

HIGHWAY REHABILITATION PROGRAM IN THE STATE OF SÃO PAULO**(BR-0295)****EXECUTIVE SUMMARY**

Borrower:	Government of the State of São Paulo	
Guarantor:	Federative Republic of Brazil	
Executing agency:	Transport Department, State of São Paulo, Highway Bureau, (DER/SP)	
Amount and source:	IDB: (OC)	US\$120 million
	Borrower:	US\$120 million
	Total:	US\$240 million
Terms and conditions:	Amortization period:	20 years
	Grace period:	4.5 years
	Disbursement period:	4 years
	Interest rate:	variable
	Inspection and supervision:	1.00%
	Credit fee:	0.75%
Objectives:	Currency:	Currency pool
	<p>The aim of the program is to contribute to the economic and social development of the State of São Paulo. Its main purpose is to reduce road transport costs on the highway network operated by DER/SP, by carrying out civil works on a significant portion of highways that are currently in poor or fair condition. Complementing this, in order to facilitate access to the highway network and improve services for users, works will also be carried out in bus terminals, supplemented by training activities and the implementation of road management systems.</p>	
Description:	<p>The program consists of highway restoration and improvement, bus terminal construction and improvements, and institutional strengthening. The road works will consist of refurbishment of pavement, together with the construction or restoration of shoulders, masonry works and components of the drainage system on a total of approximately 1,000 km of highways. The program will also include works to stabilize slopes and install traffic signage, along with other actions to improve transport safety, such as physical alterations in</p>	

traffic patterns and in safety devices, improvements in roundabouts, introduction of a third lane on uphill segments, together with pedestrian walkways, bicycle lanes and other elements where a highway passes through an urban area. Works to be carried out in interurban bus terminals in the interior of the state will include small-scale interventions to facilitate traffic and the use of facilities by all (including the disabled), as well as the construction of new bus terminals in municipios that currently do not have any. DER/SP institutional strengthening activities will include a training program, and pavement management systems, traffic statistics and environmental management.

**The Bank's
country and
sector strategy:**

The proposed program is consistent with the strategy agreed upon by the Bank with the country, specifically in terms of enhancing competitiveness and market access (by reducing the "Brazil cost" as a result of lower transport costs; see paragraph 2.19 of the country paper, dated 7 July 2000) and modernization of the State (through modernization of Highway Bureau management). Indirectly, the proposed program will help to reduce poverty by stimulating economic activity, in particular outside the metropolitan area, facilitating access to markets as well as to education and health services, and conserving the environment by restoring areas degraded by previous interventions and implementing more effective environmental conservation measures in highway programs.

**Environmental
and social
review:**

The characteristics of the program works do not require an environmental and social impact study, nor do they need to go through the regular process for obtaining environmental permits. In compliance with the Bank's policy, DER/SP prepared an environmental impact assessment (EIA), based on simplified environmental assessments carried out on each sample project. The EIA and other environmental documents were disclosed to the public on 4 May 2001 (paragraph 3.12). The EIA concluded that: (i) from a social and environmental standpoint, the program will improve current conditions in the project's area of influence; (ii) the potential negative environmental impact of the works is minor and foreseeable, and can be mitigated through the measures included in the projects; (iii) the program will include appropriate management of environmental issues, with respect to the impact of the works, critical environmental liabilities, and the transport of hazardous materials; it will also provide the DER/SP with the tools needed to efficiently and permanently discharge its responsibilities in this area, by strengthening its environmental management capacity. The DER/SP has held public meetings with affected communities and other stakeholders, and will continue to do so during preparation of the projects for new highway segments to be brought into the program (paragraph 2.7). The environmental report was approved by the

Committee on Environment and Social Impact (CESI) on 15 June 2001 and forwarded to the Public Information Center (PIC) on 21 June 2001 (paragraph 3.12).

Benefits:

The main benefits expected from the proposed program are as follows: (i) lower transport costs; (ii) better access conditions in the state's municipios for passenger transport and the transport of agricultural and industrial production; (iii) greater safety in passenger and freight transport, with decreased accident risk, shorter travel times and more efficient routing; (iv) greater comfort and accessibility for users of bus terminals in the interior of the state; and (v) lower medium- and long-term maintenance and repair costs on the highways covered by the program. The project will benefit all residents of the state of São Paulo, particularly those living outside the metropolitan area. To a lesser extent, it will also benefit residents of neighboring states that directly or indirectly participate in trade in goods, inputs and services between persons and firms located in São Paulo and which use the port of Santos.

Risks:

Two risks have been identified. The first relates to the potential delay in preparing highway studies and designs, and their possible obsolescence if the works are carried out rapidly. This risk would be mitigated by drawing up two large groups of studies and high-quality designs, so that they can be put out to tender in the first and second years of program execution (front loading), through contracts with third parties covering both the works and their supervision. The second risk is the gradual loss of skilled DER/SP staff and alternatives for major institutional changes—two factors that could result in administrative discontinuity. In the short run this risk could be mitigated by working with engineers and experts from other bodies connected to the Transport Department, backed by a specific program component for strengthening the engineering area (paragraph 5.35). However, in the medium term, the institutional changes envisaged are considered manageable, since DER/SP is expected to continue to exist (paragraphs 4.13, 4.18 and 5.37).

Special contractual clauses:**Conditions precedent to disbursement:**

- (a) First disbursement: (i) program coordinating unit (UCP) to have been set up and staff appointed; (ii) agreement to have been signed between the borrower and the DER/SP (paragraphs 3.1 and 3.3).
- (b) First disbursement for civil works in bus terminals: (i) model agreement between DER/SP and participating municipios (paragraphs 3.7 and 3.28).

Signature of contracts and initiation of works:

- (c) Prior to approval of contracts for civil works, firms to have been contracted for UCP support, environmental consulting services, and technical and environmental supervision services (paragraphs 3.3, 3.4, 3.15, 3.17 and 5.28); prior to initiation of works; (i) measures for the public utilities affected to facilitate execution of the works, where applicable (paragraph 3.19); (ii) resettlement plan implemented, where relevant (paragraph 5.28); and (iii) for bus terminals, respective agreement to have been signed between DER/SP and municipios (paragraph 3.7).

Environmental issues:

- (d) Before calling for bids on the works, the respective environmental permit and authorization, or exemption therefrom, together with verification of legal rights of ownership, easements or other necessary rights (*idem* for the municipios participating in the bus terminal component); population resettlement plans where appropriate (paragraphs 3.25, 3.27, 5.27 and 5.28).
- (e) For the component for transport of hazardous materials: (a) 12 months after signature of the loan contract (paragraphs 3.28 and 5.31), agreements to be signed between DER/SP and the unit responsible in the military police; (b) 18 months after signature of the loan contract, procurement of computer equipment and field services for DER/SP environmental consulting services (paragraphs 5.30 and 5.31) and signature of the contract for the integration of information systems for managing the transport of hazardous materials; and (c) 24 months after signature of the loan contract: (i) presentation of emergency plan for State-operated highways; (ii) conclusion of services and procurement in contracts with the military police and implementation of the DER environmental management system (paragraph 5.33).
- (f) For environmental monitoring; (a) 12 months after signature of the loan contract, DER/SP environmental consulting services; (b) 18 months after signature of the loan contract, (i) contract for implementation of the environmental road information system; and (ii) contract for survey and assessment of environmental liabilities on DER/SP paved highways; and (c) 30 months after signature of the loan contract, implementation of the environmental management system (paragraphs 5.31 to 5.33).
- (g) Semiannual reports describing environmental measures, problems and solutions (paragraph 5.33).

Other:

- (h) Maintenance of program equipment and works in good condition, and annual maintenance plan (paragraph 3.35).
- (i) Maintenance of data for possible future socioeconomic evaluation (paragraph 2.26).
- (j) Program works not part of the sample will be prepared following the same procedures as those used in the sample (paragraphs 2.7, 3.20 and 5.29).

Poverty-targeting and social sector classification:

This operation does not qualify as a social-equity enhancing project, as described in the key objectives for the Bank activity set forth in the report on the Eight General Increase in Resources (document AB-1704). Nonetheless, the bus terminal component is expected to have a positive impact on state's low-income population and the disabled (paragraph 5.18).

Exceptions to Bank policy:

The federal government will guarantee repayment of Bank loan (including amortization, interest and fees), but not the local contribution or any other obligation of the executing agency, which is not its legal responsibility (paragraph 4.1). The financial analysis carried out indicates that the borrower has sufficient financial capacity to provide the counterpart funding needed for the program (paragraphs 4.30 to 4.52).

Procurement:

International competitive bidding will be used for works in excess of US\$5 million and for the procurement of equipment for over US\$350,000; an international call for proposals will be required for consulting services in excess of US\$200,000 (paragraphs 3.9, 3.10 and 3.30 to 3.33). The lump sum price and unit price systems will both be used for contracting civil works (paragraph 3.22).

I. REFERENCE FRAMEWORK

A. Introduction

- 1.1 The state of São Paulo covers a surface area of 248,000 km² and has 37 million inhabitants, representing 21.8% of Brazil's total population. At 148 inhabitants/km² the state's population density is seven times the national average. São Paulo is Brazil's most industrialized state, accounting for 35.5% of gross domestic product and one-third of its total exports. Its economic activities are sustained by its transport system, with the highway network its most important element. Other states also depend on São Paulo's transport system, given the latter's importance in national commerce, and a geographical location that obliges nearly all transport between the south and the east and northeast of the country to pass through the state. The same is true of the bordering states that use São Paulo's ports.
- 1.2 The proposed program envisages restoration work on approximately 1,000 km of roads in non-metropolitan regions of the state (US\$188 million), improvements to intra-urban bus terminals (US\$3.5 million), and strengthening of the highway department (US\$5.6 million). The latter component includes a training program and implementation of systems for road surface management, transport statistics, project engineering and environmental management.

B. The transport system

- 1.3 The state's 7,200 km of railroads and 2,400 km of navigable rivers have relatively few convenient links, independent from the highway transport mode. These two transport modes respectively account for 5.2% and 0.5% of the state's per km tonnage in bulk freight such as agricultural grains, cement and iron and steel products. Nearly all railroads run from the interior to the state capital. Just two meandering lines serve the port of Santos and there is no rail link with the port of São Sebastião. Rail routes between most cities outside the metropolitan area and those of neighboring states are indirect, deficient or non-existent, and they also use different gauges. The state has scant participation in the transport of iron ore, which represents 75% of rail freight in Brazil, and the railways have lost most liquid bulk transport to the pipeline system, which transports 0.8% of the state's freight. Practically all passenger rail services to the interior of the state were discontinued many years ago, because they generated deficits, were of poor quality and interfered with freight train operations. Moreover, buses provide an efficient service to all corners of the state, consuming one-third of the amount of fuel per passenger that trains were using.
- 1.4 Rivers with navigable segments flow towards the interior of the state and do not connect with its sea ports. Nonetheless, they do connect with the interior regions of Brazil's south, southeast and center-west, and also with Argentina, Bolivia, Paraguay and Uruguay.

- 1.5 The state has two international airports, along with 29 smaller airports for domestic flights. While important for international and inter-state passenger transport and high value freight, air transport carries just 0.3% of the state's freight.
- 1.6 The highway mode carries nearly all passenger traffic from the interior of the state and 93.2% of freight tonnage per km. Of the total 28,558 km of paved highways (under 15% of the entire road network), 1,182 km are federally owned, 9,804 are municipal, and 17,572 km belong to the state. The latter are subdivided into 14,518 km of simple paved two-lane highways, and 3,054 km of dual carriageway (a minimum of four lanes). Of the total state network, 94% is paved.

Table I-1
Highway length by type and jurisdiction (km)

Highways in the State of São Paulo				
Jurisdiction	Dirt road	Simple paved road	Paved dual carriageway	Total
Federal	0	802	380	1,182
State	1,146	14,518	3,054	18,718
Municipal	165,828	9,804	0	175,632
Total	166,974	25,124	3,434	195,532

C. The Metropolitan Transport Department and the institutional organization of the highway sector

- 1.7 The key role¹ of the Metropolitan Transport Department (STM) is to manage the 18,718 kilometers of roads in the state's highway network, and to regulate inter-municipal bus services and the municipal bus terminals used for this. The STM will be the executing agency in the proposed program (paragraph 4.1), acting through the São Paulo Highway Department (DER/SP), which is responsible for carrying out the functions mentioned above (paragraphs 4.2 to 4.23). DER/SP is also responsible for awarding concessions on the 3,536 km of highways operated by private firms, while operating a further 524 km of tolled highways itself. Part of the funding for DER/SP comes from royalties paid by concession holders, together with other tolls and transport fines applied on the highways it operates (paragraphs 4.24 to 4.29). Concessions are supervised by the Public Service Concessions and Permits Monitoring Commission, attached to DER/SP.
- 1.8 The Transport Department includes a public company, *Desenvolvimento Rodoviário S.A.* (DERSA), which was set up in 1969 to build, maintain and operate

¹ The SMT also manages ports, rivers and airways; the respective managerial units are not described here as they are not relevant to the proposed program.

the state's tolled expressways. With operation of most expressways now transferred to private firms, DERSA today manages a mere 226 km, while also administering implementation of the first segment of *Rodoanel*, the new orbital expressway planned for the state capital. The STM has provided incentives for interinstitutional collaboration between DERSA and DER/SP.

D. Private-enterprise participation in the highway sector, and commercial highway operation

- 1.9 The vast majority of roads in Brazil were built with funding from the National Highway Fund, which was subsequently abolished under the new Federal Constitution of 1988. The fund's liabilities were subsumed in general budgetary funds at the different levels of government (federal, state and municipal) with less than 1/5 of user charges being ploughed back into the highway system.² For decades now, highway rehabilitation and construction in the state has been done exclusively by private firms, regardless of the level of government concerned (federal, state or municipal) or the legal nature of the body responsible for the highway (ministry, autonomous local authority, public enterprise). Nearly all maintenance services are also now outsourced to private firms. Highway sector projects and studies in São Paulo are developed by private consulting firms, sometimes with participation from university organizations.
- 1.10 Although DERSA played a key role in creating the state's network of tolled expressways, it did not achieve this with toll revenues alone. Most investment funding came from the State, given the lack of financial markets with sufficiently long terms and sufficiently low interest rates to make independent construction financially viable. During inflationary periods there were financial difficulties in the DERSA system when the nominal toll rate was raised by less than inflation. The crisis in the state's public finances in the late 1980s and first half of the 1990s left it without the funds needed to expand the capacity of its expressway system by upgrading single lane roads carrying heavy traffic. The state government therefore decided to seek private-sector participation to expand the capacity and length of the highway system.
- 1.11 In drawing up its plan, the key objective of the Government of São Paulo was to improve and expand the capacity of the state's main highways, without requiring budgetary funding. It recognized that to be politically and financially viable, the concessions plan would need guidelines that took the interests of government, concession-holders and users into consideration, while also being consistent with the relevant legal and technical constraints. In order to attract the private sector, it recognized the need to charge higher toll rates than those charged by DERSA and DER/SP until then, and that additional state highways would have to be brought

² See A.C. Firmino and C.L. Wright, *Financiamento dos Transportes no Brasil*. Washington, D.C., 2001.

into the toll system. To persuade users to support the plan (and pay higher rates of toll and over additional highway segments), it would likely be necessary to provide new civil works and services or visible improvements on those currently existing.

- 1.12 The Transport Department started work on a plan to classify the state's highways according to traffic flows, location and technical characteristics. Based on this information, it selected 4,800 km of roads as warranting more in-depth studies, batching them together in 22 lots. To reduce opposition to the concessions program, each lot included a highway segment on which a toll was already being charged. This made the lot attractive to the private sector with the added possibility of generating new civil works and services. Thus, the tolled highways operated by DERSA and DER/SP formed the basis of the concessions plan, and would be transferred to private-sector firms/consortia. The users of most of these highways already enjoyed free rescue services in the event of mechanical problems or accidents. To offer users additional benefits justifying higher tolls or their extension to previously toll-free segments, it would be necessary to extend these services to single lane highways to be included in the lot, along with new civil works. These could involve duplication works that upgrade a single lane road into a dual carriageway, or extending or widening the capacity of an expressway, for example by adding an additional lane in each direction on the most congested segments. Some lots included combinations of these, with small-scale works, such as pedestrian overpasses, added in to improve transport safety.
- 1.13 Other criteria, of a legal or practical nature, also had to be addressed. The State considered it politically unfeasible to charge different tolls on each highway regardless of their technical characteristics, a constraint that led it to impose a flat toll for each highway category. The State thus rejected "lowest toll" as a bidding criterion, and used the other legal possibility available to it, namely the criterion of highest value paid to the State by the concession holder (for legal reasons it was not possible to use the broader criterion of "highest value or least subsidy"). The following additional considerations were also taken into account in making up the lots: (i) highway segments that were not commercially attractive but which it was desired to put out concession, needed to be bundled with part of the toll system currently operating and offer the user significant connections with the remainder of the paved highway network; and (ii) it would be impossible to include in the concession system segments on which it was physically, financially or politically unviable to implement and operate a toll system. Criterion (ii) ruled out highway segments in urban areas and other places where it was impractical to install toll booths or prevent users evading the toll by travelling by alternative routes.³ This

³ The State did not explicitly consider economic criteria that might discourage a highway concession, such as the "deadweight" cost of building and operating a toll system in relation to revenue collected. This issue is increasingly relevant, however, as highway lots with high traffic flows give way to those with smaller flows. Another issue that has become important in São Paulo is the effect of heavy trucks switching on to highways lacking the structure to support their weight, as a result of the toll.

principle also ruled out installing toll booths very close together, or between neighboring cities where the concession holder was responsible for maintaining longer stretches of highway with little traffic or alternative roads that were convenient for users. This practice could result in very high charges per km over short distances, thereby penalizing users that need to make several short journeys every day. The alternative of giving discounts or exemptions to such users is not always practical, and an insistence on charging higher tolls in such circumstances can compromise the political feasibility of the entire concessions program.

- 1.14 Lastly, it would not be possible to include in lots highway segments where legal restrictions or agreements prevented using the concession system. This criterion ruled out 750 km of tolled highways that continue to be run by DER/SP (524 km) and DERSA (226 km).⁴ Part of this length of highway could not be handed over in concession because of legal disputes over construction contracts. On another major road, there was an agreement with the affected communities that duplication of the single lane would be done using a combination of public funds and tolls to be charged only during the construction period. On conclusion of the civil works, the State and the affected communities then agreed to halve the toll, instead of abolishing it, so as to guarantee maintenance and the provision of breakdown and medical rescue services.
- 1.15 Application of these criteria reduced the number of lots from 22 to 12, as attractive segments were removed from some lots in order to make the others viable. Of the 4,800 km chosen for further study, 3,536 km were handed over in concession, with a further 790 km operated by DERSA and DER/SP, making up 4,286 km of state highways operated commercially (with tolls), or 89% of the total length of highway initially considered.⁵

Table I-2
State-owned tolled highways in São Paulo, by operator (km)

Type of road	DER/SP	DERSA	Private enterprise	Total
Single lane in each direction	106	0	1,577	1,683
Dual carriageway	418	226	1,959	2,603
Totals	524	226	3,536	4,286

⁴ DERSA and DER/SP engage private firms to operate toll booths, and have an agreement with a commercial bank, Caja Económica del Estado, for the financial control of the operation.

⁵ Private firms interested in the plan participated throughout the process (even carrying out their own studies) and informed the State of their position on the viability of the proposed road segments and lots.

- 1.16 The State of São Paulo succeeded in handing over the 12 commercially viable lots in concession, and it is now the sub-national government unit with the longest length of privately franchised highways (3,536 km) and highways with tolls (4,286 km) in the world: this total length is equivalent to 56% of the 7,707 km of tolled highways in United States, where only 88 km are operated privately. The length of highway under concession in the State of São Paulo is four times the distance put out in concession by the federal government (856 km). The Bank, acting through its Private Sector Department (PRI), participated in financing the three largest concessions (paragraph 1.43). Other institutions from the public banking sector also took part, in particular the National Bank for Economic and Social Development (BNDES). None of the 12 concessions was financed by private enterprise alone.
- 1.17 Given the lack of additional highway segments satisfying the concessions criteria in the state network, its highway concessions program concluded. Thus, in the short run the potential for new concessions in São Paulo is basically confined to the federal highways located in the state. The federal government has already franchised the Via Dutra highway (São Paulo-Rio de Janeiro), and has begun the bidding process for concessions on the other federal expressways in the state, BR-381 (São Paulo-Belo Horizonte) and BR-116 (São Paulo-Curitiba). The State has also applied for permission to franchise the remaining single lane federal highway in São Paulo (BR-153). The federal government, meanwhile, has temporarily suspended the process of delegating to states the right to franchise federal highways, after other states abandoned their programs or returned the delegated highway segments to the federal government—some of which had never been put out to concession, while others had been but had serious contractual problems.⁶
- 1.18 The total universe of highways under State jurisdiction considered eligible for the proposed program excludes all segments that are commercially operated, either by concession holders (which operate 3,536 km of the 4,286 km with tolls); DERSA, 226 km (5%); or DER/SP, 524 km (12%) (see paragraph 2.5).

E. Maintenance of the non-commercial State highway network, and characteristics of proposed interventions

- 1.19 Of the 18,718 km of state highways, 3,762 km are operated by concession holders and DERSA. This leaves 14,956 km in the hands of DER/SP, which covers its

⁶ Concession programs have faced intense political opposition and two national strikes by independent truck owners. This has resulted in a unilateral amendments to contracts in some states, abandonment of the program in another State, and redefinition of guidelines by the federal government. In São Paulo, contracts have been maintained, with acceptable adjustments being negotiated between the State, concession holders and users that did not fundamentally alter the contracts concerned (for example, it was decided to charge the toll in both directions at half the previous rate which was charged in one direction but not in the other).

network's maintenance needs out of its own revenues. These mainly come from tolls charged on the 524 km of highways operated commercially, plus "royalties" that concession holders pay each year to DER/SP (resulting from the "highest bid" criterion in selecting the operator for each lot), and fines (see chapter IV). The budget available to DER/SP for 2000 and 2001 includes US\$3,440 per km for routine maintenance and renewal of traffic signs, which is considered an adequate level of expenditure (see paragraphs 4.9 and 4.24 to 4.26).

- 1.20 As a result of the staff downsizing carried out over the last two decades, DER/SP has contracted private-sector firms to carry out maintenance work. These now provide nearly all such services, covering activities such as restraining vegetation on the right of way, keeping the drainage system clear, maintenance of embankments, repair of potholes on road surfaces and renewal of signposts and safety barriers.
- 1.21 The two main problems with contracted maintenance services are the difficulty of supervising the work done, and the existence of highway segments with structural defects that increase the cost of maintenance unduly or nullify its effects. The introduction of basic service units (UBAs) (see chapter IV) would solve the first problem, by affording daily (or even more frequent) reports of problems affecting the highway and its operation and use. Moreover, cross-referenced verification could be carried out within the system, since reports are made by different staff on different occasions for different purposes. This would reduce the number of faults that go undetected or do not get corrected by the contracted firms. The proposed program will significantly reduce the second problem by restoring roads to good state, enabling them to be easily and economically maintained for many years to come.
- 1.22 The program aims to rehabilitate road surfaces and small-scale drainage works, as well as major structures and embankments, and other components of the 1,000 km of roads it should be possible to cover with available funds. Rehabilitation is needed not because of a lack of routine maintenance, but because of the wear and tear caused over time and by intense heavy vehicle traffic. Over 10,000 km of the state's paved roads were built and paved for the first time between 1950 and 1969, and most of the remaining 8,718 km date back to the 1970s. Consequently, these are road surfaces, drainage works and major structures that have already had between 30 and 50 years of use. When they were originally built or paved, average traffic on single lane roads (one lane in each direction) would probably have been on the order of 300 to 800 vehicles per day. This justified designing the project with a road bed and surface of medium support capacity, with simple intersections and soft verges. Today, the road segments included in the program's representative sample carry between 2,316 and 10,042 vehicles per day (an average of 5,400 vehicles daily), including large numbers of commercial vehicles (buses and trucks).

- 1.23 The control of axle weight has traditionally focused on tolled highways, where most heavy truck traffic is concentrated. This task is supported by 13 portable vehicle weighing stations to deal with specific problems. Higher toll rates and an extension of their use, however, has diverted some truck traffic to alternative toll-free segments, with resultant damage to their road surfaces, which were never designed to support such traffic. To mitigate this problem, the state has acquired 28 additional portable weighing scales to be operated by third parties under DER/SP supervision, and it intends to acquire a further 12.
- 1.24 In the project's representative sample, it was found that many road segments were suffering from structural problems that could not be solved by simple resurfacing work.⁷ Moreover, the original simple project was not being applied to roads with average traffic of 5,400 vehicles per day. The road segments with structural problems require interventions at the road bed level, together with surface strengthening and the construction and paving of 2.5m-wide hard shoulders, improvements in highway and intersection geometry, pedestrian overpasses and other installations to protect pedestrians and cyclists. Such interventions significantly increased the per km cost of the work compared to the initial estimate, before data from engineering fieldwork was available. Nonetheless, they will result in highways offering improved transport safety and lower maintenance costs. Serious accident indices are likely to be cut by at least half as a result of correcting problems relating to intersection geometry, pedestrian crossings and unpaved verges, such that road surfaces should not require major attention for a further 10 years.
- 1.25 In defining the program universe, tolled highways were excluded, and only the non-privatizable highway sub-component under state jurisdiction was considered (for the other criteria applied, see paragraphs 2.5 and 2.7). The State has applied for Bank support to restore the first 1,000 km of roads requiring short-run civil works, and also to support its efforts to modernize the highway management system and improve user services provided by DER/SP.
- 1.26 The program also includes support infrastructure for interurban bus services in the state. DER/SP is responsible for regulating municipal interurban bus services and associated terminals, and has contracted studies to update the bus sector regulations. The program will give support for restoring and improving these terminals, including modifications needed to facilitate access and passenger circulation for all people, including those with disabilities. This will include building bus terminals in municipios that do not currently have one, which are among the poorest in the State.

⁷ In addition, multiple resurfacing work had created "steps" ranging from 10 to 30 cm between the road surface and the unpaved shoulder, which were dangerous and required correction.

- 1.27 Many existing bus terminals need restoration work. Others require reforms to improve access to transport for all users, since their layouts contain numerous features that impair safe vehicle circulation, as well as obstacles and barriers to pedestrian movement. Currently, there are few terminals that satisfy standards for providing facilities for disabled people.

F. Transport safety and access

- 1.28 It has been observed that many accidents could be avoided by alterations to aspects of transport engineering, even though accident bulletins do not mention this as a causal factor. The Bank has been proactive in this field, publishing a manual⁸ on the topic in three languages, and widely disseminating a technical note setting out the procedures required by the Bank and examining safety aspects in the projects it finances (a process known as “traffic safety audit”). In the proposed program, the large traffic volumes and frequent presence of populated areas led to special care being taken at the project design stage.
- 1.29 In order to provide guidance and examine traffic safety aspects in previous projects, a Bank consultant held a number of meetings with members of the executing agency and representatives of the firms involved. This procedure significantly improved traffic safety aspects and triggered a valuable learning process on this topic. In the proposed program, these efforts are taken further still. DER/SP has hired a traffic safety expert to run courses on diagnosing and correcting hazardous highway situations for project engineers and the DER/SP staff who analyze and supervise project preparation. This expert has also participated continuously throughout project development on issues related to accident risk.
- 1.30 The expert’s analysis made of the interventions planned on the sample highways suggests that corrections to geometry, intersections, pedestrian overpasses and other items can be expected to reduce serious accident rates by between 50% and 60%. Other safety-enhancing activities undertaken by the state include: (i) setting up UBAs (paragraphs 4.9 to 4.12); (ii) instantaneous accident diagnosis (including photographic evidence and witnesses); (iii) 30-day monitoring of accident victims; (iv) mapping of all critical accident points in the state (v) accident report (vi) procurement of highway police equipment, including 255 mobile and fixed radar sets; (vii) balances with photographic records of trucks that avoid passing over the balance; and (viii) educational and other activities aimed at implementing the new January 1999 transport code, which provides the country with a modern legal framework for traffic management. Although these measures have so far only been partially implemented, road deaths fell from 783 in the period January-April 1990 to 696 over the same period in 2001. This is equivalent to an 11% reduction,

⁸ Philip A. Gold (1998), *Traffic safety: applications of engineering to reduce accidents*. Washington, D.C.: BID (xi + 196 pp.).

despite traffic growth during the period. In addition, progress has been made in the state, on the issues of electronic monitoring and driver training.⁹

- 1.31 For over three decades, DERSA has provided leadership in formulating and implementing safety plans and measures, successfully reducing accidents to the point where it now places signs on expressways indicating the number of days that have passed since the last fatal accident. In some segments it has virtually eliminated serious accidents between vehicles altogether, with the help of electronic monitoring. In order to disseminate the DERSA model, the state requires concession holders to formulate, implement and monitor traffic safety plans. Other state bodies, such as the Metropolitan Urban Transport Company (EMTU), require bus companies to use tachometers and other monitoring equipment, together with “defensive driving” classes for drivers.
- 1.32 Measures to reduce accidents are doubly important in the case of vehicles that transport hazardous materials. Maps have been produced showing the main transport routes used by such products, classifying them by type and degree of hazard; and the program includes a management system to prevent accidents and respond more effectively to those that do occur (paragraph 2.23).
- 1.33 In addition, on the issue of accessibility, the program will make a substantial contribution towards modifying inter-municipal bus terminals that currently have layout features that obstruct the circulation of passengers carrying luggage, or those accompanying children or older adults, or passengers of limited mobility (paragraph 2.12). DER/SP has made use of a recent Bank publication¹⁰ in formulating its projects and to update its manuals; and its projects comply with the applicable Brazilian standard NBR-9050.

G. The program’s expected benefits and beneficiaries

- 1.34 The main benefits expected from the program are as follows: (i) lower transport costs; (ii) improved access to passenger transport in the state’s municípios, as well as to transport of agricultural, livestock and industrial production; (iii) higher safety levels in the transport of people and freight, decreased accident risk, shorter journey times and optimized itineraries; (iv) greater comfort and facility for circulation and user access in bus terminals in the interior of the State, eliminating aspects of existing functional layouts that obstruct the circulation of passengers travelling with children or those carrying luggage or school materials, or design defects that make

⁹ Alan Cannel and Philip Gold, *Reduzindo Acidentes: o papel da fiscalização do trânsito y do treinamento de motoristas*. Washington, D.C., 2001.

¹⁰ “Facilitando o transporte para todos”, Washington, D.C., IDB, 2001 (viii + 92pp), available in Portuguese and Spanish.

access impossible for disabled people; and (v) a medium and long-term reduction in maintenance and restoration costs on the highways addressed by the program, by carrying out rapid and comprehensive projects.

- 1.35 The state highway network is an essential element in enabling São Paulo's 37 million inhabitants to perform their social and economic activities, and it is the predominant mode of transport for finished goods and productive inputs, especially those of higher value added. The highway network is equally important from the social point of view. For example, it allows primary schoolchildren to travel by bus to schools in neighboring villages and cities. This yields better teaching outcomes than in other federal units where teachers are assigned to go to rural schools. Currently, secondary level and university students make intensive use of buses to attend micro-regional study centers.
- 1.36 The project will benefit all residents of the state of São Paulo, particularly those living outside the metropolitan area. To a lesser extent, it will also benefit residents of neighboring states who participate directly or indirectly in commerce with São Paulo in finished goods, inputs and services, together with users who travel between the north and south of Brazil and those who need access to the port of Santos, from states in the center-west and southeast of the country.
- 1.37 The state government realizes that achieving this requires a modern highway management system, focusing primarily on the user. This encompasses the entire process of project conception and execution, as well as improvements in the operation of highways and interurban bus services, and transport safety.

H. The Bank's strategy in the country

- 1.38 The proposed program is consistent with the strategy agreed with the country by the Bank, specifically in the following aspects:
 - a. **State modernization**, by modernizing the management of highway agencies; and
 - b. **Enhanced competitiveness and market access**, reducing the "Brazil cost" by lowering transport costs (see paragraph 2.19 of the country paper, dated 7 July 2000).
- 1.39 Indirectly the proposed program will also help to:
 - a. **reduce poverty**, by stimulating economic activity, particularly outside the metropolitan area, facilitating access to markets and to education and health services; and

- b. **preserve the environment**, by restoring areas degraded by previous interventions and implementing more effective processes for environmental conservation in highway programs.

1.40 The federal government's External Financing Commission (COFIEX) approved the preparation of this program at its meeting of 5 March 1998. The program has been assigned priority status by the Government of the State of São Paulo and has been authorized by the state legislature (Ruling 1,528, of 11 October 2000). It is also included in the fiscal adjustment agreement signed between the State and the federal government (see paragraph 4.51).

I. Experience of the Bank and other financial institutions

1.41 The Bank began its activities with the state in 1968, with a potable water project (BR-0011); this was then followed by other operations including sewerage in the metropolitan region (BR-0074), development of the University of São Paulo (BR-0136), pollution abatement in the Rio Tieté, stages I and II (BR-0190 and BR-0265) and a subway system in the city of São Paulo (BR-0163). This latter project is currently being carried out by São Paulo Metropolitan Railway Company (CPTM), in conjunction with the Metropolitan Transport Department (STM). DER/SP is the executing agency in a federal project to install dual carriageway on 90 km of the Fernão Dias highway located in São Paulo (loans 767/OC and 975/OC-BR). These operations amount to a total investment of US\$1,308 billion. In addition, a housing operation for US\$30 million is currently going through the approval process, entitled Support Program for the Cortizos Action Plan (BR-0298).

1.42 IDB financed projects in the State of São Paulo are showing satisfactory performance and are all expected to achieve their established objectives. The performance of executing agencies in the transport sector (CPTM and DER/SP) has also been satisfactory, although there were delays in the train project owing to hold-ups in one of the bidding processes in CPTM; and in the Fernão Dias highway project, fiscal adjustment affected the availability of federal government counterpart funding.

1.43 Acting through its private sector department (PRI), the Bank has extended loans amounting to US\$335 million to three private concession holders on state expressways (BR-0296, BR-0306 and BR-0312). None of the state's municipalities has received loans from the Bank for transport projects.

1.44 In 1987, the World Bank granted a US\$174 million loan for the highway sector, which was cancelled seven years later, 75% disbursed.

J. Lessons learned from previous highway programs

- 1.45 The Portfolio Review of 20 October 2000 highlights the successful conclusion of highway programs financed by the Bank in the States of Bahia, Paraná and Pernambuco. These have thoroughly satisfied their development objectives, like previous successful projects in Ceará and Santa Catarina. In 2000, RE1/FI1 examined the situation of the Brazilian transport sector (including its institutional aspects, see paragraph 1.46, for example), and tolls paid by highway sector users that get channeled predominantly to other sectors of the economy during period of fiscal adjustment in state and national government.¹¹
- 1.46 Highway agencies in Brazil have felt the impact of the far-reaching changes that have occurred in their external environment over recent decades. These include the elimination of tied financing, continuous budget cuts in the transport sector, increased hiring of consulting services and a reduction in the number of staff employed by highway agencies. In DER/SP specifically, there were 19,000 active staff members in 1983, whereas today there are around 5,000. This has had a negative effect on capacity in the engineering and environmental spheres. These areas will be strengthened in the proposed program and supported by the implementation of information systems (paragraph 1.48). At the present time, highway agencies are changing their organization and incentive systems to provide more efficient services to their users. The most successful reforms are those that have been carried out after a long period of consultation and internal study supported by specialized external consultants. The most successful organizational and operational changes did not initially change the formal structure in a far-reaching way.
- 1.47 The Transport Department is continuing this trend. For two years now it has been promoting seminars and internal studies on changes of focus in DER/SP work and organization, supported by experts from University of São Paulo and the Getulio Vargas Foundation. The highway decentralization and user service plan, consisting of installing basic service units (UBAs) to operate and maintain approximately 300 km each is already producing positive results (see chapter IV).
- 1.48 The Bank played a highly positive role in supporting institutional reform processes that have been promoted by state governments and/or sources within highway agencies, such as the case of São Paulo. The proposed program would complement such activities with training and by implementing systems for generating, exchanging, processing and making use of data in the fields of transport statistics, road surface management, project engineering and environmental management.

¹¹ *"Financiamento do Setor de Transportes no Brasil"; op. cit.*

- 1.49 The performance of the private sector in consulting activities and civil works depends essentially on the quality of the work done by public bodies. The financial and institutional crisis that has affected highway agencies has undermined their capacity to prepare studies and engineering designs and to supervise civil works adequately using their in-house staff. The result is that consulting firms are being hired to perform these services. A similar trend is emerging in the supervision of civil works. To guarantee service quality, the proposed program included key aspects in the terms of reference for engineering studies, adopting an integrated project approach (rigorously covering aspects of construction, hard shoulders, embankments, drainage system, environmental protection and transport safety).
- 1.50 DER/SP managers are incorporating all of these elements, realizing that such care will result in better quality civil works, longer useful life and cost reductions during the execution period. Alternatives were analyzed to reduce costs in all projects and their respective components. The proposed program will attempt to carry out road works under global price contracts, as a means of exploiting potential economies in civil engineering works and reducing the problems of supervision and amendments to contracts that have arisen in unit-price contracts.
- 1.51 In fact, such issues are more important than the planning aspects that can be analyzed with the highway design and maintenance model (HDM), which focuses endogenously only on road surfacing aspects. Here, the key to using the model is data quality, which requires preparing a reliable system of statistics on traffic and on bumps, cracks and roughness of the road surface, all updated periodically. The proposed program includes these elements.
- 1.52 Apart from incorporating lessons drawn from earlier operations, this program contains innovative features that could yield important lessons for future projects, on issues such as transport safety, bus terminals, control of the transport of hazardous materials and maintenance.

II. THE PROGRAM

A. Objectives and description

- 2.1 The program aims to contribute to the economic and social development of the State of São Paulo. Its main purpose is to reduce road transport costs on the highway network for which DER/SP is responsible. This will be achieved by carrying out civil works on a significant portion of the roads that are currently in a poor or regular state. Complementing this, to facilitate user access to the highway network and improve the service provided to them, work will be carried out in bus terminals, along with appropriate training and the implementation of highway management systems.
- 2.2 The program encompasses the following actions:
- a. Rehabilitation of pavement, shoulders, masonry works, and components of the drainage system on about 1,000 km of highway, including civil engineering works to stabilize embankments suffering active erosion. Engineering works will entail physical alterations to the pattern of traffic circulation, and the installation of safety devices in places and segments where accident risk is greatest. Such improvements include modifications to roundabouts, and the introduction of a third lane on uphill segments, together with the installation of pedestrian walkways, bicycle lanes and other devices where the highway passes through urban areas.
 - b. Work in interurban bus terminals outside the metropolitan area, ranging from small-scale interventions to facilitate circulation and use of installations by all people (including those with disabilities), to the construction of terminals in municipios that do not have one.
 - c. Institutional strengthening in DER/SP, including a training program in engineering and systems of road surface management, transport statistics and environmental management.

B. Targets

- 2.3 By the conclusion of the program in 2005, the economic costs of vehicle operation along the 1,000 km of highway improved in the program will have been reduced to the levels shown in table II-1 (see Annex II-1). Calculations will be made at constant March 2001 prices, using the HDM III-Q model. Road surfaces, hard shoulders, engineering work, drainage and signposting systems will all have been restored, embankments suffering from active erosion processes will have been stabilized, and the systems listed in paragraph 2.2c will have been implemented, together with their respective training activities. In addition, the statistics systems

needed to monitor the condition of other DER/SP operated roads will have been developed, and standards will have been set for their conservation, along with timetables for periodic maintenance and future restoration work.

Table II-1
Operating costs per vehicle in the program sample
(in US\$/km)

Alternatives	Year	Automobiles	Buses	Trucks		
				Medium	Heavy	Articulated
Without project	2001	0.199	0.712	0.357	0.469	0.890
	2005	0.219	0.763	0.403	0.521	0.973
	2008	0.243	0.826	0.445	0.569	1.051
With project	2005	0.188	0.685	0.322	0.430	0.830
	2008	0.189	0.687	0.323	0.431	0.832

C. Formulation of proposed program

a. Type of operation and investment categories

- 2.4 This operation is a global multiple-works program, with the following main investment categories: (i) civil engineering works to restore highways and to build and improve bus terminals; and (ii) consulting services for training, implementation of information and management systems, execution of studies and projects, and supervision of civil engineering works.

b. Project selection criteria

- 2.5 In order to define the highway component, DER/SP regional divisions examined the technical conditions of highways under their jurisdiction using the continuous visual inspection method. This excluded highways operating under concession or tolled highways run by DERSA or DER/SP (paragraphs 1.10 to 1.18). Approximately 4,200 km of highways under State jurisdiction were identified as problematic. Then, DER/SP contracted a specialized firm to measure irregularities, cracks and bumps in these 4,200 km, bearing in mind the quantity and type of vehicles circulating on each highway. The highway design and maintenance model (HDM III-Q), supported by data on the volume and composition of traffic flows, was used to prioritize the 1,000 km to be covered in the proposed program and to select the groups from the 422 km representative sample. Other technical criteria not included in HDM were also analyzed, such as the condition of road shoulders and embankments.
- 2.6 In order to define the bus terminal component, DER/SP informed mayoral offices in the interior of the State about this component and the relevant conditions. Priority was given to the renovation, improvement and reform subcomponent, given its low

cost in relation to the number of people served. This subcomponent is considered a priority in terms of the effectiveness of investments and it was found that 60 applications could be dealt with. Out of a total of 73 requests for new constructions, it was possible to respond to 20, which was done based on a needs analysis for each proposal. The lowest income municipios were selected from among those with clear need.

c. Representative sample

- 2.7 The representative sample of the program's highways covers a total distance of 422 km, with an estimated cost equivalent to 48% of the total value of the road works to be carried out under the program. These projects have all the technical, economic and environmental documentation necessary to allow execution to commence in the first year of the program. Preparation of the sample was contracted under complete terms of reference (see specifications in paragraph 1.49). Identical procedures will be used in the remainder of the program's studies and projects. If it proves possible to include more highway segments with the available funds, these will be selected from among the 2,500 km of highest NPV/km in the 4,200 km highway universe initially identified (paragraph 2.5), and under the terms of reference used for preparing the sample, supported by public inquiry and the Bank's resettlement policy (see technical file). Eligible highway segments are restricted to those in the network under DER/SP jurisdiction and they need to have internal rates of return of at least 12%. They do not include segments being operated by the private sector.
- 2.8 In the case of bus terminals, 15 construction projects were prepared (75% of the program total) and 32 projects for improvements, widening and reforms (53% of the total).

D. Program structure

1. Engineering and management (US\$10.95 million)

a. Studies and projects (US\$6.5 million)

- 2.9 Funding will be provided for project studies and designs in the representative sample, as well as for future projects to be included in the program corresponding to approximately 1,000 km of rehabilitation and improvement works.

b. Program management (US\$4.45 million)

- 2.10 The program coordinating unit (UCP) will have a consulting firm to advise and support it in its activities. These will include maintaining records of contracts, particularly those tendered under the global price system (paragraph 3.22), to make it possible to evaluate costs, quality and compliance, including amendments to

contracts (should these occur), and their efficiency. The audit of the program's annual financial statements will be performed by an independent firm of auditors.

2. Civil works and supervision (US\$219.71 million)

a. Highway rehabilitation and improvement works (US\$205.51 million)

- 2.11 This component includes highway restoration and/or reconstruction over a total distance of approximately 1,000 km, and civil engineering works to improve road characteristics. The existing road surface in these segments is in bad or regular state and almost at the end of its useful life. In addition to road surfacing and foundations, work will include construction of hard shoulders; repair and/or complementing of surface and underground drainage systems; larger scale structures (widening or modification of platforms); engineering work; highway safety elements (work on crossroads and access points, introduction of a third lane on steep uphill segments, work to protect circulation of pedestrians and cyclists, signposting, etc.); mitigation of the impact of new civil works, and, where appropriate, recovery of previous environmental deterioration.

b. Civil engineering works in bus terminals (US\$3.5 million)

- 2.12 This component includes the construction of 20 new terminals, together with improvements and modifications in a further 60 interurban bus terminals outside the metropolitan area, to provide a better service to all users, including those with mobility restrictions or disabilities. The component includes extension work, repairs to electrical and hydraulic installations, improvements in areas of circulation and public toilets, installation of beveled ramps, communications systems and access roads.¹² The supervision of these civil works will be carried out by DER/SP inspectors.

c. Environmental monitoring and supervision of highway restoration works (US\$10.7 million)

- 2.13 Highway restoration work will require permanently contracted supervision, including independent supervision of the environmental component. The program's environmental supervision will be done by a firm specialized in the environmental aspects of civil engineering works (paragraph 3.4). Supervision accounts for 5.3% of the cost of the program's civil works, with 87% corresponding to engineering aspects and 13% to environmental issues.

¹² To make it easier for people with wheeled suitcases and wheelchair users to move about.

3. Institutional strengthening (US\$5.57 million)

- 2.14 These actions will enable DER/SP to enhance the productivity and effectiveness of its work, by implementing modern systems for planning and analysis, together with the corresponding training.

a. Road surface management system (US\$1.5 million)

- 2.15 This is one of the systems that DER intends to develop to modernize the management of its highway network. A highway databank will be set up containing information on the following: the state of road surfaces; traffic volume and composition; maintenance and conservation problems detected; services in operation or contracted; the contracts themselves; and investments either scheduled or already undertaken. The data will be analyzed using the HDM model and other relevant instruments.

b. Transport statistics systems (US\$1.4 million)

- 2.16 A permanent traffic count system will be developed to make it possible to identify hourly vehicle flows in order to calculate the mean daily volume (MDV). For this purpose, there is provision for purchasing modern equipment and services of data collection, statistical analysis and their integration with other programs needed for the state's highway planning.

c. DER/SP environmental sector (US\$1.92 million)

- 2.17 An assessment will be made of DER/SP environmental management capacity, and measures will be recommended to strengthen it—especially training in the environmental assessment of highway projects. DER institutional strengthening on environmental issues will include the following actions: (i) implementation of an environmental management system; (ii) technical support and in-service training; (iii) collection, evaluation and ranking of environmental risk data in those parts of the DER highway network not included in the program; (iv) monitoring of positive impacts resulting from the program's civil works on a selected segment; (v) implementation of a highway environmental information system; and (vi) procurement of computer equipment and field services to provide the necessary support for service delivery.

d. Engineering projects sector (US\$500,000)

- 2.18 The capacity of DER/SP to supervise the engineering projects undertaken by private-sector firms will be strengthened, along with its capacity to evaluate projects and alternative solutions. Individual consultants will be hired to provide hands-on training during the two years in which the program's engineering projects and designs are to be carried out.

e. Training (US\$250,000)

- 2.19 Training activities will be related to the implementation of systems for traffic statistics, road surface management, project engineering and environmental management.

4. Concurrent costs (US\$2.57 million)

a. Expropriations (US\$500,000)

- 2.20 The figure given here is an estimate of possible future needs, since no cases of expropriations were identified in the sample.

b. Environmental compensation (US\$1.2 million)

- 2.21 This includes measures to compensate unavoidable environmental impacts, such as the suppression of vegetation and encroachment in protected areas, as foreseen in specific legislation, and also in the event of possible population resettlement. Compensation measures to mitigate impacts occurring in the execution phase of the program's civil works include the following: (i) correction of environmental degradation; and (ii) a program for monitoring positive impacts.
- 2.22 Environmental hazard will need to be surveyed and ranked in the remainder of the DER highway network, in order to identify critical cases that warrant immediate correction by DER.

c. Management of the transport of hazardous materials (US\$870,000)

- 2.23 The program for managing the transport of hazardous materials will include the following actions: (i) implementation of an emergency response plan for DER-operated highways; (ii) integration of communication center information systems among organizations engaged in transporting hazardous materials in the State of São Paulo; (iii) publication of legislation and rules on the transport of hazardous materials; (iv) training courses for managers in firms engaged in the transport of hazardous materials; and (v) purchase of vehicles and equipment for the highway police and the fire department to respond to emergencies.
- 2.24 The environmental and highway information system will be implemented digitally, in order to facilitate knowledge of relevant aspects of the DER/SP highway network.

5. Financial costs (US\$18.64 million)

- 2.25 This figure includes interest, credit fee, and inspection and supervision fees applicable to the future bank loan during execution of the proposed program.

E. Ex-post evaluation

- 2.26 In accordance with Bank policies, the borrower was consulted but decided not to undertake an ex-post evaluation. To enable the Bank to conduct a socioeconomic evaluation of the program after execution, should it so wish, the DER/SP will maintain the necessary data in the road surface management and transport statistics systems, including classified vehicle counts and evaluation of the number, nature and seriousness of accidents, together with information on the environmental conditions of the different projects.

F. Other aspects of monitoring and supervision

- 2.27 All components will be supervised and monitored by DER/SP and included in the project completion report (PCR). Means of verification are set out in the program's logical framework (Annex II-1) and will include an evaluation by the executing agency of the effectiveness of different components for system users (in the case of bus terminals, for example), and on the utility of the institutional strengthening components for DER/SP and other bodies involved, together with prospects for their continuation in the medium and long-term.

G. Total cost of the program and financing

Table II-2
ESTIMATED COSTS (IN US\$)

	TOTAL	IDB	LOCAL
1. Engineering and management	10,950,000	3,800,000	7,150,000
1.1 Studies and projects	6,500,000	650,000	5,850,000
1.2 Program management (including audit)	4,450,000	3,150,000	1,300,000
2. Civil works and their supervision	219,710,000	110,400,000	109,310,000
2.1 Highway restoration works (1, 000 km)	205,510,000	100,420,000	105,090,000
2.2 Civil works in bus terminals	3,500,000	350,000	3,150,000
2.3 Environmental supervision of road works	10,700,000	9,630,000	1,070,000
3. Institutional strengthening	5,570,000	4,045,000	1,525,000
3.1 Road surface management system	1,500,000	1,350,000	150,000
3.2 Traffic statistics system	1,400,000	1,260,000	140,000
3.3 DER environment sector	1,920,000	960,000	960,000
3.4 Engineering project sector	500,000	450,000	50,000
3.5 Training	250,000	25,000	225,000
4. Concurrent costs	2,570,000	555,000	2,015,000
4.1 Expropriations	500,000	0	500,000
4.2 Environmental compensation	1,200,000	120,000	1,080,000
4.3 Management of the transport of hazardous materials	870,000	435,000	435,000
5. Inspection and supervision	1,200,000	1,200,000	0
TOTAL	240,000,000	120,000,000	120,000,000
%	100%	50%	50%

III. PROGRAM EXECUTION

A. Executing agency

- 3.1 The executor of the proposed program will be the State of São Paulo Highway Department (DER/SP), which is part of the state's Metropolitan Transport Department (STM). This requires a valid contract signed between the borrower and DER/SP to execute the program and transfer the corresponding funds. The organizational structure of DER/SP involves 14 regional units that will be involved in program execution.
- 3.2 A program coordinating unit (UCP) will be set up for program management, consisting of two engineers—a coordinator and an assistant. The UCP will be established at the advisory level of the DER/SP Superintendency and will be supported by a consulting firm. The preliminary terms of reference for this firm's services have been drawn up by DER/SP and have received the Bank's no objection. The consultancy team will include a program manager, likely to be an engineer; a senior project engineer and three senior works engineers; a lead economist; an accountant; an accounts clerk; a specialist in bidding processes; a systems analyst; three auxiliary technical specialists; a computer operator; a secretary; and four drivers. In addition, there is provision for possible use of consultants on specific issues requiring higher levels of specialization. Creation of the UCP and confirmation of its staff will be a condition precedent to disbursement of the proceeds of Bank funding.
- 3.3 Selection of the firms to support the UCP and to provide environmental monitoring will be a condition precedent to the approval of contracts for highway and bus terminal works.
- 3.4 All of the program's civil engineering works will performed by private construction firms. Environmental and works supervision, along with the program's studies and technical assistance services, will be done by specialized consulting firms or independent consultants, as appropriate, to be hired by DER/SP in accordance with Bank procedures. The supervision of road works will take account of the state's division into three large areas, each encompassing between four and seven DER regional divisions. Thus, one consulting firm (or consortium thereof) would be responsible for supervising restoration works on all roads within its area of action. The supervision areas are as follows: Area 1: Cubatão (DR5), Itapetinga (DR2), São Paulo (DR10) and Taubaté (DR6); Area 2: Araraquara (DR4), Barretos (DR14), Bauru (DR3), Campinas (DR1), Ribeirão Preto (DR8) and Rio Claro (DR13); Area 3: Araçatuba (DR12), Assis (DR7), Presidente Prudente (DR11) and São José do Rio Preto (DR9). The contracting of environmental and works supervision will be a condition precedent to the commencement of highway engineering works.

- 3.5 DER/SP will be responsible for managing these contracts and supervising the services provided by the corresponding consulting firms. This organization's capacity and experience, with the support envisaged in paragraph 3.2, is considered sufficient to fulfil this function.
- 3.6 The bus terminals addressed by the program are under municipal jurisdiction; and the respective mayoral offices will be responsible for providing the respective plots of land in the case of new buildings: DER/SP will hire private sector firms for the works. Terminals not included in the sample will be selected on the basis of low cost in relation to the number of people served. In addition, wherever possible, new terminals will be located in lower-income municipios. Works supervision in bus terminals will be done by DER/SP inspectors. Where necessary, the works will include access roads to the terminals.
- 3.7 Before the first disbursement in the bus terminal component, DER/SP must present to the Bank the respective contract according to a model that has the Bank's no objection.

B. State of program preparation

- 3.8 Studies of technical, economic and environmental viability have been carried out, and 11 projects covering 422 km of highway have been designed. These were previously evaluated by the project team and make up a group of projects that can be put out to tender during the first year. Additional studies and designs have begun to be contracted; these will be concluded in the first half of 2002, thereby ensuring a satisfactory flow of projects for tender in the second year.
- 3.9 Consulting services on highway restoration projects contracted before approval of the proposed operation were hired under local bidding processes, in accordance with Brazilian law. These procedures adhered to the Bank's rules and procedures as far as possible.
- 3.10 To speed up processes for contracting program coordination services and roadworks supervision, bidding processes have begun with pre-qualification of consulting firms. These are international competitive bidding processes in accordance with Bank policies.
- 3.11 Out of the 20 projects planned for new interurban bus terminals in the interior of the state, 15 are now available, together with 32 of the 60 projects planned for restoration, improvement and expansion work (see paragraphs 2.6 and 2.8).
- 3.12 DER/SP has drawn up environmental management plans for the program's restoration works, since the characteristics of the engineering works do not require an environmental impact assessment (EIA). An environmental analysis of the program has also been prepared, and this sets out procedures to be used in preparing projects not included in the sample. These documents were all released to the public

on 4 May 2001, in compliance with the Bank's public information policy. The environmental report was approved by the Committee on Environment and Social Impact (CESI) at its meeting of 15 June 2001, and sent to the public information center (PIC) on 21 June 2001. Chapter 7 of the report provides a detailed description of the mitigating measures and environmental control programs recommended.

- 3.13 The DER/SP institutional strengthening component has already been defined, encompassing a training program and systems for road surface management, transport statistics, project engineering and environmental management. The terms of reference for most of these components have been agreed with the Bank and draft versions of the contracts DER/SP will sign with other bodies to carry out some of these components have been presented.
- 3.14 The project team gave its approval to republish a more complete version of the general procurement notice (GPN) in the United Nations periodical "*Development Business*".

C. Execution of program components

1. Advising the UCP

- 3.15 Before approvals of the contracts for works on highways or bus terminals, DER/SP will hire a specialized consulting firm to advise the UCP in the management and technical and financial control of the program's civil works (see paragraph 3.2).

2. Project studies and preparation

- 3.16 This component covers the preparation of studies for restoration and improvement projects, which, in addition to the distance covered by projects in the program's representative sample, along with others already contracted by DER/SP and currently underway (see paragraphs 2.7, 2.8 and 3.8), would amount to a total of approximately 1,000 km to receive program funding (see paragraphs 2.5 to 2.8).

3. Works supervision

- 3.17 The consulting firms to supervise the highway restoration and improvement work will be contracted early, to enable them to start works before the signing of the contracts for the activities they will be responsible for. The same applies to environmental supervision.

4. Civil works

- 3.18 In all the civil works envisaged in this program, contracts will be made with private-sector construction companies. Bidding processes will be grouped together to achieve economies of scale in construction, supervision and signposting, thus

making it attractive for international competition by allowing a single firm to submit bids for several lots. In places and segments where accidents are frequent or higher risk has been identified, the civil works will include safety signs, together with physical alterations to traffic circulation patterns and safety devices.

- 3.19 Where necessary, before starting any road works on stretches passing through urbanized areas, DER/SP will present the Bank evidence that DER/SP has taken the necessary steps to ensure that the public utilities whose networks and facilities could interfere with the works will take steps to facilitate them.
- 3.20 The sample did not detect the need for expropriations or resettlement. If this were to prove necessary in order to widen the right of way, affecting private properties and land plots, DER/SP will submit plans to the Bank for compensation and resettlement of the low-income populations affected, before the bidding process on those works is authorized.
- 3.21 Works involving improvement, modification or construction of bus terminals will be contracted with firms experienced in this type of construction.
- 3.22 Civil works, both on highways and in bus terminals, will in principle be contracted on a global price basis. Highway works will encompass all engineering and environmental aspects (paragraph 2.2a). The unit price system will also be acceptable should the DER/SP wish to use this for some or all of the works. Temporary signposting services during the works phase will be provided by the contractors concerned, and permanent services may be contracted by DER/SP with specialized firms, under terms of reference that have the Bank's no objection, and no more than three contracts, in keeping with the regional division of works supervision (paragraph 3.4).

5. Institutional strengthening

- 3.23 In preparing systems for road surface management, transport statistics, project engineering and environmental management with a view to modernizing and improving management of the DER/SP highway network, specialized firms or organizations will be contracted under terms of reference and bidding documents that have received the Bank's no objection. Road works contracts will include environmental, traffic safety and signposting components.
- 3.24 The training of DER/SP professional staff working directly with road surfacing, traffic statistics and environmental management systems will also be the responsibility of the firms contracted in the corresponding areas, under a training plan agreed with the Bank. Training in the project engineering area will make use of individual consultants (paragraph 2.18). In each case DER/SP and the Bank will agree the program content, together with the scope and terms of reference of the services to be contracted. These activities, along with interinstitutional

collaboration with DERSA, will enable DER/SP to manage its highway network more effectively despite the gradual loss of professional staff, until it proves possible to implement a permanent institutional solution in the medium term (paragraphs 4.13 to 4.19).

6. Land purchase to widen the right of way

- 3.25 Where relevant (see paragraph 3.20) and according to the cadaster of land plots and buildings for expropriation, DER/SP will negotiate compensation with owners and will obtain documentation showing that it has acquired the right to occupy the pieces of land concerned. Proof that it has acquired legal possession of the land plots is a condition precedent to putting the works out to tender.

D. Execution timetable and deadlines

- 3.26 The program execution and disbursement period will be four years, from the effective date of the loan contract. Physical initiation of all the works has to occur within 36 months after signature of the contract (the technical files contain the expected execution timetable). The revolving fund will be 5%.

E. Tendering of civil works, procurement of goods and hiring of services

- 3.27 Before calling for bids on each of the program's civil works, the executing agency will present evidence to the Bank of the environmental approval and permits required by national or state legislation, or else their corresponding exemption.
- 3.28 Before the Bank authorizes bidding processes for civil works or the procurement of goods for purchase, loan or transfer to the jurisdiction of other institutions not dependent on DER/SP, the latter will present the respective contracts to the Bank. This will formally establish the obligations to be assumed by the parties, and a commitment to allocate the funds needed for their operation and maintenance. Apart from the municipios participating in the bus terminal subcomponent, parties will include the responsible unit in the military police of the State of São Paulo (in the case of equipment procurement for highway police and the fire department for the management of hazardous materials).
- 3.29 In general, the civil works envisaged in the program are not complex and do not require any special technology, for which reason prequalification was not considered necessary. Nonetheless, the way in which the bidding is to be grouped will require specific criteria to be met in terms of installed capacity and financial soundness. For this reason it was agreed with the DER/SP to use the two-envelope system for the bidding process, with a guarantee or bond required for the proposal and execution of the work.
- 3.30 The results of recent bidding processes show that foreign construction firms are not really interested in highway works tenders in Brazil for amounts less than

US\$5 million. Accordingly, the lower limit on individual works or packets of lots, above which it will be necessary to call international competitive bidding (ICB) will be set at US\$5 million. Below this amount, the procedures established in local legislation will be followed; this also applies to civil works in bus terminals.

- 3.31 All procurement of goods and services for amounts equal to or greater than US\$350,000, financed wholly or partially with Bank funds, will also use ICB. For smaller amounts, procurement will use procedures set out in national legislation ensuring free competition and guaranteeing the quality of the products and services to be acquired, provided this does not conflict with Bank policies.
- 3.32 The contracting of consulting services for amounts equal to or greater than US\$200,000, financed out of loan proceeds, will require an international call for proposals (ICP). Contracts for smaller amounts will follow the procedures established in local legislation. In all cases, the bidding documents will be submitted to the Bank for its no objection.
- 3.33 Bank procedures for the contracting of works, procurement of goods and services and hiring of consultants will form part of the loan contract. Annex III-1 contains the proposed plan for bidding processes and contracts.

F. Recognition of expenses and retroactive financing

- 3.34 The borrower has requested recognition of expenses against the local counterpart funding incurred in preparing this operation, amounting to the equivalent of US\$6.5 million covering the 18 months prior to eventual date of loan approval.

G. Maintenance of works, installations and equipment financed with program funds

- 3.35 No more than six months following the commencement of highway works or the procurement of equipment or installations financed with loan proceeds, the executor will present the respective maintenance plan to the Bank. This will indicate the resources to be allocated, the frequency of the maintenance actions on the highway network for which DER/SP is responsible, and parameters to be used in assessing its effectiveness. As from the first quarter of the second year following contract signing, and until completion of the tenth report, the borrower will prepare an annual report containing the following: (a) maintenance performed during the previous year throughout the DER/SP network; (b) resources used; (c) a detailed assessment of the condition of the program's civil works, installations and equipment, as well as that of other state roads; and (d) the maintenance plan proposed for the following year. This report will be presented to the Bank in the first quarter of each year; if maintenance is found to be substandard, the borrower will take the necessary steps to rectify the situation. Agreements between DER/SP and the municipios will specify maintenance obligations in bus terminals.

H. Widening of right of way and relocation of low-income families

- 3.36 The program's works are expected to remain within the right of way currently exercised by DER/SP. Generally speaking, this stretches at least 20 m on each side of the center strip of the roads to be restored and improved, and is not occupied by low-income families. Nonetheless, if widening of the right of way becomes necessary, the borrower will follow the procedure set out in paragraph 3.25; and should it be necessary to resettle low-income populations, the corresponding Bank rules will be followed.

IV. THE BORROWER AND EXECUTOR

A. Institutional analysis

1. Borrower, guarantor and executor

- 4.1 The State of São Paulo will be the borrower and also responsible for the local counterpart funding. The guarantor will be the Federal Republic of Brazil, and the executing agency, the Transport Department of the State of São Paulo, acting through its Highways Department (DER/SP). The Federal Government will underwrite repayment of Bank financing (including amortization, interest and fees), but will not guarantee the local contribution, nor any other liability of the executing agency, which by law it is inappropriate for it to assume.

2. Nature and functions of the executing agency

- 4.2 The Transport Department has functions and responsibilities in relation to highways, ports, rivers and airports under State jurisdiction, and it also regulates public transport between the state's different municipalities.
- 4.3 The State Highways Department (DER/SP) is part of the Transport Department, and was created in 1934. On 26 September 1946, it became an autonomous body with legal status and its own assets under Decree Law 16.546. It has administrative and financial autonomy under the terms of Complementary Decree 7, of 6 November 1969. The basic regulation currently in force was approved by Decree 26.673, of 28 January 1987.
- 4.4 The main functions of DER/SP as established in that regulation are as follows: (i) to draw up a highway system plan for the state and approve the municipal road plan; (ii) to prepare the budget for executing the works and services needed for the state highway system; (iii) to prepare projects, build, conserve and operate the roads in the state highway system; (iv) to manage the state highway system, directly or by delegation, with guards, signposting, tolls, user fees, improvement contributions, expropriations, limitations on use and access to contiguous properties, and other actions within the power of administrative and traffic police; (v) to award concessions and permits and to inspect public passenger and freight transport services on the state highway network; and (vi) to collaborate with the municipalities in solving highway problems.

3. Institutional structure

- 4.5 The DER/SP administrative structure is comprised of collegiate bodies, higher management units and advisory units. The collegiate bodies are the Consultative Council and the Public Transport Commission. Higher management units cover

superintendencies, deputy superintendencies and offices (management, accounting and finance, engineering, operations, planning and transport).

- 4.6 The DER/SP operates 524 km of tolled roads contracted out to a private firm, with an agreement with the Caja Económica bank for the collection and control of tolls. DER/SP is responsible for maintenance on 14,432 km of untolled roads, 13,286 km of paved roads and 1,146 km of dirt roads.
- 4.7 Decrees 43.011 of 3 April 1998, and 45.525 of 13 December 2000, set up the public Service Concessions and Permits Monitoring Commission, in order to supervise highway concession contracts. This commission, which is linked to the DER/SP superintendent, functions satisfactorily in overcoming the problems encountered in tendering and managing highway concessions (see paragraphs 1.9 to 1.17).
- 4.8 On 1 March 2000, the state governor sent a proposal to the legislature to create a Public Transport Regulator for the State of São Paulo (ARTESP). This body is intended to replace the Concessions Commission and would have the job of regulating and supervising all public transport service modalities conceded, permitted and authorized by the State. It would have the legal status of an autonomous local government body, with its own financial resources obtained from a 3% levy on concession revenues. ARTESP would be better structured than the commission, by being established under law rather than merely by decree, but its objectives, revenue sources and functions would be similar. No deadline has been established for analysis, discussion and voting by the legislature, and amendments to the proposal are likely to be made before the creation of ARTESP is finally approved.
- 4.9 The 14 DER/SP regional divisions (DRs) are responsible for the inspection of works and services, as well as operating the highways and certain activities relating to monitoring and data collection on the condition of the network. Some of these activities are being transferred to the UBAs, so that the future role of each DR will be to coordinate those functions and carry out strategic planning for its area of action, instead of executing or supervising services directly. Over the last three years, DER/SP has looked at alternatives for operating the highway system more effectively and serving its users better, and it has decided to transfer the majority of DR staff to the 57 basic service units (UBAs). DER/SP has already set up 21 of these units, each of which is responsible for the operation and conservation of about 300 km of roads.
- 4.10 The concept of “operating” a road originated when DERSA was set up in the 1960s. It means that the body responsible for the highway constantly monitors it to detect problems that could impair traffic circulation or user safety, and immediately take the steps needed to re-establish traffic flow and safety. For this purpose, each UBA has a fleet of vehicles (breakdown truck, ambulances, vans) obtained under leasing contracts with private firms. Drivers are provided by the leasing firm, and

the working team consists of the driver and one or more DER/SP staff members. The breakdown truck is kept parked in a strategic site, while the other vehicles circulate along the highway, reporting to the communications center by radio on any irregularities encountered and taking steps within their power to solve them. For example, if the team in a van encounters a hole in the road, it stops the vehicle, cordons off the area and fills the hole immediately. If it comes across an accident, it again cordons off the area, provides first aid and calls the ambulance services and other emergency vehicles to attend to the victims and remove damaged vehicles; if it finds obstacles on the road, it removes them or calls for a breakdown vehicle; in the case of breakdown, it identifies the problem and solves it directly (in the case of a minor problem such as running out of gasoline or changing a tire), or calls a tow-truck to take the vehicle to a safe place (in the case of a major problem).

- 4.11 To give an example, in Cotia near the city of São Paulo in February 2001, UBA teams lent assistance in the following cases: 90 accidents (involving 51 victims); 259 cases requiring a tow truck; 826 breakdowns; 1,003 obstacles on the road; and 2,081 other calls received from users. In the case of accidents, an immediate on-site diagnosis is made, involving a diagram and interview of witnesses; this is followed by a more in-depth diagnostic study carried out in the UBA with a larger group, where an attempt is made to identify causes and decide whether improvements could be made to the road, to signposting or other factors to prevent future accidents in the same place or of the same type.
- 4.12 Each UBA is also responsible for maintaining the road, inspecting services provided by contracted firms and reporting deficiencies encountered, such as keeping drainage systems clear, and preventing vegetation encroaching on the edge of the roadway or obscuring road signs, etc. The effectiveness of inspection is enhanced to the extent that some of the responsibilities assigned to a given team can also be observed and reported by other teams, thereby reducing the likelihood of defects in its area being missed. This supervision scheme and the amounts the state is investing in maintenance (paragraphs 1.19, 4.9 and 4.24 to 4.26), are considered sufficient to guarantee adequate road conservation.

4. Human resources

- 4.13 The active staff of DER/SP has been steadily downsized in accordance with the policy to outsource services and not fill most of the vacancies arising through retirement, transfer and resignation. From an all-time high of 19,000 active staff in 1983, the number had fallen to 8,777 by 31 December 1994 and to 5,209 by 31 December 2000. Currently the payroll consists of 292 engineers, 2,476 middle and higher level technical and professional staff, 189 machine operators and 2,252 workers, the vast majority of whom in the past carried out routine manual maintenance work which today is undertaken through contracts with private firms. Most operators and manual workers are being absorbed into the UBAs (paragraphs 4.9 to 4.12).

5. Institutional changes being carried out or under study

- 4.14 With regard to the changes envisaged for DER/SP, by the end of 2002 an additional 36 UBAs will be set in motion (completing the planned total of 57). This will entail redeploying personnel and training staff from other sectors—this is done by DER/SP personnel themselves and has been welcomed by them. Staff working in UBAs directly perceive the utility of their service for users, which has helped increase satisfaction with the work of DER/SP among users and staff alike.
- 4.15 Most of the staff who worked in maintenance activities that have now been privatized are expected to join UBAs. The number of people not absorbed in DER/SP functions is expected to be small, and the balance will be made up over the next few years as a result of retirement and voluntary transfers to other state bodies.
- 4.16 The other change planned in the DER/SP involves modernizing key processes in the management of the state highway network. This consists of implementing traffic statistics, road surface management and environmental management systems, as well as strengthening capacity to evaluate and direct engineering projects, together with training activities for staff carrying out these functions (see paragraphs 3.23 and 3.24). Apart from these activities included in the program, a computer network is to be implemented (this is already in process outside the program), and the number of computers in DER/SP will be increased.
- 4.17 It is recognized that the autonomous local authority structure offers DER/SP little flexibility on wages and procedural matters. This makes it difficult for it to hire and retain engineers and other skilled professional staff, and to manage contracts in a flexible way. Accordingly, the state government is studying ways of modernizing the processes for hiring staff and contracting studies, works and projects under private sector rules, so as to avoid the complex procedures that not only DER/SP, but also the waterway and airways departments are required to follow. The various scenarios being studied include the following: (i) expansion of DERSA functions to absorb part of the work currently done by DER/SP; and (ii) creation of a transport infrastructure company (CIT), as a second public enterprise. This would reduce DERSA functions to a single project, namely construction of the “Rodoanel”, an orbital expressway around the city of São Paulo. Given the time it took to set up ARTESP, the option of creating a CIT is expected to take over two years.
- 4.18 Until one of these scenarios is decided upon, the state is promoting interinstitutional collaboration with DERSA and hiring consultants to make up for the lack of professional staff in certain sectors of DER/SP. In the medium-term, the state will have the options of gradually transferring DER/SP functions either to DERSA or to CIT. In any event, DER/SP will continue to exist for an indefinite period because the vast majority of its 5,000 staff enjoy job tenure and many would prefer to remain in the DER/SP and receive all the benefits that the law offers to public-sector employees on retirement. For these reasons, the risk of institutional

discontinuity is considered manageable during the long process envisaged in which the state will adapt DER/SP and its highway agencies to the external and internal context in which it now operates.

6. Staff training

- 4.19 The training of DER/SP staff is the responsibility of the management office training section. In the current program, this entity will implement road surface management, transport and environmental statistics systems, and will strengthen the highway engineering area. A specific training program will be added to implementation of each of these systems (paragraph 3.24).

7. Financial management and control of budgetary execution

- 4.20 The management of financial resources and control of DER/SP budgetary execution is carried out by its accounting and finance division. Financial management is integrated into the state's financial system, managed by the Finance Department of the State of São Paulo under the "single account" mechanism. The Finance Department controls the accounts of the state's public bodies and makes the respective payments. All the activities mentioned are currently showing a satisfactory level of execution and control.
- 4.21 The DER/SP budget originates out of those prepared for each of its bodies, offices or divisions, which are submitted to the accounting and finance office for consolidation. Once the consolidated proposal is approved by the DER/SP superintendent and the Transport Department, the budget is then sent to the Planning Department. The São Paulo state legislature is responsible for final approval.

8. Accounting

- 4.22 The executing agency, acting through DER/SP, will be responsible for the following: (i) maintaining adequate accounting and financial records and an internal control system to verify contracting and expenses made with the proceeds of the loan and local counterpart funding charged against the project; (ii) these records will be kept in such a way as to permit separate identification of the management of project funds compared to other resources managed by DER/SP; and (iii) preparing the program's annual financial statements and presenting them to the Bank, along with a six-monthly report on the revolving fund, and other financial reports as requested.

9. Audit

- 4.23 No less than 120 days after the end of the fiscal year, the executing agency, acting through DER/SP, will submit the program's financial statements audited by a private firm of auditors acceptable to the Bank. This audit will be financed with

proceeds from the Bank loan, and will be carried out under terms of reference agreed with the Bank.

B. DER/SP financial analysis

- 4.24 Considering the historical uses and sources of DER/SP funding over the last five years (see technical file), internally generated revenues have been particularly important on the income side. In 2000, these totaled US\$206 million, of which 87% came from the following: (i) tolls that the agency receives from tolled highways operated directly by DER/SP (US\$24 million); (ii) "royalties" paid by concession holders (US\$97 million); and (iii) fines imposed for traffic offenses (US\$58 million). Revenue from tolls themselves fell from US\$131 million in 1996 to US\$24 million in 2000, as a result of concessions and a halving of the toll on one of the two highways that it still operates directly (see paragraphs 1.12 to 1.15); this has been partly offset by royalties (US\$97 million in 2000). In that year, internally generated funds of US\$206 million exceeded transfers of US\$178 million from the state treasury.
- 4.25 In 2000 the main expenditure categories were highway management, operation, maintenance and construction. General management (US\$161 million) encompasses the following categories: (i) current staff (US\$34 million); (ii) retired staff (US\$43 million); (iii) judicial sentences (US\$39 million); (iv) debt payments (US\$25 million); and (v) other expenses (US\$20 million). Expenditure on current staff accounts for 8% of the total, while expenditure relating to inactive staff exceeds the former by 27%, reflecting the larger contingent of retirees (see paragraph 4.13). Between 1996 and 2000, expenditure on active staff was cut by more than half, from US\$72 million to US\$34 million, while that on inactive staff fell from US\$51 million to US\$43 million, reflecting, among other things, a freeze on nominal wages.
- 4.26 Contract maintenance expenses in 2000 came to US\$51 million, equivalent to US\$3,440 per km of the DER/SP-maintained network. In addition to this, there was expenditure on staffing and materials for work that DER/SP undertakes with its own staff, and some of the activities involved in operating highways. Total maintenance expenditure grew from US\$44 million in 1996 to US\$57 million in 2000, while its composition has changed radically, with direct management expenses declining from US\$28 million to US\$5 million, and expenditure relating to subcontracted firms rising from US\$16 million to US\$51 million over the same period.
- 4.27 As regards highway construction and surfacing work, two large projects stand out: the Fernão Dias highway, partly financed by the Bank (see paragraph 1.41) and the western stretch of the future "Rodoanel" in the metropolitan region of São Paulo, which has federal participation. Local highways are municipal roads paved by DER/SP, conservation of which is the responsibility of the respective municípios.

- 4.28 Historical figures show atypical results in 1997, when US\$376 million was paid on debts and amortization. This mainly corresponded to amounts owed to subcontractors left over from the two previous administrations (see paragraph 4.30 to 4.50). Between 1997 and 1999 there were also significantly higher expenses than in other years, resulting from the highway construction and surfacing work, reflecting the pace of work on the Fernão Dias expressway and the first stretch of the Rodoanillo.
- 4.29 The size of the agency's internally generated current revenues, which in 2000 amounted to US\$206 million, is notable. Against this, DER/SP spends US\$75 million on maintenance, operation and police support on the highway network, and a further US\$161 million on management, giving a total of US\$236 million. As a result, it depends very little on transfers from the state to cover its basic expenditure. Some compensating adjustments are expected in the future, with a slight reduction in the real value of transfers from concession holders and a cut in expenditure relating to judicial sentences. This has been happening since 1998, as issues left pending from previous administrations get resolved. The situation is more favorable than in other highway agencies to have received bank funding for their programs, which augurs well for the financial viability of the proposed operation (see paragraph 4.52).

C. Financial analysis of the State of São Paulo

- 4.30 Implementation of the *Real* Plan in 1994 brought benefits to the Brazilian economy and population, by eliminating hyperinflation and laying the foundations for a recovery of economic growth. Nonetheless, the plan had the side-effect of aggravating fiscal problems in all spheres of government. High real interest rates on public debt, together with the new rights granted to public-sector workers in the 1988 Constitution, increased current expenditure, making it difficult to manage public finances and reducing capacity to invest in economic and social infrastructure. Inappropriate use of funds by most state banks added to the difficulties. All these problems existed in São Paulo in the years leading up to 1994.
- 4.31 Starting in 1994, both the federal government and the State of São Paulo took steps to resolve these problems, introducing new structural measures as described below, and setting limits on public expenditure. The national congress placed expenditure caps on public-sector payroll costs, through Complementary Law 82, of 27 March 1995 (known as the *Lei Camata*). Under this, total expenditure paid out of current revenue on current and inactive staff belonging to direct and indirect management, including foundations, public-sector firms and mixed ownership enterprises, could now not exceed 60% of the respective net current revenue for the fiscal year. This measure applies equally to the federal government, states, municípios and the Federal district.

- 4.32 Law 9.496 of 11 September 1997, laid down criteria for consolidating the debts owed by states and the federal district, and authorized the federal government to take them over and re-finance them under more favorable conditions. Anticipating this, the Government of São Paulo and the federal government signed a fiscal adjustment pact on 22 May 1997. The state's internal debt was renegotiated and six targets were established for it to comply with (paragraph 4.44 to 4.52).
- 4.33 In 1998, the federal government launched a fiscal stability program to restore public-sector solvency. This included: (i) short-term measures to achieve a fiscal surplus for the three following years and to stabilize the debt/GDP ratio by the end of that period; and (ii) institutional reform measures to promote long-term fiscal adjustment (institutional and social security reform, national state downsizing and tax reform).
- 4.34 Generally speaking, the fiscal adjustment measures have been successful, although it has proved impossible to implement the long-term reform package as expected. As many as 25 out of 27 states and 180 municípios signed contracts with the federal government to renegotiate their debts. This accounted for nearly all sub-national debt and resulted in longer terms, lower interest rates and a more favorable path for the reducing the debt, and for the payment of interest and amortization.
- 4.35 The federal senate passed Resolution 78 in 1998, making domestic and external borrowing by subnational governments (including guarantees, limits and authorization) conditional on the following parameters; (i) a debt/net real annual revenue ratio no greater than 2.0; (ii) annual expenditure on amortization, interest and other debt-related liabilities to be no greater than 13% of net real revenue; (iii) total debt no greater than twice net annual real revenue in 1998 (with this ratio being reduced steadily until 2008); and (iv) a primary surplus.
- 4.36 In order to ensure rigid control of the fiscal adjustment, Complementary Law 101 was passed on 4 May 2000. This became known as the Fiscal Responsibility Act, setting accountability rules for fiscal management in federal units. This legislation kept the limit on staffing expenses at 60% of net revenue and lowered the federal limit to 50%.
- 4.37 Fiscal adjustment agreements are reviewed periodically, and targets are updated via a National Treasury evaluation of the economic-financial situation of each subnational unit. The State of São Paulo has proven to be a positive example of fiscal adjustment. The most recent renegotiation between the federal government and the State was signed on 8 February 2000, and is a key element of the financial viability of the proposed operation.
- 4.38 On 3 August 2000, the President of the Republic sent a draft resolution to the federal senate. As a result, there are now three documents relating to the evaluation of São Paulo's fiscal situation, containing different criteria. For example, the

amount of new borrowing in any fiscal year may not exceed 18% in Resolution 78, but the equivalent figure is 16% in the draft resolution. The annual amount of interest payments, together with amortization and other liabilities on borrowing operations, may not exceed 13% of net real revenue in Resolution 78, while the draft resolution restricts such obligations to 11.5% of net current revenue for contracting new loans.

- 4.39 The various legal provisions are broadly compatible, except for the path envisaged for the ratio between the level of debt outstanding and net real revenue per year. The three documents mentioned set this ratio initially between 2.0 and 3.0, lowering it progressively to 1.0, depending on the rule concerned; the specific values and terms are different, as shown in the following table.

Table IV-1
Limits on the ratio between debt and net real revenue,
according to different legislation

Parameter	Resolution 78 of 1998/Senate	Fiscal adjustment agreement	Draft resolution
Critical ratio	2,00	2,75	3,00
Target	1,00	1,00	1,00
Deadline for achieving target	10 years	24 years	30 years
Intermediate ratio	1,50	2,01	2,00
Deadline for achieving intermediate ratio	5 years	12 years	15 years

- 4.40 If adopted, the draft resolution will revoke Resolution 78 of 1998. The latter is considered unrealistic as the initial value of 2.0 is not compatible with figures currently being displayed by many subnational units (São Paulo has a value close to 2.0 and is relatively well-placed among states on this index). The fiscal adjustment agreement takes precedence over the Resolution, as recognized explicitly in article 6 of the draft resolution.
- 4.41 As the fiscal adjustment agreement is founded on the recently renegotiated contract based on Law 9.496, of 11 September 1997, its parameters are relevant when analyzing São Paulo's fiscal situation. Specifically, it considers the value set for the debt/revenue ratio, in the agreement between the state and the federal government, of 2.75 in 2000 and 1.0 in 2024.
- 4.42 Prior to the agreement, debt service was paid at high Brazilian market interest rates over maximum three-month terms. The agreement granted the state a 30-year term at 6% real interest per year on 96% of the total debt outstanding. Without the agreement, the debt would have amounted to US\$68 billion in December 2000, compared with the US\$47 billion actually recorded. This 43% reduction represented a fundamental improvement for the state's finances, and was the

outcome not only of the agreement but also of complementary measures relating to extraordinary amortizations made with state assets, and transfers of the debts of privatized state firms to their new owners. The debt is largely domestic (92%).

- 4.43 The following points are relevant to when evaluating the financial situation of the State of São Paulo: (i) the state has been generating a primary surplus, thanks to strong tax collection and is headed towards financial recovery, reversing the imbalances of earlier years; (ii) the recovery of savings capacity makes the fiscal adjustment agreed with the federal government viable; and (iii) the state is displaying healthy fiscal indicators (table IV-2), including positive current and primary balances (excluding liabilities relating to the debt).
- 4.44 Table IV-2 shows the financial performance of the State in relation to the six targets set out in the fiscal adjustment agreement for the first year of the 2000-2002 triennium.
- 4.45 Target 1 sets a path for lowering the debt/annual revenue ratio to 1.0 by 2024. The state posted a value of 2.14 in 2000, well below the 2.75 permitted, and is projecting a figure of 1.61 for 2010, which is again below the agreed limit of 2.16.
- 4.46 Target 2 calls for positive primary results: in 2001, the state exceeded the US\$852 million target by 69%, achieving a surplus of US\$1.438 billion, which exceeds the 2002 target.
- 4.47 Target 3 puts ceilings on payroll expenditures on to current and inactive staff as a percentage of net annual revenue, to comply with the 60% limit set in the *Lei Camata* and the Fiscal Responsibility Act. In 2000, São Paulo achieved the target with a figure of 59.6%.
- 4.48 Target 4 seeks to guarantee increases in the state's real revenue capacity. For 2000, a reduction of 0.9% was permitted, but an increase of 3.7% was targeted for 2001 and 2002. Already in 2000, São Paulo had achieved a growth rate of 4.12%, which is above those set for the two subsequent years.
- 4.49 Target 5 involves continuity of programs relating to state downsizing (privatization and concession of public services), and administrative and asset reform. In 2000, the privatization target was US\$756 million but only US\$335 million was sold. This is explained basically by the fact that the state had already outsourced services and privatized the highest value firms and assets, which were easier to transfer to the private sector. The yearly figures were as follows: in 1997, US\$6.06 billion; in 1998, US\$9.768 billion; and in 1999, US\$5.524 billion. As a result, there is little left to privatize.
- 4.50 Target 6 restricts direct management investments and other capital expenditure paid by the Treasury to 9% of net real annual revenue in 2000; the state achieved a figure of 9.2% in that year, which broadly met the target, particularly taking into

account the excellent primary results obtained (target 2), which allowed more room for investment.

- 4.51 Lastly, the fiscal adjustment agreement set a limit of US\$772.5 million on new external borrowing by the state. The state has given priority to the proposed program (17% of the total amount and the only general economic infrastructure investment), along with projects relating to the fourth subway line, sanitation in the Santos region and housing in São Paulo.
- 4.52 The State of São Paulo has comfortably achieved fundamental targets 1 to 4. Projections for the debt path (see technical file) are favorable, and the operation is covered in the limit agreed with the federal government for external borrowing. The annual counterpart required by the program amounts to US\$30 million, equivalent to 2% of the state's primary balance in 2000, and to 0.14% of the state's internally generated revenue of US\$20.919 billion. Accordingly, it is considered that the state is in condition to contract the financing and provide the counterpart funding for program execution, as it has done in earlier projects (paragraph 1.42). Funds internally generated by DER/SP help generate a positive outlook for program sustainability (paragraph 4.29).

Table IV-2
Fiscal adjustment agreement targets and budgetary execution, 2000

Indicator	Target	Budgetary execution
1. Maximum ratio debt/net revenue (target achieved: 2000 = 2,14)	2000 ≤ 2.75 2001 ≤ 2.75 2002 ≤ 2.71 2003 ≤ 2.65 2004 ≤ 2.60 2005 ≤ 2.54 2006 ≤ 2.45 2007 ≤ 2.38 2008 ≤ 2.31 2009 ≤ 2.23 2010 ≤ 2.16	2000 = 2.14 2001 = 2.12 2002 = 2.07 2003 = 2.01 2004 = 2.96 2005 = 1.90 2006 = 1.83 2007 = 1.78 2008 = 1.72 2009 = 1.67 2010 = 1.61
2. Primary result (target achieved)	US\$852 million	US\$1.438 million
3. Maximum staff expenditure in relation to net revenue (target achieved)	64.3%	59.6%
4. Minimum annual growth of internally generated revenue (target achieved)	-0.9%	4.12%
5. Divestment, privatization and concession of public services (target not achieved)	US\$756 million	US\$335 million
6. Maximum ratio of investment expenditure/net revenue (target approximately achieved)	9.0%	9.2%

Sources: Targets: State of São Paulo fiscal restructuring and adjustment program 2000-2002, 2 February 2000; Budgetary execution: Target 1: Finance Department of the State of São Paulo; Targets 2 to 6: Report of the Secretary, Government of the State of São Paulo, Finance Department, fiscal year 2000.

Notes: Target 2: Values expressed in reais, corrected by the IGP-DI-FGV index and converted into dollars at the 2000 exchange rate (R\$1.83). Target 4: The same index was applied in calculating the real interest rate.

V. PROGRAM VIABILITY

A. Technical viability

- 5.1 The studies carried out for projects in the program sample employed modern methods of evaluation, calculation and sizing, and used internationally accepted engineering standards. They also included special methodologies developed by the DER/SP itself, for highways built on laterite soils in the west of the state of São Paulo. Reliable and recent grassroots information was used on traffic characteristics and the condition of existing roads, in deciding the key design parameters for the proposed civil works.
- 5.2 The unit prices used to determine sample project costs were obtained from the system maintained by DER/SP. This is periodically updated on the basis of changes in manual wages and materials and equipment prices.
- 5.3 Generally speaking, the proposed civil works do not involve complex constructions, so they are not expected to give rise to problems of technical viability. Nonetheless, as with the sample, care will be taken when undertaking works in urban areas, by making a traffic safety audit for solutions to be implemented, setting up traffic diversions and installing safety devices to prevent accidents, and environmental control measures to avoid undue discomfort for passers-by and the surrounding population.

B. Institutional viability

- 5.4 The program will be executed by DER/SP, which has been satisfactorily carrying out its role in stages I and II of the duplication of the Fernão Dias highway (BR-0162, with 98% disbursed and BR-0216, with 55% disbursed)—projects that are much more complex than this one.
- 5.5 To ensure coordination between the organizations involved in the program, and appropriate control of their activities, DER/SP will set up a program coordinating unit (UCP). Before starting the works it will also hire a consulting firm experienced in advising highway agencies in this type of program, to provide it support. The track record of the other agencies involved, such as the fire department (which will be responsible for controlling hazardous materials), and the highway police, suggest that these organizations have the capacity to take on such responsibilities and carry out the functions delegated to them in the program. In addition, DER/SP has already worked with mayoral offices on previous occasions, and has set up an operational scheme for the component to improve and construct bus terminals. The institutional scheme that will serve as a basis for this operation is deemed to satisfy the Bank's requirements for executing this type of program.

C. Financial viability

- 5.6 The program's local counterpart funding, to be met out of the State of São Paulo's internally generated resources, amounts to US\$120 million, corresponding to US\$30 million per year or 0.14% of the state's revenues.
- 5.7 The state's financial projections for the next five years (see paragraphs 4.30 to 4.52 and the technical file) show that its own resources are sufficient to cover current and operating expenses, deal with debt service, help finance the proposed program, and generate a surplus to cover other investments currently under execution and projected.
- 5.8 The analysis made in chapter IV on the finances of the state and DER/SP, together with the results quoted in the previous paragraph, show that São Paulo has the financial capacity to meet its obligations and make funds available on time to fulfil the commitments it will assume under this program.

D. Economic viability

1. Size of road work samples

- 5.9 A sample worth US\$90.6 million has been evaluated out of an anticipated total of US\$188 million of road work investments. This corresponds to 48%. The sample has not been subdivided into categories because all the civil works involve highway restoration with improvements in attributes.

2. With-project and without-project scenarios: costs and benefits

- 5.10 When a road surface is nearing the end of its useful life, the "with-project" scenario for restoring the road is highly favorable compared to the "without-project" alternative, and usually results in high rates of economic return. If the highway is not restored in time, additional damage will affect the road surface and/or the roadbed, considerably increasing not only the eventual cost of restoring or rebuilding the road, but also vehicle operating costs, as a result of the progressive deterioration of the surface. On the other hand, if the project is implemented in timely fashion, the cost of restoration is significantly lower, and maintenance becomes routine and periodic. The same is true of vehicle operating costs which are reduced to a minimum, and rise only very slowly over the useful life of the project, until such time as a new intervention is required.
- 5.11 The proposed program contains improvements that go beyond road surfacing. Some, such as the third lane on steep uphill segments on highways carrying a large number of trucks, lead to lower vehicle operating costs. Other interventions, such as the construction of 2.5m hard shoulders, will not affect vehicle operating costs, but are becoming necessary to protect the roadbed in areas with certain types of soil.

Shoulders and other improvements also generate benefits in terms of fewer accidents.

- 5.12 The total economic cost of each of the sample projects was calculated, including, where appropriate, the cost of interventions on the roadbed, the construction of hard shoulders, removal and recycling of worn out services, paving, construction of a third lane, pedestrian overpasses, walkways and cycle lanes, improvements in highway geometry and control and/or transport safety devices, and environmental improvements.
- 5.13 The calculated benefits include a reduction in vehicle operating costs, shorter journey times for occupants of automobiles and bus passengers, and fewer accidents. As regards improvements in the circulation of non-motorized transport, only the reduction in accidents was considered as a benefit.
- 5.14 Traffic growth rates were calculated by segment and vehicle category, and the total growth in the number of vehicles came out below 3% per year on all sample segments.

3. Results of economic analysis

- 5.15 The economic analysis used version Q of the highway maintenance design model (HDM-Q). Table V-1 summarizes the economic analysis of the sample by highway segment. Economic rates of return are all high, ranging between 24.9% and 75.3%, and the figures are quite robust to changes in the key variables of the analysis. For example, a 10% increase in costs, combined with a 10% reduction in benefits (shown in the final column of the table) reduces the economic benefits on the lowest-return segment to just 20.1%; the zero traffic growth hypothesis (not included in the table) has an even smaller impact.
- 5.16 The benefits basically consist of reductions in three cost categories: (i) vehicle operations, accounting for 86% of total benefits; (ii) shorter journey times for automobile and bus passengers (6%); and (iii) fewer accidents (8%). The value of accident costs avoided on the sample highways amount to US\$34 million, equivalent to 38% of the total cost of the sample highway works. Obviously, the non-economic benefits resulting from eliminating accidents are more important than those quantified here in monetary terms (e.g. reductions in lost output, repair and replacement of damaged vehicles, destroyed freight, etc.). Non-economic benefits include reduced pain and suffering for injured people and the survivors of fatal victims, temporarily and permanently disabled persons, etc.
- 5.17 The bus terminal component contained a large number of small-scale works, many of which involve adapting existing constructions to comply with accessibility standards. Given the diversity of such benefits and the high cost of attempting to

quantify them, it was decided to use cost-efficiency in the design stage of each project as the relevant economic criterion.

Table V-1
Results of economic analysis of roadworks, by road segment

Highway-Lot (km)	Investment* (US\$ thousand)	NPV (US\$ thousand)	IRR (%)	IRR (%) with + 10% on costs and - 10% on benefits
SP-063-2A (24.2)	4,533	8,991	42.2	35.0
SP-063-2B (30.3)	5,037	18,170	56.9	48.3
SP-255-10B (51.5)	11,700	80,131	75.3	65.3
SP-331-11 (58.0)	9,039	32,640	58.0	49.1
SP-294-18B (44.9)	12,830	51,081	60.5	51.7
SP-294-18C (44.7)	13,047	56,678	66.0	56.4
SP-253-21 (30.5)	6,953	10,409	34.7	28.3
SP-122-24B (15.9)	5,054	5,476	42.9	35.5
SP-563-27A (37.0)	8,741	36,533	66.4	56.4
SP-563-27B (43.3)	6,510	30,188	62.4	53.8
SP-294-28 (42.0)	7,151	5,808	24.9	20.1
Total (422.3)	90,596	336,105		

*excluding taxes

E. Impact on poverty

- 5.18 The program will benefit all residents of the state of São Paulo, directly or indirectly, and is not specifically targeted on poor sectors. Nonetheless, the bus terminal component is likely to mainly benefit lower- income populations. A key element in this component is an improvement in access conditions which, while benefiting all bus terminal users, are particularly important for people with disabilities or other mobility restrictions, as well as people that have difficulty in moving with luggage in buildings that have staircases and other architectural obstacles to reaching bus platforms and other parts of the terminal. This innovative component is expected to have a significant impact even in other states, by promoting the updating of rules and standards, and the modernization of bus terminals.

F. Social and environmental viability

- 5.19 From a socio-environmental standpoint, the highway rehabilitation program in the State of São Paulo is expected to improve current conditions in the hinterland of the highway segments to be restored.

- 5.20 Potential negative impacts generated by the program's civil works are less significant than those caused by existing environmental hazards, not only for the natural environment, resulting from erosion, instability of embankments and solid deposits in drainage channels, but also for the socioeconomic environment arising from safety risks for users and neighboring populations. A broader evaluation concludes that the program's planned interventions are positive in correcting negative situations detected in the right of way
- 5.21 Execution of the civil works will have impacts (described in paragraph 6.6 of the environmental report) which, while they can be classified as insignificant, should either be mitigated by suitable environmental control measures, provisional safety devices, traffic control and signaling, or else should be compensated for in accordance with environmental legislation.
- 5.22 Institutional mechanisms are also included to ensure adequate implementation of the various environmental programs and appropriate environmental management of the program.
- 5.23 The socio-environmental measures have been fully itemized and budgeted, the financial resources needed for their execution were included in the program budget, and their execution timetable is compatible with the works schedule. All studies and complementary services have terms of reference that have been analyzed and approved by the project team. In addition, drafts of the proposed contracts have been prepared.
- 5.24 Actions to strengthen DER/SP capacity in environmental management, drafting rules for executing engineering project designs, and reviewing specifications for carrying out road works, will ensure appropriate and continuous treatment of environmental issues in the various phases of the highway projects under its jurisdiction.
- 5.25 The program envisages environmental evaluation and control procedures to ensure compliance with Bank rules on eligibility, and in relation to designs/construction of segments not included in the sample.

G. Recommendations

- 5.26 To ensure adequate implementation of the environmental measures envisaged, it is recommended that the loan contract should include the contractual clauses presented below.
- 5.27 Before calling for bids on the civil works, the executing agency will present to the Bank evidence of: (i) having obtained environmental permits for the civil works, including the prior environmental permit (LAP) and the environmental permit for installation (LAI), or their corresponding exemptions; and (ii) in the event of the

need for population resettlement, verification of the existence of the respective resettlement plan for low-income populations, compliant with Bank policies.

- 5.28 As conditions precedent to approval the works contracts, the Bank will be provided with evidence of: (i) having hired the firm to provide technical support to DER environmental advisory services; (ii) having obtained all necessary administrative licenses and permits for environmental regularization of the civil works; (iii) having hired technical and environmental supervision services for the works; (iv) in the event of the need for resettlement of low-income populations, verification of having implemented the respective resettlement plan.
- 5.29 Procedures for the preparation of works designs: the designs of roadworks not included in the representative sample will be conceived and prepared in accordance with the technical, economic, environmental or other procedures used in preparing the sample, details of which were included in the program's environmental impact assessment (EIA).
- 5.30 Twelve months after signing loan contract, the borrower undertakes to present to the Bank, satisfactory evidence of having acquired computer equipment and field services for the DER environmental consultancy.
- 5.31 For the component for transport of hazardous materials, the borrower will present the following to the Bank: (a) 12 months after signature of the loan contract, formal contracts for transferring funds, prepared in accordance with the draft previously approved by the Bank, between DER and the responsible unit in the military police of the State of São Paulo, to procure equipment for the highway police and fire department for the management of hazardous materials, (b) 18 months after signature of the loan contract, integration of information systems for management of the transport of hazardous materials; and (c) 24 months after signature of the loan contract, conclusion of the plan for responding to emergencies on DER-operated highways.
- 5.32 For environmental monitoring the DER/SP must submit the following; (a) 12 months after signature of the loan contract, the contract for DER/SP environmental consulting services; (b) 18 months after signature of the loan contract, (i) the signed contract for implementation of the environmental road information system; and (ii) the assessment of environmental liabilities on DER/SP paved highways; and (c) 30 months after signature of the loan contract, evidence that the environmental management system has been implemented.
- 5.33 The borrower will submit semiannual reports giving a detailed description of the environmental measures adopted and the results of implementation, together with any problems and measures taken to solve them.

H. Risks

- 5.34 Two risks have been identified: (i) possible delays in preparing studies and highway projects, and their possible obsolescence if the civil works are not carried out in timely fashion; and (ii) gradual loss of qualified staff from DER/SP. In view of the proposals for institutional reform, both inertia and abrupt changes could raise difficulties in maintaining administrative continuity.
- 5.35 The program is expected to mitigate the first risk by preparing two large groups of studies and high-quality designs that can be put out to tender in the first and second year of program execution ("frontloading"). This would involve contracts with third parties, both for civil works and for their supervision. The second risk is being mitigated in practice by interinstitutional collaboration between DER/SP and DERSA, while more definitive solution alternatives are being studied for the medium-term. The proposed program will help mitigate this risk by institutional strengthening in the engineering and environmental units and will also help to increase the productivity of professional staff remaining in DER/SP, through training associated with the implementation of transport statistics, road surface management and environmental systems (paragraph 4.18). Institutional strengthening will enable DER/SP to administer its road network more effectively, with fewer professional staff in the medium-term, until a more appropriate institutional framework can be put in place (paragraphs 3.24 and 4.13 to 4.19). The systems will have permanent information recording features, enabling them to be absorbed by new organizations and to survive staff turnover.
- 5.36 It is also felt that the possible institutional changes do not raise a significant likelihood of administrative discontinuity. The main change envisaged for the short run, namely implementation of UBAs, has already been successfully started, improving both user service and maintenance—something that has been welcomed by staff (paragraphs 4.9 to 4.13). As all the alternatives for institutional change in the medium-term involve the permanency of DER/SP, the institutional risks are considered manageable.

LOGICAL FRAMEWORK
State of São Paulo highway program
(BR-0295)

OBJECTIVE	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS																																																								
the economic and social of the State of Sao Paulo.																																																											
e, easier and safer transport passengers and vehicles on the by the program.	<p>1. Vehicle operating costs on roads restored or maintained in the program, by 2005 and 2008 to have been reduced in relation to 2001, and compared to the without-project situation, according to the following table:</p> <table><tr><th colspan="8">Per vehicle operating costs in program sample (in US\$/km)</th></tr><tr><th rowspan="2">Alternative</th><th rowspan="2">Year</th><th rowspan="2">Cars</th><th rowspan="2">Buses</th><th colspan="3">Trucks</th><th rowspan="2">Artic.</th></tr><tr><th>Medium</th><th>Heavy</th><th>Artic.</th></tr><tr><td rowspan="3">Without project</td><td>2001</td><td>0.199</td><td>0.712</td><td>0.357</td><td>0.469</td><td>0.890</td><td></td></tr><tr><td>2005</td><td>0.219</td><td>0.763</td><td>0.403</td><td>0.521</td><td>0.973</td><td></td></tr><tr><td>2008</td><td>0.243</td><td>0.826</td><td>0.445</td><td>0.569</td><td>1.051</td><td></td></tr><tr><td rowspan="2">With project</td><td>2005</td><td>0.188</td><td>0.685</td><td>0.322</td><td>0.430</td><td>0.830</td><td></td></tr><tr><td>2008</td><td>0.189</td><td>0.687</td><td>0.323</td><td>0.431</td><td>0.832</td><td></td></tr></table>	Per vehicle operating costs in program sample (in US\$/km)								Alternative	Year	Cars	Buses	Trucks			Artic.	Medium	Heavy	Artic.	Without project	2001	0.199	0.712	0.357	0.469	0.890		2005	0.219	0.763	0.403	0.521	0.973		2008	0.243	0.826	0.445	0.569	1.051		With project	2005	0.188	0.685	0.322	0.430	0.830		2008	0.189	0.687	0.323	0.431	0.832		<p>1. Results of HDM-IIIQ applied in December 2006, together with technical criteria not considered in HDM, including the condition of hard shoulders and embankments, with the same prices and vehicle types, compared with DER/SP results in June 2000.</p>	<p>1. Maintenance on the rest of the continues to be adequate.</p> <p>2. Terminals not included in pro maintained adequately.</p> <p>3. Traffic monitoring and admin function adequately.</p>
Per vehicle operating costs in program sample (in US\$/km)																																																											
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	<p>2. By 31 December 2002, DER/SP to have developed a system of indicators (indicating the frequency of subsequent reports) to measure the following: (i) adaptation of installations and services in bus terminals; (ii) accident indices on the roads covered by the program.</p>	<p>2. (i) Expert inspection report and opinion surveys of DER/SP users, service providers and terminal managers; (ii) DER/SP reports on accident statistics.</p>																																																									

OBJECTIVE	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>OBJECTIVES</p> <p>restored and in operation.</p> <p>urban bus terminals improved.</p> <p>strengthened and trained to manage the state highway network.</p>	<p>C1. By December 2006, 1,000 km of restored roads to have been opened to traffic, according to works timetable contained in Annex.</p> <p>C2. a) By December 2005, 60 inter-urban bus terminals to have been improved.</p> <p>C2. b) By December 2005, 20 new bus terminals to have been built and put into operation.</p> <p>C3. a) By December 2005, the following systems or strengthening activities to have been implemented or carried out in accordance with the respective terms of reference: (i) traffic statistics; (ii) road surface management; (iii) environment; and (iv) project engineering.</p>	<p>C1. Certification of civil works by DER/SP and opening of road segments to traffic.</p> <p>C2. Technical report from DER/SP reception commission, including compliance with NBR-9050 regulating accessibility.</p> <p>C3. UCP reports and respective terms of reference. These reports will include an evaluation of the value of these systems to DER and other entities involved and, where relevant, the using public, together with an analysis of prospects for the continuity of activities and use of the systems.</p>	
<p>OBJECTIVES</p> <p>and (i) projects not included in the and (ii) terms of reference for supervision.</p> <p>documents prepared for civil and services supervision.</p> <p>documents published, proposals and firms selected.</p> <p>and services supervision contracts awarded.</p> <p>alternative projects prepared in the case of but non-viable projects.</p> <p>alternative projects updated in the event of delays in implementing the civil works.</p> <p>developed for inter-urban bus construction and improvement.</p> <p>alternative bidding documents prepared, proposals analyzed, firms selected and respective contracts awarded.</p>	<p>See detailed program budget and timetable.</p>	<p>Accounting records of the program coordinating unit in DER/SP.</p>	<p>Availability of counterpart funds for program's civil works and routine maintenance for all state highways.</p> <p>Macroeconomic and transport market conditions remain satisfactory.</p>

OBJECTIVE	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
reference prepared for studies, work and training activities. e bidding documents prepared hed, proposals analyzed, firms and respective contracts awarded.			

Procurement Plan									
Main project procurement	Financing (US\$ thousand)			Method: ICB or other (indicate)	Pre-qualification YES/NO	Publication			
	Total	IDB	Local			GPN	SPN		
						Prior YES/NO	Semester/ year	Press	
								Int.	Nat.
Support for program management	3,518	3,150 90%	368 10%	ICB	YES	YES	II/01	YES	YES
Audit	250		250 100%	LCB	YES	YES	II/02	NO	YES
Highway restoration works									
No. of lots 10	94,000	50,000 53%	44,000 47%	ICB	NO	YES	II/01	YES	YES
No. of lots 5	47,000	25,000 53%	22,000 47%	ICB	NO	YES	I/02	YES	YES
No. of lots 5	47,000	25,000 53%	22,000 47%	ICB	NO	YES	I/03	YES	YES
Bus terminal construction and improvement works	3,500		3,500 100%	LCB	NO	YES	II/02	NO	YES
No. of lots 50									
Roadwork supervision	9,300	8,370 90%	930 10%	ICB	YES	YES	II/01	YES	YES
No. of lots 3									
Environmental supervision	1,400	1,260 90%	140 10%	ICB	YES	YES	II/01	YES	YES
Road surface management system	1,500	1,350 90%	150 10%	ICB	YES	YES	II/02	YES	YES
Traffic statistics system	1,400	1,260 90%	140 10%	ICB	YES	YES	II/02	YES	YES
Strengthening of DER/SP environmental sector	1,920	960 50%	960 50%	ICB	YES	YES	II/02	YES	YES
Strengthening of project engineering area	500	450 90%	50 10%	LCB	NO	YES	II/01	YES	YES
Environmental compensation services	1,200	120 10%	1,080 90%	LCB	NO	YES	I/02	NO	YES
Management of hazardous materials transport	870	435 50%	435 50%	ICB	YES	YES	II/02	YES	YES

LCB = Local competitive bidding
ICB = International competitive bidding
LC = Local call for proposals

PROPOSED RESOLUTION

**BRAZIL. LOAN /OC-BR TO THE STATE OF SÃO PAULO
(Highway Rehabilitation Program for the State of São Paulo)**

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 State of São Paulo, as Borrower, and the Federative Republic of Brazil, as Guarantor, for the purpose of granting the former a loan to cooperate in the execution of a Highway Rehabilitation Program for the State of São Paulo. Such financing will be for the amount of up to one hundred and twenty million dollars of the United States of America (US\$120.000.000), or its equivalent in other currencies, except that of the Federative Republic of Brazil, which are part of the Ordinary Capital resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Financial Terms and Conditions" of the Executive Summary of the Loan Proposal.