no deaths or injuries 3,631. As of 1999, the rates of fatal accidents and those causing injuries, measured per million vehicle-km, will not increase.

C. Project description

- 2.3 The principal physical components of the project are interventions (maintenance, construction of an additional roadway and/or restoration) on close to 617 km of the highway linking São Paulo to the Palhoça exit in the area of Florianópolis, and the construction of 43 km of divided roadway to bypass Curitiba. Additional components include the installation of tollbooths and truck weigh stations, emergency breakdown and medical assistance services, studies, and other activities to strengthen institutional aspects of the national highway administration. The infrastructure resulting from this component will be a divided highway (two roadways, each with two lanes) and a total of four completely new or restored traffic

lanes, between km 298.4 in São Paulo to km 568.8 of BR-116 on the Paraná border, from km 0 to km 72.8 of BR-116 in Paraná, on the 43 km of the Curitiba eastern bypass, between km 635.6 and km 704.8 of BR-376 in Paraná, and between km 0 and km 216.5 of BR-101 in Santa Catarina.

- 2.4 To this end, the project includes investments in works, preparations for operation of the highway under concession, and institutional actions. The works comprising the investments are described in broad outline below. The first stage consists of construction of an additional roadway or restoration of the existing highway and will be conducted by the DNER under a financing scheme that combines resources allocated by the federal government, the proposed loan from the IDB and, probably, cofinancing. The second stage consists of investments made by a concession holder when the first stage is nearing completion. The concessionaire will provide the tollbooths and truck weigh stations and will be responsible for providing emergency breakdown and medical assistance services, as well as for maintaining the highway. The studies component includes planning the divided highway up to a point on the border in the direction of Buenos Aires, with basic engineering specifications for the first section; an operating plan of the roads connecting São Paulo with BR-116; a study of financing of federal and state highways; a study of the functions and institutional revamping of the DNER; a highway operation study; and training of personnel of the DNER and other transportation agents from the public and private sectors.
- 2.5 The following costs have been included for the preparation and administration of the project:
 1. Engineering and administration (US\$48,170,000)
 - a. Engineering (US\$880,000)
- 2.6 The engineering tasks planned will encompass development of the final design and of the bidding documents of the works on the 30-km section traversing the Serra do Cafezal area, between km 337 and km 367 of BR-116 in São Paulo, pursuant to the recommendations of the studies conducted, including restoration of the existing roadway and construction of a separately routed new roadway, with 1,360 m of concrete structures (bridges and viaducts) and 1,600 m of tunnels.
 - b. Supervision (US\$36,000,000)
- 2.7 This item covers the supervision and technical monitoring of works in the field, that will be performed by the DNER districts in São Paulo, Paraná and Santa Catarina, aided by consulting firms specializing in highway engineering. The item refers only to costs associated with the consultants, and is equivalent to 3.8% of the direct costs of the works.

c. Administration (US\$11,290,000)

- 2.8 This heading includes the costs of personnel assigned to the Project Management Unit (UGP) (see description in Chapter III) that will be set up in the DNER to administer the project, as well as the costs of other DNER offices that will lend administrative, accounting and legal support for the project's execution. It also includes the equivalent of US\$8,590,000 for support services to the UGP, provided by a consulting firm which will constitute the technical advisory service of the UGP.

2. Specific components (US\$979,690,000)

- 2.9 This heading covers the investment in highway restoration and additional roadway construction, and preparations for the highway to be operated under concession to private enterprise. These costs were evaluated based on quantities of work items to be executed derived from the engineering designs, to which unit prices considered acceptable by the DNER have been applied.

a. Component I (US\$837,080,000)

- 2.10 These are the direct costs of building additional roadways and highway restoration included in the project, with: (i) rehabilitation of pavement on approximately 516 km of undivided roadway and a further 88 km of existing dual carriageway, with two traffic lanes on regular stretches and three lanes on uphill sections; (ii) construction of a second roadway running some 459 km, of which 419 km are parallel to the existing roads and 40 km follow a separate route in mountainous regions, for the most part with two lanes, and the corresponding concrete structures required, including around 2,500 m of tunnels; and (iii) construction of a dual carriageway section 43 km in length to partially bypass the urban core of the city of Curitiba, including special masonry structures. This package of works includes earthwork for preparation for construction of eight toll stations (the concession holder will be financially responsible for construction of the superstructure of the stations).

b. Component II (US\$98,920,000)

- 2.11 This item comprises the direct cost of works that will be executed by private initiative before the highway begins to operate under concession. This component, outlined in Annex II-2, includes the following works that are incorporated in the engineering designs: the direct costs of bridge widening (US\$19.8 million); road signs, pavement markings and safety features (US\$35.3 million); and lighting (US\$15.5 million). Among the costs not included in the engineering plans prepared by the DNER are the works for construction of the superstructure of eight toll stations, and ancillary works for four weigh scales to control truck weight and loads, for an estimated amount of US\$28.3 million.

c. Indirect costs (US\$32,830,000)

- 2.12 The indirect costs cover the acquisition of rights-of-way above and beyond the existing easements at specific locations, and implementation of environmental protection measures in general (both mitigating and offsetting), as agreed with the environmental agencies. These include the strengthening of protected areas, improvement of management capacity for areas of urban and tourism expansion in the service area of the highway, the recovery of degraded areas, erosion control, monitoring, preservation of archaeological heritage, social and health programs, and support for indigenous communities (see paragraph 3.33).

d. Studies component (US\$10,860,000)

- 2.13 The studies and institutional component would include: (i) a study of solutions for interconnection of BR-116 and the *Avenidas Marginais* along the Pinheiros and Tietê rivers in São Paulo, and preparation of an operating plan for the alternative selected; (ii) a prefeasibility study of alternatives for constructing divided highways to connect the São Paulo-Curitiba-Florianópolis highway with a point on the border in the direction of Buenos Aires; this will give the government cost and benefit information for different scenarios of improvements in the Argentine and Uruguayan highway systems, to assist in intergovernmental negotiations on cross-border highway linkages; (iii) technical, economic and environmental feasibility studies, with the development of a basic design and bidding documents for the first section of the alternative identified in the aforementioned study; (iv) a financing study of federal and state highways; (v) a study of the functions and institutional revamping of the DNER in the medium term; (vi) development of a program for operation of the highway, to be used as a basis for bidding the concession; and (vii) short training and development courses for personnel of the DNER, the Ministry of Transport and other interested parties, including the private sector.

3. Other costs (US\$255,140,000)

a. Contingency and escalation costs (US\$118,130,000)

- 2.14 Contingencies are estimated at 5.8% of the direct project costs (3% on expropriations and environmental measures, 5% on additional roadway construction and restoration work and 10% on costs of the Serra do Cafezal section, in the vicinity of São Paulo). Escalation was estimated using domestic inflation and exchange rate indexes used for projects in Brazil.

b. Finance charges (US\$136,570,000)

- 2.15 These costs include estimated interest during construction based on an interest rate of 7% per annum, a credit fee of 0.75% on

undisbursed loan balances, and an inspection and supervision fee of 1% of the loan. The following values were adopted for the same parameters for the case of cofinancing: interest 3.5% per annum, credit fee 0.5%, inspection and supervision 0.1%.

D. Project cost and financing

- 2.16 The total project cost will be US\$1,282.6 million equivalent, to be financed as follows: (i) up to US\$450 million with Bank resources from the ordinary capital, to finance 43.7% of the direct costs of restoration and construction of an additional roadway on the highway (see Annex II-2); 50% of the costs of supervision and technical monitoring of the new roadway and restoration works in the state of São Paulo; 50% of the costs of mitigating environmental measures; 50% of the costs of three of the proposed studies; 100% of the costs of inspection and supervision charged by the IDB, and 21.7% of the total contingent costs; (ii) up to US\$450 million equivalent with cofinancing resources from EXIMBANK of Japan, currently under negotiation, that would finance 43.7% of the direct costs of dual-roadway and restoration work (see Annex II-2); 50% of supervision and technical oversight of the new roadway and restoration work in the state of São Paulo; 50% of the cost of measures to mitigate environmental impacts; 50% of the cost of three of the proposed studies; and 25.5% of total contingent costs; and (iii) US\$382.6 million equivalent from the federal government's own resources, to complement the investments and studies financed by the Bank and by EXIMBANK of Japan and cover interest payment during construction, the credit fee of both institutions, and supervision and inspection of the works financed by EXIMBANK of Japan. With the concession of the highway, the private sector is expected to execute works worth US\$102.9 million with its own funds, including contingencies and escalation, thereby reducing the government's share by that same amount.
- 2.17 For the purposes of analysis of this project, it was considered that the local counterpart would come exclusively from the federal government through the allocation of resources to the DNER. However, those allocations could drop to only US\$279.7 million if concession of the highway to private hands is successful. Moreover, as the financing with EXIMBANK of Japan is still under negotiation, a condition precedent to the first disbursement of the Bank's loan should be that the borrower demonstrate to the Bank's satisfaction that this cofinancing or other acceptable sources have been duly approved. In this regard, the Ministry of Transport, in its consultation with the country's External Financing Commission (COFIEIX), has indicated that the Brazilian government will ensure allocation of the local counterpart resources to complete project execution, should the cofinancing fail to materialize.
- 2.18 The cost table below indicates the project components and their sources of financing:

PROJECT COST TABLE
(in thousands of U.S. dollars)

	BANK	COUNTERPART		TOTAL	SHARE %
		COFIN.	GOVT.		
1. ENGINEERING AND ADMINISTRATION	7,530	7,540	33,100	48,170	3.76
1.1 Engineering			880	880	0.07
1.2 Supervision	7,530	7,540	20,930	36,000	2.81
1.3 Administration			11,290	11,290	0.88
2. INVESTMENT COMPONENTS	409,360	409,360	117,280	936,000	72.98
2.1 Component I	409,360	409,360	18,360	837,080	65.27
2.2 Component II			98,920	98,920	7.71
3. INDIRECT COSTS	2,250	2,240	28,340	32,830	2.56
4. STUDIES OF SOLUTIONS	700	710	9,450	10,860	0.85
5. CONTINGENCY AND ESCALATION	25,660	30,150	62,320	118,130	9.21
5.1 Contingencies	11,840	13,910	28,760	54,510	4.25
5.2 Escalation	13,820	16,240	33,560	63,620	4.96
6. FINANCE CHARGES	4,500		132,070	136,570	10.65
6.1 Interest			124,770	124,770	9.73
6.2 Credit fee			6,850	6,850	0.53
6.3 Inspection and supervision	4,500		450	4,950	0.39
7. GRAND TOTAL	450,000	450,000	382,560	1,282,560	100.00
8. Percentage	35	35	30	100	

- 2.19 The Bank's contributions, added to the resources being negotiated with EXIMBANK of Japan, will finance around 87.4% of the direct construction costs. Annex II-2 contains a tentative list of groups of works that could be 100% financed with cofinancing funds (in the state of São Paulo), and those that could be executed by the private sector using its own funds. In both cases, the selection criterion is that the IDB funds will be used basically for the construction works that are started first (in Paraná and Santa Catarina), so as to avoid delays in the schedules owing to inability to obtain cofinancing or occasioned by the concession process.

E. Concession arrangements

- 2.20 Among the various possible forms of cooperation between the public and private sectors to provide and operate road works, the project envisages a form of concession that takes into account the constraints faced by investors, users and the government. The process is based on the Concessions Law mentioned earlier (paragraph 1.16).

- 2.21 The concession conditions will establish a fixed amount, by type of vehicle, to be built into the toll charge and transferred by the concession holder to the government to defray its costs, including interest and principal of the loan (or loans, in the case of cofinancing). As an illustration, consider a fixed sum of US\$1.00 and a toll of US\$2.50 (the lowest charge proposed by the successful bidder), both for cars, and charged at each of the eight toll stations during the life of the concession. The concessionaire will pass on US\$1.00 to the government and will retain US\$1.50 to cover its own costs and earn a profit. The toll and the amount earmarked for the government will be periodically adjusted to offset inflation. The government's share will be eliminated and the toll charge decreased by the same amount if and when the monies effectively received by the government compensate for all outlays, including loan interest and amortization.
- 2.22 Such a system encourages the participation of private concession holders, who state that they face real annual interest rates on the order of 12% to 20% and financing terms invariably of less than eight years. It reduces the initial outlays of the concession holder to those needed for installation of tollbooths and other necessary works and equipment for operation of the highway, and shortens the interval between the investment and the start of toll operations, which reduces the costs and risks considerably. Under the scheme proposed, the concession holder is not responsible for the government's debt acquired for construction of the highway, but acts as its collection agency. If traffic is lighter than forecast, it will take longer for the government to receive the amount equivalent to its total actual payments on the loans, and the concessionaire will only be adversely affected by the smaller receipts for its share of the charge. If traffic is heavier than anticipated, the government will receive the amount equivalent to loan interest and amortization quicker and the concession holder's profits will increase.
- 2.23 The scheme also considerably reduces public costs of construction, maintenance and operation (entirely undertaken by the private sector) and debt payment. The burden of costs of interest, amortization, maintenance and operation is transferred from the government to users. According to the interpretation of the DNER's Legal Department, however, the toll may not be used to compensate the government for its costs during construction. Those costs are considered to be financed from taxes, and charging a toll to recoup them is equivalent to double taxation.
- 2.24 Users require a toll system in which (i) the flow of vehicles is not held up by the collection process; (ii) the toll helps ensure maintenance and safety on the highway; and (iii) the amounts charged are reasonable. With respect to point (i), local traffic in urban areas in which there is no room to install the necessary tollbooths is excluded. Point (ii) is addressed by the technical requirements of maintenance and provision of emergency breakdown

and medical assistance that the concession holder is obliged to provide.

- 2.25 With respect to point (iii), the studies for the concession have calculated the amount of US\$2.50 for cars as sufficient to cover the concession holder's costs and pay the IDB loan (the toll would be proportionally higher for trucks and buses in direct relation to their number of axles) at each of the eight stations on the highway. This would amount to US\$20 for the entire length or approximately US\$0.03 per km. This sum is considered reasonable in relation to three reference points: (a) about US\$0.03 to US\$0.04 is charged per km for cars in the freeway system operated by the public enterprise Desenvolvimento Rodoviária, S.A. (DERSA) in the state of São Paulo; (b) in the United States, rates vary from US\$0.04 to US\$0.08 per km on comparable sections in which the user pays for the interest during construction (and not only maintenance); and (c) the amount is less than the cost of fuel used on the section, equivalent to US\$0.06 to US\$0.10 per km for a car. If the cofinancing is confirmed, it is estimated that a toll of approximately US\$3.50 would cover the higher level of costs, equivalent to US\$0.04 per km approximately, and still be affordable.

III. PROJECT IMPLEMENTATION

A. The borrower and the executing agency

- 3.1 The Bank's financing will be granted to the Federative Republic of Brazil. The DNER will be the executing agency. This decentralized agency, connected with the Ministry of Transport, is responsible for planning, coordination, execution, administration, control and maintenance of the federal highway system. The DNER's institutional and financial capacity is analyzed in chapter IV of this document.
- 3.2 The project works will be executed by specialized construction companies contracted by the DNER. Supervision of those works will be conducted by the Federal Highway Districts of São Paulo, Paraná and Santa Catarina that form part of the DNER's organizational structure, with support from consulting firms hired by the DNER for that purpose. To complement this structure, pursuant to Ministry of Transport/DNER Directive 1,148 of October 23, 1995, a Project Management Unit (UGP) was set up at DNER headquarters in Brasília, reporting to the director general of that agency.
- 3.3 The function of the UGP will be to plan, coordinate, monitor and control all project activities during the period of execution. It will coordinate information and other elements received from the units responsible for the project in the DNER districts of São Paulo, Santa Catarina and Paraná. In addition, the UGP will report to the Bank on all aspects of project progress, and will receive technical and administrative support from a consulting firm specializing in project management to be hired by the DNER.
- 3.4 As a condition precedent to the first disbursement of the Bank's loan, the borrower, through the executing agency, must present evidence, to the satisfaction of the Bank, that the DNER has appointed the UGP's staff and has hired the necessary consulting services to advise the UGP, pursuant to terms of reference acceptable to the Bank.
- 3.5 This arrangement has been examined by the Bank, and is consistent with the installed capacity of the executing agency and the requirements of the project. Furthermore, the DNER has taken measures for setting up the UGP within the formal structure of its headquarters in Brasília and of the districts in the states directly involved in the project.

B. Status of preparation of the project

- 3.6 The engineering designs for constructing an additional (divided) roadway for this highway were prepared in the 1970s and 1980s, with subsequent revisions in 1988 and 1989 for the BR-116/SP/PR section.

However, in 1995, all designs were again revised, with a redistribution of construction lots, a new budget estimate and inclusion of services to restore the existing roadway. The design of the divided highway along 30 km in the Serra do Cafezal area, between km 336.7 and 367.2 of highway BR-116, has yet to be adjusted to the final route selected based on the specific environmental features of this stretch. Lots 20 to 23 of the section of highway BR-116 in the state of São Paulo, with a length of 39 km to be made into dual carriageway, need to be reassessed by the DNER to determine the quantities of work already carried out by the Highway Department of the State of São Paulo.

- 3.7 By the date of presentation of this report to the Board of Executive Directors of the Bank, all designs and bidding documents of the various sections will be available, except for the section in Serra do Cafezal and the 39 km of highway BR-116 in the state of São Paulo in the most built-up areas. The bid documents for these stretches will be prepared by the first quarter of 1996 in the case of São Paulo, and by the third quarter of 1996 for Serra do Cafezal. All of the surveys, hydrology, geotechnical, and environmental studies, and other studies required for the type of works envisaged in this project, which were needed to draw up the aforementioned technical documents (including those for Serra do Cafezal, which already has preliminary designs at a suitable level of detail) were conducted. Thorough borehole tests were done (specifically for bridges, viaducts, and tunnels) to study sections and profiles of foundations, soil, and rock to be excavated or perforated. The Bank has reviewed all these studies and technical documents and found them to be sufficient and adequate.
- 3.8 The project has the required socioeconomic viability studies (analyzed in chapter V). Terms of reference for engaging support services for the Project Management Unit, for supervision of the works, and for other studies and consulting services required for the project are being discussed with the Bank on the basis of general guidelines agreed upon with the project team. The final version of the terms of reference is to be presented to the Bank before each tendering process begins, in accordance with the execution timetable.
- 3.9 The DNER has a detailed preliminary report on the properties that will be affected by expansion of the rights-of-way of some stretches and by the construction of the divided roadways when these do not follow the previous route. This work was conducted during the updating and review of the projects in each of the states. For this purpose a physical survey of the properties was conducted, as was an investigation into their legal status. On this basis, a sequenced cadastral list was prepared that forms part of each project execution plan approved by the DNER.
- 3.10 Environmental impact assessments (EIAs) were prepared for all sections of the highway (in different stages); the corresponding

environmental reports (RIMAs) were submitted for public review and approval by the competent state and federal environmental authorities. The environmental permits required prior to tendering of the works were obtained for all highway sections except for the 30-km section in Serra do Cafezal, São Paulo, which crosses an area of Atlantic matto, one of the most biologically diverse and endangered forests in the world. The EIA and preliminary environmental permit from the state authorities of São Paulo must be presented to the Bank prior to bidding of the works. The environmental summary for the project was approved by the Bank's Environment Committee at its meeting on October 11, 1995.

- 3.11 The environmental impact studies have defined a series of mitigating and environmental recovery measures (slopes, borrow pits, quarries) which will be incorporated (in terms of technical detail, financial cost and administrative and supervisory responsibility) into the information for bidders and the construction contract. These measures will form part of the Environmental Management Plan (PEGA) for each works project or package of works. It will be a condition of the loan contract that the PEGA be submitted to the state environmental authorities and the Bank for consideration before the environmental permit for the works is granted.

C. Rights-of-way

- 3.12 The planning of the expansion and improvement of the São Paulo-Florianópolis highway sought to maintain its routing within the current right-of-way strip, consistent with the technical and environmental preservation standards and conditions. However, along some subsections alternative alignments and widening have been planned that will require the acquisition of additional land. There are sections of route change, such as the 43 km around Curitiba, and the separate second roadway for the 12-km alignment change at Alpino, in Paraná, 27 km in Serra do Cafezal in São Paulo, and at isolated points where there will be intersections, accesses and urban crossroads. In the case of Paraná, to obtain a final report on the properties that would be affected, with their respective legal status and costs, the DNER will hire a consulting firm to draw up an expropriation plan starting in the fourth quarter of 1995. According to preliminary data available, there will be no massive relocation of persons but only compensation for land and properties, which will be funded by counterpart resources. In the other sections, where there are isolated expropriations, the process would be initiated through the consultants responsible for works supervision.
- 3.13 The process of acquisition of land for rights-of-way for roadwork in Brazil is expeditious and allows immediate possession of the land required even if the expropriation procedures are not completed. This process takes place through the issuance of an edict by the Director General of the DNER declaring a project to be in the public interest. Nevertheless, in accordance with Bank

policy, before calling for bids on any of the highway sections or elements of the project, the borrower must demonstrate that it has legal possession of any land, in addition to the land already available, that may be needed for execution of any of the project works.

D. Tendering and execution procedures

- 3.14 The project works will be executed by construction contractors hired in all cases using the Bank's international competitive bidding and prequalification procedures, which will constitute Annex B to the loan contract.
- 3.15 For the purposes of bidding and contracting, the project works have been divided into five groups, according to their execution schedule, with a total of 49 construction lots. The first group includes 15 sections in Santa Catarina, approximately 184 km in length and two lots of special concrete structures. The second group includes nine sections in Paraná, including two for special concrete structures, two sections in Santa Catarina (including one for special concrete structures) for a total of 11 sections, approximately 214.6 km in length. The third group comprises 17 sections, including eight lots of special concrete structures, for approximately 187.2 km in the state of São Paulo. The fourth group has four lots in São Paulo for 43.7 km. The fifth group is the Serra do Cafezal section in São Paulo with two lots and 30 km total length. Annex III-1 presents a list, estimated cost, and probable dates of these calls for bids.
- 3.16 To speed up construction and elicit a larger number of offers, the bidding documents allow bidders to present alternative proposals to execute one or more of the lots bid, up to a maximum of three lots per construction firm. The contract will be awarded on the basis of the lowest evaluated bid that substantially complies with the bidding documents for the package of lots. This procedure will allow for participation of large and medium-sized enterprises from Brazil or abroad. However, to be awarded two or more lots, a firm must provide clear documentary evidence that it has the personnel, equipment and funds to simultaneously complete the sections within the construction periods stipulated.
- 3.17 Although the project works are relatively large in volume, they are standard highway engineering works, for which the technology is available in Brazil and abroad. Consequently, no technical problems are anticipated in project execution.
- 3.18 As already stated, supervision and technical quality control of the works will be conducted by highway engineering consulting firms, contracted exclusively for that purpose. These firms will carry out their work based on terms of reference previously accepted by the Bank. The consulting firms to be hired to supervise the 2,500 m of tunnel construction must demonstrate that they are

qualified to supervise highway works and structures, and have sufficient experience in the supervision of tunnels similar to those planned.

- 3.19 The consulting services indicated (with the exception of supervision of the sections in the state of São Paulo, that will be financed by the Bank), as well as the engineering work, support for the UGP, studies of solutions, expropriations and the highway operation program, will be awarded to engineering firms following the procedures stipulated under current Brazilian legislation and the general procurement principles of the Bank, and their cost will be fully covered by local funding. However, the terms of reference on which the respective contracts are to be based, subject to Bank approval prior to the start of the contracting procedures, will state the minimum personnel needed, the engineering equipment and laboratories required, the nature and frequency of technical and administrative controls and the content and frequency of reports. Before proceeding to hire the services, the borrower, through the executing agency, must inform the Bank of the names and references of the firms selected and the price (see Annex A to the contract).
- 3.20 Procurement and contracting of the designs and works to mitigate adverse environmental effects; studies of the operational plan of the exit from São Paulo, the financing of highways, and institutional revamping of the DNER; and the supervision of construction of the sections in the state of São Paulo that will be financed by the Bank, will be governed by the procedures set forth in Annexes B and C to the loan contract. International competitive bidding will be obligatory for consulting contracts greater than US\$200,000, for goods procurement above US\$350,000, and for construction works worth over US\$5,000,000. These thresholds are justified in that in similar projects in Brazil no foreign bidders participated for amounts below those values. Calls for tenders involving smaller amounts will proceed in accordance with Brazilian legislation, which requires competitive bidding when the amount is above US\$1,370,000 for works and allows limited bidding or price quotations for smaller amounts. In the case of goods, procurement worth less than US\$350,000 equivalent may be arranged via bidding or price quotations.

E. Recognition of previous expenses

- 3.21 The agreements signed with the states, mentioned in paragraph 1.15, provided for the execution of works and, in the case of São Paulo, subsequent operation of the highway, but the work was not completed and the respective contracts are to be terminated. There are ongoing works on short sections of BR-101 in Santa Catarina and on 26 km of BR-376 in Paraná. These states will undertake to complete these works, respectively, by the end of 1995 and during the first quarter of 1996. Paraná has guaranteed funds to complete the dual carriageway of BR-376 up to the Santa Catarina border, and Santa

Catarina will use only the resources slated to be transferred from the federal government to complete works through December 1995.

- 3.22 For this reason, in accordance with the execution schedule for the project proposed herein, costs may only be recognized that are incurred in 1995 for a total of up to US\$19,260,000 equivalent, against the local contribution, for: (i) financing the executing unit of the DNER and the consulting firms that will advise it on project administration, for US\$450,000; (ii) expropriations for US\$100,000; and (iii) costs incurred by the Santa Catarina State Highway Department as of January 1995 for construction of an additional roadway or repair of BR-101, covered by transfers of funds from the DNER, for up to US\$18,710,000. For the procurement envisaged in this operation, the procedures provided for in Brazilian legislation were used, which are acceptable to the Bank.

F. Advance tendering of works and contracting of services

- 3.23 The existence of an agreement with São Paulo (see paragraph 1.15) with uncompleted service contracts on some sections might impede the start of construction by the DNER. Furthermore, as that agreement provided for operation by the state, it would prevent concession of the highway to private enterprise. For that reason, the DNER reworked the agreement, removing the section pertaining to operation of the highway and leaving intact the delegation of construction only for segments for which negotiations are being concluded to rescind contracts with the construction firms. Since the DNER's agreements with the states of Paraná and Santa Catarina provided only for construction of some stretches of the highway, the problem of authority for the entire highway reverting to the federal government is resolved, and this loan operation with the Bank can proceed. Nevertheless, to ensure that the existence of these agreements and contracts executed thereunder will not cause problems for construction work or subsequent concession of the highway, it will be a condition precedent to the first disbursement of the loan that the borrower, through the executing agency, demonstrate to the Bank that it has given formal notice of termination in full of the agreements with the states, which have transferred to the DNER the rights associated with the works and services contracts, and that such contracts have been rescinded.
- 3.24 In addition, to enable part of the IDB-financed project works to begin in the first half of 1996, it has been agreed with the Brazilian authorities that tendering of those works will begin before approval of the loan being requested, on condition that the DNER submit the following to the Bank's satisfaction: (i) the bidding documents, and (ii) evidence that it has reworked the agreement it had concluded with the state in which the new works are to be built, setting precise dates for ending services previously contracted, in accordance with the proposed project's execution timetable, and for the rescission of those contracts, so work can begin with no risk of protest by any contractor previously

involved. The process of bidding the project works will be initiated by the DNER, complying in every case with the Bank's rules and procedures.

- 3.25 The first works to be initiated are in the states of Paraná and Santa Catarina. Since the firms supervising these works must be engaged and on site before the construction contractors, their hiring must take priority in the DNER. This process has already been completed in the case of Santa Catarina and the Curitiba bypass, and is slated to commence for the remaining sections in Paraná before approval of the loan. Similarly, to ensure completion of the necessary organization for administration of the project and initiation of those works, the DNER will launch the bidding process for hiring the consulting firms that will advise the UGP prior to the loan approval date, and expects to contract them in 1995. In all these cases, the firms will be hired using local counterpart funds, in conformity with Brazilian legislation and the terms of reference approved by the Bank.

G. Implementation period and investment schedule

- 3.26 The period of project execution will be four years from the effective date of the loan contract. This term is compatible with the type and volume of project works, with the construction procedures to be adopted to maintain the normal flow of existing traffic and with the institutional capacity of the executing agency, as well as the capability of the National Treasury to make the required local contribution.
- 3.27 Annex III-1 shows the tentative tendering schedule of the various project sections, based on which the investment schedule included in Annex III-2 has been drawn up, and is summarized below:

SOURCE	PRIOR COSTS	1996	1997	1998	1999	TOTAL
IDB		148,230	222,900	71,560	7,310	450,000
Cofinancing		149,260	223,810	70,720	6,210	450,000
Government	19,260	82,220	102,270	103,610	75,200	382,560
TOTAL	19,260	379,710	548,980	245,890	88,720	1,282,560
% IDB		39	41	29	8	35
% Cofinancing		39	41	29	7	35
% Government	100	22	18	42	85	30

H. Advance of funds

- 3.28 Based on the scheduled pace of execution of project works, at the express request of the borrower, funds may be advanced from the Bank's loan for up to the equivalent of 10% of the loan amount.

I. Execution of planned environmental measures

- 3.29 The Environmental Management Plan (PEGA) for each works project or package of works will include a series of measures to offset the direct and indirect effects on the environment, in order to strengthen protected areas and enhance the capacity to manage areas of urban and tourism expansion in the service area of the highway. Under specific agreements with the environmental authorities of the states of São Paulo, Paraná and Santa Catarina, the executing agency of the program has undertaken to provide from 0.5% to 1% of the total direct cost of the works (between US\$4.68 million and US\$9.36 million) to strengthen protected areas directly and indirectly affected by the program. These costs are part of the total project cost, and the executing agency's commitment is a contractual condition of the loan. Each PEGA is required prior to approval of the environmental permit for the respective works.
- 3.30 In accordance with the PEGA, during construction the following activities will be conducted: (i) control of dust and vehicle emissions; (ii) control of erosion; (iii) control of landslides and cave-ins; (iv) recovery of degraded areas and improvement of rights-of-way; (v) afforestation and recovery of plant cover; (vi) worker settlements and worker safety measures; (vii) conservation and salvaging of archaeological remains; (viii) support for indigenous communities; and (ix) compensation and expropriation of property affected. For the entire stretch of the São Paulo to Florianópolis highway, the estimated sum for the implementation of mitigating measures (i) through (viii) is US\$4,490,000 and for (ix) is US\$23,530,000. US\$4,810,000 is estimated for the cost of compensatory measures. The final budget for that item will be obtained during the detailed preparation of the PEGA to secure the necessary installation permits to commence construction.
- 3.31 The PEGA will include a component of environmental supervision and monitoring. There is provision for the inclusion of environmental specialists in the executing unit of the program (to strengthen coordination) and in the state districts of the DNER (to assure execution and monitoring), funded by the program, as well as verification of the capacity of the firms supervising the works to monitor the environmental protection features of the program. This component to strengthen environmental management capacity is a contractual condition of the program, to be performed within six months after approval of the environmental permit for installation of the corresponding works.

- 3.32 A contingency and emergency plan for accidents and transportation of hazardous loads along the São Paulo-Florianópolis highway will be an integral part of the PEGA, and its implementation is a contractual condition.

J. Concession for highway operation and maintenance

- 3.33 The DNER is responsible for the operation and maintenance of federal highways. In line with the agency's new policy of involving the private sector in these activities, the operation and maintenance of the São Paulo-Florianópolis highway will be executed by concession of the specific services to private enterprises, which will collect tolls for use of the highway under the supervision of the DNER's divisional offices.
- 3.34 An international call for bids will be held for this concession, the preparation of which requires the services of a consulting firm to draw up a São Paulo-Curitiba-Florianópolis highway operation program on which the concession will be based. The program must consider two horizons: (i) the immediate future, i.e. the period in which the minimum requirements for initiating toll collection are met, which coincides with the final stage of the construction and restoration of the highway by the DNER and with the execution of ancillary works by the concession holder; and (ii) the long term, i.e. the continuous period through to the end of the concession.
- 3.35 The firm hired to develop the above-mentioned program will also draw up the terms of reference for a standard toll rate proposal. Items to be covered therein are operating and capital costs, financial schedules, reporting of income, financing data, insurance and guarantees, and accounting and financial statements. The program will indicate the basic timetables that the bidders must follow in their proposals, the services needed for execution and to meet the objective of the concession, and the available traffic studies (to guide bidders). The maximum admissible traffic volume equivalent will be established. 3/
- 3.36 The terms of reference for the consulting firm's work must be submitted to the Bank and the contracting process must be initiated before the first disbursement. The program devised must be satisfactory to the Bank, as must the bidding documents for the concession, which will be presented to the Bank within eight months of signature of the contract. The DNER must present to the Bank, 10 months following contract signature, evidence that the process of bidding the concession has commenced.

3/ See special recommendation in paragraph 3.42.

1. Maintenance

- 3.37 Since the concession will not be put out to tender until 1996, to ensure adequate maintenance of the highway the borrower, through the executing agency, must undertake to properly maintain the entire length of the highway between São Paulo and Florianópolis, along with its immediate accesses and equipment, to acceptable technical standards, and must present annually to the Bank, prior to August 31 each year for 10 years from the effective date of the loan contract, maintenance reports providing, *inter alia*, an evaluation of the maintenance performed during the previous year and a maintenance plan for the following fiscal year, including a budget estimate.

2. Load monitoring

- 3.38 As stated previously, the project includes the construction and/or completion of two stations for weight enforcement on the São Paulo section of the highway. Weigh stations will also be built and/or upgraded on the section located in Paraná and Santa Catarina. The concession holders will activate these stations upon completion of project construction. There will then be eight modern weigh stations. This number, and the type and location of the stations, are deemed to be adequate.
- 3.39 However, since the concession has not yet been awarded, and bearing in mind the history of inactivity of existing weigh stations on federal highways, it is recommended that the borrower be required to demonstrate to the Bank, within the fourth year from the effective date of the loan contract, that the load-monitoring system for vehicles traveling the highway is in operation. Furthermore, the borrower must submit annually to the Bank, for a period of 10 years from the effective date of the loan contract, a report outlining the results of the previous year, including statistics on the number of freight vehicles that were weighed at each station, the number and size of excess loads verified and the fines levied on offenders.

3. Tolls

- 3.40 One element of the proposed project is construction by the private concession holder of eight stations for collecting tolls from vehicles traveling on the highway. Five of these stations will be located between São Paulo and Curitiba and the other three between Curitiba and Florianópolis. They are adequate in terms of number and location: the collection will take place at strategic points to capture the largest number of vehicles, outside the metropolitan areas with internal traffic. The form of collection, fee to be charged and implementation of the system will be studied and presented in a specific plan as described below.

- 3.41 It is recommended that the borrower be required to present to the Bank, within the second year from the effective date of the loan contract, a detailed plan for the operation of these tollbooths and the exact amount to be charged, calculated to cover at least the costs of the concession holder (for maintenance, operation and administration) and return on invested capital, and to recoup at least the full servicing of the debt raised to finance the project. The toll is to be collected from the time of completion of the project works. The borrower must submit annually to the Bank, for a period of 10 years from the effective date of the loan contract, satisfactory evidence that tolls are effectively being collected on this highway, indicating in the annual reports the revenues raised thereby.
- 3.42 Should the bidding of the concession be unsuccessful, the government will undertake to carry out the planned works and will provide the services of operation and maintenance of the highway until it is possible to re-bid those services (and unfinished works, if any). In such case, the toll charge must be calculated to cover at least the equivalent of the items listed in paragraph 3.41.

K. Audits

- 3.43 The financial statements of the executing agency and of the project will be audited by the Federal Comptroller's Office, in accordance with the criteria established by the Bank for these purposes.

L. Ex post evaluation

- 3.44 The borrower has expressed its wish to conduct an ex post evaluation of the project. The terms of reference and instructions for performing the evaluation are to be presented to the Bank within one year of signature of the loan contract, and the findings of the evaluation will be presented to the Bank within two years of the date of the final disbursement. The DNER will have the necessary information on vehicle flows and levels of service of the highway to perform this task at no additional cost. It is recommended that the same data on economic costs and the methodology of the original feasibility studies contained in the volumes produced under the IME-DNER agreement of August 1995 be used; they are in the project's technical files.
- 3.45 There are two key issues for the ex post evaluation of the project: the quality of service offered to users, and the financial success of operation of the highway for the concession holder and for the government. The concession bid documents will specify the data to be provided by prospective concessionaires on the flow and mix of traffic. It will also include specifications on: (a) the maximum waiting time at tollbooths, ensuring free passage of vehicles when this is exceeded, and (b) specification of the maximum time for arrival of emergency breakdown or medical assistance services. These requirements and monitoring by local DNER offices will ensure

a constant flow of information and permanent oversight of the levels of service afforded by the concession holder to users.

- 3.46 The same information will allow ongoing control of the concession holder's reports on its revenue and the amounts transferred to the government. The DNER, together with the National Treasury, must keep a permanent record of receipts in nominal and real values and of the payments made, with the respective dates, and present a summary of these data to the Bank annually.

IV. THE BORROWER AND THE EXECUTING AGENCY

A. Institutional analysis

1. Borrower and executing agency

- 4.1 The borrower will be the Federative Republic of Brazil, and the executing agency the National Highway Department (DNER).

a. Nature and functions

- 4.2 The DNER is an autonomous agency linked to the Ministry of Transport, responsible for planning, coordinating and controlling the federal highway system, and for administering and enforcing the policies that regulate it. It was established by Decree-Law 8,463 of December 27, 1945 and subsequently complemented with Decree 61 of March 15, 1991 which incorporated the agency's internal regulations.
- 4.3 As executing agency of the project, the DNER will have the following functions: (i) supervision, approval of documents (such as bid documents and terms of reference for contracting consultants) and general technical oversight, including inspection visits; (ii) financial control of requests for disbursements of the Bank's financing, release of counterpart resources, accounting and financial records of all transactions and presentation of annual accounts for inspection by the Federal Comptroller's Office, which will be responsible for auditing the project, and presentation to the Bank of all project documentation required in the loan contract. Chapter III described the execution procedure that will operate among the three federal highway districts of the DNER that are to participate in project execution with the UGP, which will be responsible for institutional coordination of the project.

b. Organizational structure

- 4.4 The present structure of the DNER shows the following levels:

- a. Decision-making body: Board of Directors
- b. Units directly assisting the general directorate: Office of the Director General and Technical Advisory Unit
- c. Departments: General Counsel's Office, Internal Auditing, and Administration and Finance Department
- d. Technical units: Highway Engineering Department, Highway Operations Department and Technological Development Department
- e. Regional units: Federal Highway Districts

- 4.5 The reorganization process launched by the DNER in 1989 is geared toward administrative decentralization and transferring part of the federal highway system to the states, and will be confirmed through

changes in the Sistema Nacional de Viação (SNV) ^{4/} through a law to be approved by the National Congress. The DNER also plans to transfer the operation and maintenance of some multilane federal highways to the private sector under concession, including the highway to be financed by this operation.

- 4.6 Throughout this entire process the organizational structure of the DNER will need to be modified to render it compatible with its functions of planning (that will be decentralized to the federal highway districts), and execution and control of operations. This process is expected to culminate in a revamped institutional model for the agency based on the new strategies and policies defined for the highway sector in the review and approval of the SNV.
- 4.7 Though the role ultimately defined for the DNER will give rise to a new institutional configuration, it should be noted that the existing organizational structure is appropriate for fulfilling its functions and those it will be responsible for under the arrangements for execution of this project.

c. Human resources

- 4.8 The process of reorganization of the DNER outlined above led to major changes in the structure of its staff. There were staff changes in all areas, and a significant reduction in total numbers. The ensuing difficulties and delays in day-to-day operations of the agency hampered the execution and oversight of the projects for which it was responsible, but these were subsequently resolved.
- 4.9 Current DNER salary scales are not competitive with market salaries (despite improvements seen with the approval of Law 8,852 of February 4, 1994 analyzed below) and within the agency there are location-based discrepancies, there being no uniform salary scale for employees that perform similar tasks in different states. A further factor that considerably affected the DNER's staff was the transfer of the agency's headquarters from Rio de Janeiro to Brasilia at the beginning of the 1990s, without offering the staff any incentives to relocate. This resulted in early retirement from the institution of a large percentage of its best-qualified personnel. Moreover, responsibilities and authority must be defined by updating job descriptions. To improve this situation, the DNER is conducting the second phase of a process of reorganization and modernization that will be submitted for approval by the authorities in the next few months, including the specialization of its professional staff. The DNER is also carrying through a program financed by the World Bank, in which one of the components is geared to human resource training and includes a program to train maintenance managers and engineers consistent with the aforementioned modernization initiatives.

^{4/} The National Transport System.

Execution of this component is scheduled for completion at the end of 1995.

- 4.10 The evolution of the structure of the DNER's staff, as of July 31 of each year, is as follows:

Table IV-1
CHANGES IN DNER STAFF

YEAR	HIGHER LEVEL	MID-LEVEL	TOTAL
1990	1,378	14,457	15,835
1991	1,077	6,428	7,505
1992	1,053	7,298	8,351
1993	995	6,536	7,531
1994	927	5,638	6,565
1995	960	5,405	6,365

Source: DNER Administration and Finance Department

- 4.11 The DNER's total complement of staff as of July 31, 1995, presented in the previous table, is down considerably (60%) from the level in 1990. The greatest impact is seen in mid-level personnel (63% drop); higher-level staff numbers also fell by 40%. This reduction is consistent with the DNER's strategy to downsize the state apparatus, decentralize and contract services to the private sector. Nevertheless, its scale will be defined in the second phase of reorganization to be submitted by the DNER to the authorities in the coming months.

d. Financial administration and control system

- 4.12 The Finance Division of the DNER's Administration and Finance Department is responsible for administration of financial resources and for budget execution and control. Each department and federal highway district manages its budget, committing resources according to schedules approved for the different programs. Financial management comes under the Integrated System of Financial Administration (SIAF) administered by the Secretariat of the National Treasury (STN) under a "consolidated account" system. Under this system, each public agency functions as a "depository", with payments made through accounts controlled by that department. All of these activities are being adequately performed and controlled.
- 4.13 There is an internal and external control system for DNER transactions. Federal audit activities comprise: (i) internal auditing

of the DNER; (ii) internal auditing of the Ministry of Transport; (iii) external auditing by the Federal Comptroller's Office (SFC); and (iv) the nation's official auditing office. Each of these units acts within its respective jurisdiction and level; their work is deemed acceptable.

- 4.14 As the SFC is responsible for external auditing of the projects and programs financed by multilateral lending agencies, it is recommended that the project's financial statements be presented annually, duly audited by that Office, during the period of execution.

e. Historical financial analysis 5/

- 4.15 The official budgets approved by the government and executed by the DNER during the period 1991-1994 were analyzed, with an emphasis on budget outturns. Since Brazil suffered from severe hyperinflation during those years, the budget performance figures were converted to current U.S. dollars, using the average exchange rate of each year published by the Central Bank of Brazil. The condensed budgetary outturns for the period analyzed are shown in the following table:

Table IV-2
DNER: Consolidated Budget Performance 1991-1994
(in millions of U.S. dollars)

	1991	1992	1993	1994	Total	%
REVENUE						
Total current revenue	393.3	327.3	6.6	21.5	748.7	16.5
Total capital revenue	836.0	785.8	48.1	0.1	1,670.0	36.8
Transfers	0	17.6	1,033.6	1,065.6	2,116.8	46.7
Grand total	1,229.3	1,130.7	1,088.3	1,087.2	4,535.5	100
EXPENDITURES						
Current expenses	372.7	344.9	383.7	506.4	1,607.7	35.4
Capital costs	716.6	681.6	704.3	501.3	2,603.8	57.4
Spec. and ext. credits	89.7	0	0.3	79.5	169.2	3.8
Subtotal	1,179.0	1,026.5	1,088.3	1,087.2	4,381.0	96.6
Total surplus	50.3	104.2	0	0	154.5	3.4
Total expenditures	1,229.3	1,130.7	1,088.3	1,087.2	4,535.5	100

5/ The following criterion has been used for this analysis: monetary values in current local currency were converted to current U.S. dollars using annual average currency rates provided by the Central Bank of Brazil as follows: 1991 \$409.251 = US\$1.00; 1992 \$4551.297 = US\$1.00; 1993 \$90.225 = US\$1.00; and 1994 \$0.645 = US\$1.00.

f. Revenue

- 4.16 The table above shows that during the period analyzed, the DNER had average annual revenues of approximately US\$1,110 million. Ninety-three per cent of this amount corresponded to transfers from the federal government through the Ministry of Transport, making this the principal source of DNER funds; 3.4% came from disbursements of financing obtained, and the balance was other revenue, including the provision of services such as rentals and sales of property and others.
- 4.17 In 1991 and 1992, current revenue represented approximately 30% of total revenue, and capital revenue 69%. In the two following years, the Ministry of Transport changed the name of the "Current Transfers" and "Capital Transfers" accounts to "Transfers", consolidating the two items in one; hence, no separate analysis of the two is possible. However, the amount of funds for 1993 and 1994 corresponding to "Transfers" is similar to that of the two preceding years.
- 4.18 Borrowings accounted for 3.5% of receipts in the period analyzed; within the ceilings established by the Secretariat of the National Treasury, these funds helped keep DNER finances in balance and allowed a sustainable scheme for financing public works.
- 4.19 With respect to financing of DNER operations during the period analyzed, the principal sources of funds are transfers from the federal government to the DNER through the Ministry of Transport and borrowings, largely external.

g. Expenditures

- 4.20 Of total DNER expenditures, 45.8% were for highway construction and restoration works and 47.1% for administration. Of the latter item, US\$758.7 million (36.8%) went to pay for debt servicing and 47.3% for personnel. The breakdown of the DNER's expenditure will change significantly as a result of the changing role this agency is to play, particularly after approval of the SNV, which includes, among other things, transferring most of the federal highway system to the states, and the operation and maintenance of some federal highways to the private sector under concession, including the highway to be financed by this operation. This would imply a reduction in the DNER's costs in the long term. However, to achieve that reduction, the DNER must restore the roads it plans to transfer to the states and private sector, which would mean, in principle, heavier outlays for highway infrastructure.
- 4.21 Current expenditures that in the first three years averaged approximately US\$370 million rose to US\$506 million in 1994. The greatest impact of this increase was seen in salaries and benefits, with US\$117 million, despite a reduction of nearly 1,000 employees compared with 1993. The increase was due to the approval of

Law 8,852 of February 4, 1994 that brought the salaries of all civil servants into line with those of the judicial and legislative system, and because in 1994 the DNER had to start paying the pension fund contribution for its employees that was previously paid by the STN.

- 4.22 Capital expenditures in the first three years shown averaged approximately US\$700 million, and fell to US\$501.3 million in 1994. This drop is explained largely by the impact of Presidential Decree 1,358 of December 30, 1994 that set ceilings on the financial expenses of government agencies, which forced the DNER to cancel commitments contracted under this item to be paid at year-end, for an approximate amount of US\$182 million.

h. Comparison of revenue and expenditures

- 4.23 In general terms, comparison of the DNER's revenue and expenditures during the period analyzed shows a balanced financial position. The DNER's debt service payments are up to date. As a restraint measure and to rationalize public spending, the STN has instituted the practice of limiting financial costs of government offices to the strict essentials. Accordingly, the Ministry of Transport has been applying that approach in its agencies, including the DNER, which largely explains its financial equilibrium. This measure was reinforced by Presidential Decree 1,358 of December 30, 1994, which ratified the STN's decision and established specific ceilings for each state agency.
- 4.24 To conclude this budgetary analysis of the DNER over the past years, it should be noted that the results recorded reflect prudent financial administration, concerned with maintaining fiscal balance by committing expenditures only when the necessary resources are available to back them up.
- 4.25 A study has been included in the proposed operation to examine what it would cost to improve highway systems at the federal and state levels, and the problem of financing those systems.

V. PROGRAM FEASIBILITY

A. Technical feasibility

- 5.1 The project for expansion and improvement of the São Paulo-Florianópolis highway (BR-116, BR-376 and BR-101) conforms to the basic guidelines of the Brazilian government's highway subsector policy, which is to recondition and maintain the existing highway system, thus improving levels of user safety and reducing vehicle operating costs. Furthermore, involving as it does the concession to private enterprise of the operation of the highway, along with construction of installations required for implementing a user toll, the project is consistent with another policy guideline, that of establishing a system of permanent financing for the restoration and maintenance of federal highways.
- 5.2 With one exception, the final engineering designs of the project works are completed, and include appropriate technical solutions consistent with sound engineering practice. The only section for which the basic design and bidding documents are pending (30 km in Serra do Cafezal) already has preliminary designs, which are to be completed in the course of the project. All these facts were taken into account in the evaluation of construction costs, which proved reasonable, including provisions for contingent costs and escalation of construction prices.
- 5.3 The project works are expected to be satisfactorily maintained under contracts awarded to private companies in accordance with DNER policies.

B. Institutional feasibility

- 5.4 The project will be executed within the organizational structure of the DNER, which has vast experience in projects of this type. Nevertheless, to guarantee the planning, coordination and control of all activities that must be conducted by the different DNER units participating in the project, the DNER set up a Project Management Unit (UGP), pursuant to Directive 1,148 of October 23, 1995. The UGP will have the human, administrative, accounting, technical and data-processing resources needed to perform its functions, and will receive support from a specialized consulting firm for project administration. Based on these facts and the measures adopted by the DNER for this operation, the proposed institutional structure is deemed to adequately meet the Bank's requirements for execution of this project.

C. Financial feasibility

- 5.5 The financing scheme of the operation limits the National Treasury's participation to only US\$300 million, to be disbursed

over four years. This figure is reached after deducting from the total cost the funding to be supplied by the IDB, EXIMBANK of Japan and the private sector, and is quite marginal for Brazil's normal level of investments in transportation.

- 5.6 Under a more pessimistic scenario in which the participation of EXIMBANK of Japan and of the private sector failed, for any reason, to materialize, the Brazilian government would be obliged to cover US\$833 million of counterpart funding, also to be disbursed over the four-year period from 1996 to 1999. To assess the fiscal impact of a contribution of this size, Annex V-1 shows the government's multiyear plan for the said period. It indicates that:

- (i) the amount allocated to infrastructure would be US\$85.7 billion, and to transportation US\$13.4 billion; and
- (ii) the above amount of US\$833 million would represent 6.2% of the transportation budget. This figure seems to be manageable, inasmuch as the operation under analysis is considered to be the most important transportation project and has been given the highest priority by the national authorities.

- 5.7 Finally, federal government forecasts 6/ provide for budget financing as follows:

SOURCE	AMOUNT (US\$ billion)	%
Taxes and contributions <u>7/</u>	318.4	69
Sources of financing <u>8/</u>	90.0	20
Other sources <u>9/</u>	50.6	11
TOTAL	459.0	100

- 5.8 It can be deduced from the preceding table that the US\$833 million of counterpart funding required under the "worst" scenario would be a mere 0.2% of internally generated budget funds for the four-year period. Again, since Brazil deems this works project to be a

6/ According to the Multiyear Plan, 1996-1999.

7/ Includes social security.

8/ External, private, and state and municipal.

9/ Self-financing of state enterprises, internal financing, etc.

priority, there should be no problems in provision of the local counterpart funding.

D. Economic feasibility

1. Economic return

- 5.9 According to Bank criteria, the economic internal rate of return (EIRR) and net present value (NPV) are calculated from the costs and benefits that are quantifiable in monetary terms, both expressed in economic prices. These costs relate to: (i) constructing an additional roadway to double sections now having a single roadway; (ii) repair of existing roads along stretches that are in poor condition; (iii) new accesses and tollbooths, services and weigh scales; (iv) operation of the toll system and emergency breakdown and medical assistance; and (v) highway maintenance. The capital costs of the additional roadway and repair works include steps to prevent erosion, and other environmental measures.
- 5.10 The benefits include: (i) reduction of vehicle operating costs by raising the levels of service of the highway and improving the surface; (ii) the value of time saved by passengers in buses and cars and by freight transported; and (iii) the value of reduction in accidents.
- 5.11 The annual traffic growth rates used are 2.3% for the section between São Paulo and Curitiba and 3.2% between Curitiba and Florianópolis. These rates were estimated on the basis of an analysis of past determinants of traffic on these and other highways. That analysis included a simulation which demonstrated a 90% probability that the said rates would be exceeded and a 70% probability that the rates of 4.2% and 5.4% would be surpassed on the respective sections.
- 5.12 Two models were used to evaluate the project's economic return:
- (i) HDM-III, a model designed to represent conditions of typical light rural traffic under free-flow conditions, and not for congestion that requires multilane highway construction. That model underestimates benefits because it contains no system of equations to represent the effect of stop-and-go cycles on operating costs. Only the costs corresponding to traffic standstills were calculated outside the model, i.e., a small part of the costs included in the unstable F level of service.
 - (ii) A model that calculates operating costs as a function of speed and its variation along typical sections of the highway, based on the performance curves of vehicles supplied by the manufacturers.

- 5.13 The indicators of economic return are shown in Table V-2. Both models indicate that the project is economically sound. According to HDM-III the EIRRs are 15% for the section between São Paulo and Curitiba, 39% between Curitiba and Florianópolis, and 71% for the eastern bypass around Curitiba.
- 5.14 As the method underestimates the benefits of a multilane highway and a traffic growth rate that has a 90% probability of being exceeded, the sensitivity analysis simulated a 25% increase in costs, and confirmed that the EIRR for the section with the lowest rate (São Paulo-Curitiba) would still be sound (14%) and the other sections would still have very high rates.

Table V-2
Rate-of-return indicators

COMPONENT	EIRR (%)	NPV (US\$ MILLION) AT 12% INTEREST P.A.
HDM-III model		
São Paulo-Curitiba	16.7	174.451
Curitiba-Florianópolis	38.6	792.545
Eastern bypass, Curitiba	70.9	234.000
Sensitivity analysis: costs + 25%		
São Paulo-Curitiba	13.9	84.073
Curitiba-Florianópolis	32.3	730.934
Eastern bypass, Curitiba	59.6	227.000
Model with effect of reduction in congestion		
São Paulo-Curitiba	89	3,858
Curitiba-Florianópolis	123	5,140
São Paulo-Florianópolis *	104	9,039

* Includes the eastern part of the Curitiba bypass.

- 5.15 The alternative model, which incorporates the benefits of reducing congestion by turning single roadways into divided highways, presents far higher values for the economic feasibility indicators. The net present value (NPV) at 12% annual interest amounts to US\$9 billion, about seven times higher than the sum of the NPVs with the first model.
- 5.16 Monetary quantification of the reduction in cost of accidents was included in the HDM-III model. Those values are calculated on the basis of estimates of the direct costs of accidents (damage and loss of vehicles and freight, medical and hospital expenses) and of

the reduction in cost, in present value, of future wages foregone as a result of accidents. The average cost of accidents was estimated at US\$21,510, ranging from US\$11,849 for an accident with no victims to US\$118,211 for an accident causing deaths.

- 5.17 Using these values, a discounted present benefit of US\$250 million was estimated as a function of the decrease in accidents.

E. Feasibility of the concession

- 5.18 The private concession will include dealing with accidents, operation and maintenance of the highway, preceded by private investment to construct tollbooths and install equipment, vehicle weigh stations (scales), as well as accesses, intelligent traffic signs, lighting and emergency telephones. The state will grant the highway under concession to the successful tenderer in a call for bids, to be awarded on the basis of the lowest toll fee required, including a fixed portion to be transferred to the government. For operational and anti-monopolistic reasons, the concession will be divided into two sections: (i) BR-116 (São Paulo-Curitiba), and (ii) BR-376 and BR-101 (Curitiba-Florianópolis). The feasibility analysis conducted refers to the advantages to the private sector of participating under the assumptions adopted in the economic analysis as most likely to occur.
- 5.19 The basic toll rate adopted, therefore, was US\$2.50 per vehicle per tollbooth in each direction for both stretches, the first of which will have five toll stations and the second three. Private investments were estimated at US\$54.6 million for the first stretch and US\$44.5 million for the second. Current taxes on gross receipts (ISS 3%; PIS 0.65% and CONFINS 2%) and on income (with graduated rates from 25% to 40%) were taken into account. In terms of costs, estimates were included of the direct costs of toll collection, of dealing with accidents, of additional interventions on the highway, of routine and periodic maintenance and of bridge repair, in addition to coverage of IDB debt service.
- 5.20 The rates of return of private capital are different for each section, as expected based on the findings of the economic analysis. The details were as follows:

INTERNAL RATE OF RETURN		
PROBABILITY	BR-116	BR-101
95%	16.4%	21.5%
90%	17.2%	22.2%
80%	18.1%	23.0%
70%	18.7%	23.7%
50%	19.9%	24.8%

- 5.21 Despite the differences between the two series, each one seems to confirm the advantages of private sector participation in the operation under the terms assumed. The rates of return indicate a high probability (80%) of obtaining returns above 18% or 23% in constant currency, depending on the section in question. These values indicate that the hypotheses used are reasonable and that the state will find private counterparts interested in operating the highway, on terms acceptable to its potential users.

F. Environmental feasibility

- 5.22 Once the impacts of the project were known and characterized, corrective actions evaluated, and an environmental management strategy designed, a comprehensive environmental assessment was conducted, considering that all environmental measures recommended in the environmental impact assessment (EIA) would be executed. The results of that evaluation indicate that the project is environmentally feasible: its environmental effects are small in extent and significance, and are for the most part temporary and reversible. Mitigation and offsetting measures are to be adopted to minimize those effects that are long-term and irreversible.
- 5.23 The EIA of the program has been used as a basis for preparing the information required under federal environmental law and that of the three states involved, which in turn is consistent with Bank requirements. All the environmental information relating to this project has been made available for public review.

G. Risks

- 5.24 The specific risks of the physical aspects of project execution are associated with costs and timetables for execution. Its environmental, technical and financial feasibility has been confirmed in the previous paragraphs of this chapter. Accordingly, the greatest risks relate to eventual delays in the processes of bidding, awarding and carrying out the works. Possible risks in this connection, and preventive measures, are as follows:

- a. Protests by unsuccessful bidders. This risk will be minimized by the prequalification of firms, so that the bidding is decided on the sole basis of the lowest evaluated bid that substantially complies with the bidding documents for each lot. Nevertheless, groundless protests may occur and cause substantial delays.
- b. Protests by firms that are working on certain sections of the highway in São Paulo, on previously contracted works that have not been fully completed. That risk has been minimized through notification of partial termination of the agreement with São Paulo, and the provision that the DNER transfer, by December 31, 1995, funds to that state to pay for completed works.
- c. The possibility that the successful bidder will propose a price that subsequently proves to be unfeasible and work therefore comes to a standstill, as occurred in the first stage of dividing the Fernão Dias highway. That risk will be reduced by requiring the firm to present a bank guarantee equivalent to 30% of the total proposed cost of its work, the same procedure that was used when the works for Fernão Dias were re-bid and which resulted in prices very close to the cost estimates.
- d. Delays in bidding the concession. This has been the experience of previous bids for operation and maintenance of the Rio-Niterói bridge and the Dutra highway, among others. Part of the problem were protests of the type described above in point a., and the measures outlined there will be used to guard against this eventuality. In addition, the protests were enabled by the lack of specific pertinent legislation in accordance with the provisions of the 1988 Constitution, which forced the DNER to rely on previous legislation and legal interpretations that arose in the course of preparation of the bidding process itself. This problem was eased by the enactment in February 1995 of the Concessions Law. The project is scheduling the process of awarding the concession for 1996, to ensure a period to resolve any protests that might arise in good time for the concession holder to install the tollbooths and other works for which it is responsible at the same time as the final phase of the work to build an additional roadway for the highway.
- e. Commercial risks for the highway concessionaire. This risk is being attenuated by providing that transfers of the share of receipts to the state will be lower if traffic volumes are lighter than forecast. Likewise, the requirement that bidders post performance bonds should reduce the likelihood of unduly optimistic proposals.

LOGICAL FRAMEWORK

IMPROVEMENT OF THE SÃO PAULO-FLORIANÓPOLIS HIGHWAY (BR-0150)

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
GOAL To help reduce transport costs between the states of Paraná, Santa Catarina and São Paulo and between them and Rio Grande do Sul and bordering countries.	1. By 12/99 the average vehicle operating costs between São Paulo and Florianópolis will have been reduced by 25% compared with the "without project" scenario by the same date.	1. New run of model II of the viability study of the IME/DNER agreement, based on traffic counts by the concession holder for 12/99.	1. Between 2000 and 2010, per capita income in Brazil does not fall. 2. In the same period there is no deterioration of income distribution in Brazil. 3. No significant setbacks in the institutional agreements of MERCOSUR.
PURPOSE To raise the level of service of the São Paulo-Florianópolis highway and reduce accident rates on that road.	1. By 12/99 compared with 12/94, the quality of service on the highway will have been raised from levels D, E and F to A, B and C during peak hours and at the following vehicle counting posts: (i) posts 2, 3 and 4 of BR-116; (ii) post 10 of BR-376; and (iii) posts 12, 14 and 16 of BR-101. 2. By 1999 compared with 1994, accidents on the highway will have dropped 30%, per million vehicles per km-year, in the categories of accidents with deaths and with injuries that in 1994 were 385 and 1,871 respectively. As of 1999, these rates should not rise.	1. For 12/94, pp. 46-66 of book II, vol. 2 of the basic project studies, DNER/IME agreement; for 12/99, survey at same posts, using compatible methods, to be conducted by the concession holder and compared with the situation forecast in 1999 in the same book II, vol. 2. Service levels are those defined in the 1994 Highway Capacity Manual. 2. For 1994, book I, vol. 2, p. 104 and annex to same, p. 63; for 1999 and subsequent years, data of Federal Highway Police.	1. The rest of the highway system in the service area of the highway will be maintained (south and southeastern regions of FIBGE). 2. The principal highways connecting the capitals of neighboring countries to their borders with Brazil will have been constructed or improved.
COMPONENTS 1. Existing roadway restored and additional roadway (for a divided highway) constructed between São Paulo and Florianópolis.	1.1 By 1/99, the following sections will be divided highway: (a) BR-116 from km 298.4 in SP to km 568.8 (SP/PR border); (b) BR-116/PR from km 0 to km 72.8; (c) eastern part of Curitiba bypass; (d) BR-376 from km 635.6 to 704.8; and (e) BR-101/SC from km 0 to 216.5.	1.1 The terms of acceptance of the respective works by DNER.	1. The rates scheme remains politically acceptable and without legal restrictions that compromise its implementation.

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
	1.2 By 1/99, the following sections of existing roads will have been restored: (a) BR-116/PR from km 298.9 to 568.8 (SP/PR border); (b) BR-116/PR from km 0 (SP/PR border) to km 72.8; (c) eastern bypass of Curitiba; (d) BR-376/PR from km 635.6 to 704.8; and (e) BR-101/SC from km 0 (PR/SC border) to km 216.5.	1.2 Idem.	
2. Toll stations set up	2. By 1/99, the eight toll stations specified on p. 8, vol. 3 of the document "Project of expansion of highway capacity between São Paulo, Curitiba and Florianópolis" of 8/95 will have been set up.	2. Idem.	2. The concession holder operates the highway according to bid specifications.
3. Truck weigh stations set up	3. By 1/99, the four stationary weigh scales and six platforms to operate four mobile scales will have been set up according to specifications in the same vol., pp. 11-12.	3. Idem.	3. No legal problems to prevent operation of the truck weigh stations or the collaboration of highway police.
4. Equipment for emergency breakdown and medical assistance acquired and ready for operation, either owned by the concession holder or available through agreement or rental.	4. By 1/99, the respective equipment and human resources will be in place to operate the system, as specified in pp. 11-15 of vol. 3 of said document.	4. Idem.	
5. Operational phase of highway implemented through concession, involving toll collection and provision of maintenance, breakdown, medical assistance and other services.	5. By 1/99, the concession holder will have initiated operation of highway with all equipment and human resources specified in the bid documents.	5.1 Terms of concession of use of DNER property to the concession holder. 5.2 Terms of transfer of highway operation from DNER to concession holder.	
6. Institutional strengthening of the highway subsector and associated agencies.	6.1 By 12/96, studies concluded on financing and administration models of Brazilian federal and state highways. 6.2 Every six months from the first half of 1996, 10 transportation courses will be run, pursuant to item 5.2 of vol. 6, book I, of the basic project document of August 1995.	6.1 Final report delivered by 6/96. 6.2 Semiannual IME report.	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
	<p>6.3 By 12/97, prefeasibility study of alternatives for construction of a highway between Curitiba and borders with AR and UR concluded, together with engineering design for first section of alternative selected (from Florianópolis to Osorio or from Curitiba to interior RS, for equivalent distance).</p> <p>6.4 By 12/96, study of DNER functions, procedures and resources completed.</p>	<p>6.3 Final report on the study.</p> <p>6.4 Final report on the study.</p>	
ACTIVITIES			
1.1 Implementation of UGP (see project execution schedule.)	1. See detailed project budget.	1.1 Accounting records to be prepared by UEP, containing all charges derived from project execution according to chart of accounts duly prepared by executing agency and approved by the Bank.	1. No legal action that significantly delays awarding of works.
1.2 Preparation of engineering design for Serra do Cafezal.	1.2 Idem.	1.2 Project concluded and accepted by DNER and IDB.	2. Timely provision of local counterpart and/or cofinancing.
1.3 Bidding and award of advisory services for UGP.	1.3 Idem.	1.3 Award document.	
1.4 Bidding and award of works supervision.	1.4 Idem.	1.4 Idem.	
1.5 Bidding and award of following construction lots:	1.5 Idem.	1.5 Idem.	
(i) 01/SC to 05/SC; 07/SC to 14/SC; 16/SC to 17/SC; and 03/SP;			
(ii) 01/PR to 09/PR; 06/SC to 15/SC; and 10/SP-OAE* to 17/SP-OAE;			
(iii) 01/SP to 02/SP; and 04/SP to 09/SP; and			
(iv) 18/SP to 19/SP.			
2. Bidding and award of concession service for highway operation.	2. Idem.	2. Idem.	
3. Idem.	3. Idem.	3. Idem.	
4. Idem.	4. Idem.	4. Idem.	
5. Idem.	5. Idem.	5. Idem.	
6. Studies with respective terms of reference tendered and awarded.	6. Idem.	6. Idem.	

* Special concrete structures.

WORKS TO BE FINANCED AND WORKS SLATED FOR PRIVATE FUNDING

- A. Components to be financed by the IDB and cofinanced by international agencies:

ROUTE	LOTS	LOCATION	LENGTH (km)	COSTS (US\$ million)*
BR-116/BR-376	01-09	PARANÁ	185.8	157.6
BR-101	01-17	SANTA CATARINA	212.8	277.8
		SUBTOTAL, SOUTH	398.6	435.4
BR-116	01-23	SÃO PAULO	260.9	383.3
TOTAL			659.5	818.7

* Direct costs at December 1994 prices for costs from 1996, excluding the part to be executed by private initiative.

- B. Components that can be executed using private and government funds:

WORK	SÃO PAULO R\$ million	PARANÁ R\$ million	S. CATARINA R\$ million	TOTAL R\$ million	TOTAL US\$ million
Traffic signs, guardrails, etc.	8.2	13.5	8.3	30.0	35.3
Bridge widening	4.5	5.5	6.8	16.8	19.8
Lighting			13.2	13.2	15.5
Toll facilities	10.0	5.0	5.0	20.0	23.5
Scales	2.0	1.1	1.0	4.1	4.8
SUBTOTAL PRIVATE (R\$ million)	24.7	25.1	34.3	84.1	98.9
Government (1995)			15.6	15.6	18.4
TOTAL (R\$ million)	24.7	25.1	49.9	99.7	117.3
TOTAL (US\$ million)	29.1	29.5	58.7	117.3	

* Direct costs at December 1994 prices.

TENTATIVE TENDERING PLAN

A. Plan of international public calls for tender for works financed(*)

SECTION	LENGTH (km)	DIRECT COST US\$000 **	DATE OF NOTICE
Lots 1-5 (S. Catarina)	132.1	129,620	
Lots 7-14 (S. Catarina)	51.9	90,000	
Lots 16 and 17 (S. Catarina)	OAE ***	6,890	
Total Group I	184.0	226,510	Nov 1995
Lots 1-9 (Paraná)	185.8	157,580	
Lots 6 and 15 (S. Catarina)	28.8	51,320	
Total Group II	214.6	208,900	Dec 1995
Lots 1-9 (São Paulo)	187.2	133,910	
Lots 10-17 (São Paulo)	OAE	8,780	
Total Group III	187.2	142,690	1st qtr 1996
Group IV - Lots 20-23 (São Paulo)	43.7	87,690	2nd qtr 1996
Group V - Lots 18 and 19 (São Paulo)	30.0	152,940	4th qtr 1996
GRAND TOTAL	659.5	818,730	

* There will be prequalification in all these bids for works to be financed by the IDB and the cofinancing agency.

** Direct costs are indicated at December 1994 prices and are a preliminary estimate. They do not include the private-sector share.

*** Special concrete structures.

B. Tendering plan for consulting and engineering firms

	Form of tendering	Prequal. (yes or no)	Dates of notices	Value R\$000 Dec. 1994	Value US\$000 Dec. 1994
1. ENGINEERING				38,660	45,470
1.1 Engineering design and bid docum. Serra do Cafezal	LCO	Yes	4th qtr 1995	750	880
1.2 Supervision				30,610	36,000
1.2.1 Hwy. division/rest./exprop. - Paraná BR-116, BR-376 and Curitiba bypass	LCO	Yes	4th qtr 1995 (*)	7,000	8,230
1.2.2 Hwy. division/restoration S. Catarina BR-101	LCO	Yes	Already contracted	10,800	12,700
1.2.3 Hwy. division/restoration São Paulo BR-116	ICO	Yes	1st qtr 1996	9,420	11,090
1.2.4 Hwy. division/restoration São Paulo Serra do Cafezal	ICO	Yes	4th qtr 1996	3,390	3,980
1.3 UGP admin.; management support	LCO	Yes	4th qtr 1995	7,300	8,590
2. MITIGATING ENVIRONMENTAL MEASURES				3,820	4,490
2.1 Erosion control	LCO	Yes	2nd qtr 1996	840	990
2.2 Recovery of degraded areas	LCO	Yes	2nd qtr 1996	840	990
2.3 Monitoring	LCO	Yes	2nd qtr 1996	300	350
2.4 Archaeological program	LCO	Yes	2nd qtr 1996	240	280
2.5 Health program	LCO	Yes	2nd qtr 1996	900	1,060
2.6 Social program	LCO	Yes	2nd qtr 1996	540	630
2.7 Program of support for indigenous communities	LCO	Yes	2nd qtr 1996	160	190
3. STUDIES				9,230	10,860
3.1 Operational plan São Paulo exit	ICO	Yes	1st qtr 1996	350	410
3.2 Prefeasibility Florianópolis/ border	(1)	N/A	N/A	300	350
3.3 Feasibility first stage Florianópolis/border	(1)	N/A	N/A	1,000	1,180
3.4 Design of first stage	LCO	Yes	1st qtr 1997	3,400	4,000
3.5 Highway financing	ICO	Yes	1st qtr 1997	255	300
3.6 Institutional revamping of DNER	ICO	Yes	2nd qtr 1996	595	700
3.7 Highway operation study	LCO	Yes	1st qtr 1996	330	390
3.8 Courses	(1)	N/A	N/A	3,000	3,530
TOTAL				51,710	60,820

ICO = International public call for offers with Bank financing. LCO = local public call for offers with counterpart financing.

(1) To be conducted under DNER/IME agreement using counterpart funds.

* Already contracted in case of Curitiba bypass.

INVESTMENT SCHEDULE

1. The consultant hired to review the project's engineering studies and its costs conducted an evaluation of the construction cost schedules and reached the following conclusions:
 - Lots of additional roadway construction and highway restoration; additional-roadway lots; lots of additional roadway construction, restoration and special concrete structures, and remaining lots of the São Paulo Highway Department: 40% of their direct costs will be committed in the first year and 60% in the second.
 - Highway restoration lots; and maintenance lots to ensure smooth traffic flow: 60% of their direct costs will be committed in the first year and 40% in the second.
 - Lots of special concrete structures, including bridge widening: 49% of their direct costs will be committed in the first year, 27% in the second and 24% in the third year, with works distributed over three years to guarantee the least possible disruption of existing traffic.
2. Bearing in mind that the project works will not start in January of the calendar year but around March each year in the case of the DNER and around July for private enterprise, these schedules were combined with the following results:
 - 39.5% of the cost in 1996, 52.5% in 1997 and 8% in 1998 for DNER works, with the works in Serra do Cafezal starting one year after the others; and
 - 25% of the cost in 1997, 50% in 1998 and 25% in 1999 for private sector works, which like the Serra do Cafezal works do not begin until 1997.
3. The following table shows the costs of each project category for each year of execution.

ANNUAL COSTS IN THOUSANDS OF U.S. DOLLARS							% SHARE
ITEM	1995	1996	1997	1998	1999	TOTAL	
ENGINEERING/ADMINISTRATION	440	19,120	20,240	6,490	1,880	48,170	3.76
Engineering		880				880	
Supervision		14,470	16,470	4,120	940	36,000	
São Paulo		5,010	6,730	2,790	540	15,070	
Paraná - Santa Catarina		9,460	9,740	1,330	400	20,930	
Administration	440	3,770	3,770	2,370	940	11,290	
DIRECT COSTS	18,350	262,990	436,330	183,020	35,310	936,000	72.98
Costs 1995	18,350					18,350	
Paraná - Santa Catarina		171,990	228,590	34,830		435,410	
São Paulo		91,000	183,010	98,730	10,580	383,320	
Private sources			24,730	49,460	24,730	98,920	
INDIRECT COSTS	100	24,610	2,780	2,770	2,570	32,830	2.56
Expropriations	100	23,430				23,530	
Environment		1,180	2,780	2,770	2,570	9,300	
Mitigation		1,180	1,180	1,170	960	4,490	
Offsetting			1,600	1,600	1,610	4,810	
STUDIES OF SOLUTIONS		3,010	6,690	1,160		10,860	0.85
São Paulo exit		60	350			410	
Florianópolis/border		350				350	
Florianópolis/Osorio		530	4,650			5,180	
Highway financing		150	150			300	
DNER revamping		350	350			700	
Highway operation		390				390	
Courses		1,180	1,190	1,160		3,530	
CONTINGENCY AND ESCALATION	370	57,040	52,010	7,910	800	118,130	9.21
Contingencies		13,890	25,000	13,250	2,370	54,510	
Escalation	370	43,150	27,010	-5,340	-1,570	63,620	
FINANCE CHARGES		12,940	30,930	44,540	48,160	136,570	10.65
Interest		7,800	27,320	42,770	46,880	124,770	
Credit fee		3,900	2,370	530	50	6,850	
Supervision and inspection		1,240	1,240	1,240	1,230	4,950	
IDB		1,130	1,120	1,130	1,120	4,500	
Cofinancing		110	120	110	110	450	
GRAND TOTAL	19,260	379,710	548,980	245,890	88,720	1,282,560	100.00
IDB		148,230	222,900	71,560	7,310	450,000	35.09
COUNTERPART	19,260	231,480	326,080	174,330	81,410	832,560	64.91
Cofinancing		149,260	223,810	70,720	6,210	450,000	35.09
Private			27,470	50,500	24,940	102,910	8.02
Government	19,260	82,220	74,800	53,110	50,260	279,650	21.80
IDB share (%)		39	41	29	8	35	
Cofin. share (%)		39	41	29	7	35	
Total of loans (%)		78	82	58	15	70	
Total of loans US\$000		297,490	446,710	142,280	13,520	900,000	

MULTIYEAR PLAN OF CAPITAL INVESTMENTS AND OPERATING COSTS

	Investments R\$ million	Operating costs R\$ million	Total R\$ million
Economic infrastructure	85,389	332	85,721
Transport	13,347	72	13,419
Energy	38,299	260	38,559
Communications	33,743	0	33,743
Water resources	6,742	920	7,662
Water resource management	60	124	184
Irrigation	3,165	703	3,868
Infrastructure	3,517	93	3,610
Agriculture	7,289	15,627	22,916
Industry and foreign trade	3,735	2,971	6,706
Tourism	1,091	333	1,424
Science and technology	9,430	4,925	14,355
Environment	1,735	774	2,509
Social advancement	29,838	270,800	300,638
Social security	12	184,767	184,799
Welfare	0	9,513	9,513
Health	4,737	40,824	45,661
Education	4,988	6,921	11,909
Sanitation	9,594	431	10,025
Housing	8,072	39	8,111
Urban development	2,277	68	2,345
Employment	158	28,137	28,295
Culture, justice, security and citizenship	1,831	2,016	3,847
State and public administration	658	1,958	2,616
National defense	5,652	4,917	10,569
Total	153,390	305,573	458,963

PROPOSED RESOLUTION

BRAZIL. LOAN /OC-BR. TO THE REPUBLICA FEDERATIVA DO BRASIL
(Modernization of Sao Paulo -Curitiba-
Florianópolis Highway Project)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Federative Republic of Brazil, as Borrower, for the purpose of granting a financing to cooperate in the execution of the Modernization of Sao Paulo -Curitiba- Florianópolis Highway Project. Such financing will be for the amount of up to four hundred and fifty million dollars of the United States of America (US\$450,000,000), or its equivalent in other currencies, except that of Brazil, which are part of the Ordinary Capital resources of the bank, and it will be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.