

SECOND ROADS PROGRAM FOR THE STATE OF CEARÁ

(BR-0253)

EXECUTIVE SUMMARY

BORROWER: State of Ceará

GUARANTOR: Federative Republic of Brazil

EXECUTING AGENCY: Secretariat of Transportation, Energy, Communications and Works of the State of Ceará (SETECO) and Department of Buildings, Highways and Transportation of the State of Ceará (DERT)

AMOUNT AND SOURCE: IDB: US\$115 million (OC)
Local counterpart funding: US\$115 million
Total: US\$230 million

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

OBJECTIVES: The purpose of the program is to increase the efficiency of the highway sector through improvements in transportation and modern highway administration. The specific objective of the program is to reduce the cost of transportation on state highways in Ceará.

The program will therefore contribute to the economic and social development of the state, by expanding access to industrial and tourism areas in the metropolitan region, extending and structuring the network of paved roads within the state, and strengthening the system of road administration, related traffic safety services, and vehicle weight and hazardous material controls.

DESCRIPTION: The proposed operation is a global multiple works program designed to structure and consolidate Ceará's highway transportation system through a modern approach to road administration and planning. The highways concerned are part of transportation corridors (see paragraphs 2.4 to 2.7), meet minimum vehicular traffic requirements and link municipalities not presently connected to the paved system.

The road works consist of the following components and approximate lengths: (i) conversion into divided highway of 52 km of access roads to the metropolitan Fortaleza area (two stretches in industrial districts and one near the coast on the state's main tourist route) with a bike lane and sidewalks along the entire length; (ii) paving of approximately 420 km of highways to conventional standards and low-cost paving of approximately 450 km of access roads leading to municipal seats that are presently cut off from the paved system (both works include widening of structures); (iii) rehabilitation and improvement of pavement and shoulders along approximately 510 km of road; (iv) sealing and small works on 350 km of road; (v) procurement of equipment for routine maintenance, traffic safety and environmental protection; and (vi) institutional strengthening of the DERT.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environment Committee, at its meeting of June 19, 1996, classified this as a Category III operation. The environmental analysis and the environmental impact assessment of the sample works were released on March 17, 1997. The environmental report for this operation was approved by the Committee on the Environment and Social Impact on May 2, 1997, when it was classified as a Category III operation. It was forwarded to the Public Information Center on May 12, 1997.

BENEFITS:

The proposed program will lower transportation costs for persons and freight by shortening travel times between Ceará's main production centers. It will contribute in this way to facilitating the supply of agricultural and industrial products to the state and national markets, while improving product competitiveness in world markets and attracting tourism, an important source of foreign exchange earnings that generates employment in Ceará. The construction of bike lanes and sidewalks will speed up the movement of nonmotorized transportation, thereby benefiting the low-income population.

Upgrading of the roads and improvements in traffic safety will offer users greater convenience and safety. The paving and environmental measures included in the individual projects will lessen erosion, sedimentation and materials losses during rehabilitation and maintenance, thus reducing the quantities of such materials that are needed and the cost of transporting them.

The institutional strengthening measures and the orderly transfer of additional activities to the

private sector will enable the DERT to improve road administration, traffic safety and environmental services, even though it is cutting back its personnel.

RISKS:

The proposed operation has a lower degree of risk than the majority of similar programs. This is due to the experience that the executing agency has gained with a previous Bank operation (BR-0178, see paragraphs 1.5 to 1.7), the priority that the State has accorded the operation and the care that has been taken concerning the environmental and social issues associated with the works. The program also includes technical assistance and other institutional strengthening measures.

It may be necessary to revise the costs of the rehabilitation projects upwards, if delays should cause the works to fall behind schedule (see paragraph 5.28).

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

The Bank's strategy and the program of operations for Brazil during the 1995-1997 cycle, as described in the country paper of February 1996, together with the objectives of the Eighth Replenishment, are consistent with those of the Government of Ceará, i.e. to systematically eliminate the causes of poverty (and mitigate some of its social consequences) and to promote modernization of the economy.

The Bank's strategy as set out in the country paper supports the Brazilian government's approach of reducing the causes and factors that generate inflation by means of: (a) opportunities to modernize the State at the federal, state and municipal levels, including improvements in administrative and planning capacity; (b) support for economic liberalization and efforts to reduce the "Custo Brasil" through rehabilitation and improvement of productive infrastructure; and (c) reduction of inequalities and poverty. The country paper stresses, for the productive infrastructure sector, the importance of investing in works that will lower the high costs of production and of bringing the private sector into the process in order to reduce costs and increase efficiency.

The strengthening of the DERT and structuring of its use of the private sector fall under (a) and (b) of the strategy. The establishment of an organized system of paved highways will contribute to the development of agricultural, industrial and service

activities (especially tourism) that will generate additional jobs and revenues in the state.

**IMPACT ON POVERTY
AND SOCIAL
CONSIDERATIONS:**

The road works will be carried out in all parts of the state and will benefit all its residents to a greater or lesser degree. Thus, as specified in the Eighth Replenishment document (AB-1704), the proposed program fulfills the requirements of a program targeting the low-income sectors under the geographic criterion; it is not specifically aimed at women (see paragraphs 5.18 to 5.20).

**EXCEPTIONS TO
BANK POLICY:**

In accordance with the Brazilian government's request, the guarantee contract will not include a commitment from the federal government to contribute counterpart funding or to act as guarantor for the borrower's obligations to perform that are not within the legal jurisdiction of the federal government.

This decision is based on the country's constitutional and legal rules regarding administrative decentralization, and on the government's policy that seeks to bring public spending under control. The financial analysis shows that the borrower has the financial capacity to furnish the counterpart funding required for proper execution of the program.

**CONTRACTING OF
WORKS, GOODS AND
CONSULTANCY
SERVICES:**

The Bank's current policy on the procurement of goods, works, and services to be financed with program funds will apply. When IDB financing is used for procurement, international competitive bidding will be used for contracts valued at US\$350,000 or more in the case of goods, US\$5 million or more for works and US\$200,000 or more for consulting services (see paragraphs 3.28 to 3.30).

**PHYSICAL
COMMENCEMENT
OF WORKS:**

Within three years of signature of the contract (see paragraph 3.22).

**RECOGNITION
OF EXPENDITURES:**

Counterpart expenditures equivalent to US\$4 million may be recognized (see paragraph 3.32).

**SPECIAL
CONTRACTUAL
CONDITIONS:**

As conditions precedent to the first disbursement of IDB funds, the DERT shall create a Program Management Unit (condition already fulfilled) and appoint its staff and hire the consulting firm that will support it (see paragraph 3.2); and the pertinent agreements must have been signed and the personnel required to implement them must have been appointed (see paragraphs 3.4, 3.15, 3.19 and 5.27(a)).

Twelve months after signature of the contract with the Bank, the DERT shall have appointed an official to each of its resident engineers' offices for administrative and financial control purposes (see paragraph 4.11), and shall have reorganized the Internal Audit Unit (see paragraph 4.14).

The audited financial statements of the program must be submitted to the Bank together with an opinion by a firm of independent public accountants acceptable to the Bank (see paragraph 4.13).

Scheduled works that are not included in the sample must be prepared according to the same technical, economic, environmental and other requirements that were used in the preparation of the sample (see paragraphs 2.5 to 2.8, 5.25 and 5.27).

Six months after the signature of the contract, the DERT shall have: (i) agreed with the Bank on legal arrangements to encourage the continued presence for a reasonable period of time of personnel who receive training (see paragraph 4.9); and (ii) submitted the final versions of the environmental projects and studies together with the signed environmental protection agreement (see paragraph 5.27(b)).

Twelve months after signature of the contract, the DERT shall have contracted the firm that will assist with its modernization (see paragraph 4.6); it shall also submit evidence of the establishment of the environmental unit, holding of courses, preparation of rules, complementary projects, agreement on carriage of hazardous materials, and implementation of the resettlement and compensation plan (see paragraph 5.27(c)).

Twenty-four months after signature of the contract, the DERT shall demonstrate to the Bank that: (i) lines of action have been prepared for control of hazardous loads; (ii) the study on environmental liabilities has been completed; (iii) the complementary projects have been implemented; and (iv) the proposed environmental measures have been implemented (see paragraph 5.27(d)).

The prospective projects to award highway concessions to the private sector shall include the appropriate environmental measures (see paragraph 5.27(e)).

Quarterly progress reports covering the measures related to the resettlement and compensation plan are to be submitted (see paragraph 5.27(f)).

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Prior to the disbursement of funding for the various components, the respective agreements must be signed (see paragraphs 3.13, 3.15, 3.16, and 3.26).

I. FRAME OF REFERENCE

A. Background

- 1.1 The state of Ceará has 6.5 million inhabitants, two thirds of them in urban areas; 2.5 million live in the Fortaleza Metropolitan area. Annual per capita income (US\$1,876) was equivalent to 41% of the average for Brazil (US\$4,600) in 1995. It is estimated that 76% of the population falls into the low-income category (see paragraphs 5.18-5.20).
- 1.2 Since the mid-1980s, Ceará has appreciably improved its administration and the services provided to the population, and has been encouraging private investment, chiefly in manufacturing, trade and tourism. The state's revenues, which used to be insufficient to cover its wage bill, currently also allow for investment in social services and infrastructure. These changes have resulted in: (i) economic growth above the average for the country; (ii) a reduction in infant mortality between 1987 and 1995 from 95 to 46 per thousand live births; (iii) expansion of the coverage of water and sewer services; and (iv) partial rehabilitation of the highway network.

1. Transportation in the state

- 1.3 The port of Fortaleza annually ships 250,000 tons out and handles 2.5 million tons of inward traffic, predominantly bulk liquid cargo. Ceará has no navigable waterways and the railways are limited to two lines totaling 1,103 km of the federal railroad system (REFESA). The federal government has privatized various divisions of its railroad system in other regions of the country and is making investments in the northeast division to attract the private sector. In Ceará, the railroad has route, superstructure and rolling stock deficiencies and, what is more serious, the cargo being shipped is unsuited to this mode. In 1996, only 660,000 tons of freight were hauled (600 tons per km of line); three fourths of this volume was fuel (alcohol, gasoline and diesel) intended mainly for the roads sector, which would be vulnerable to competition from pipelines in the event of substantial increases in the flows. As a result, the road system will continue to be used almost exclusively for the transportation of persons and freight.

2. Road system

- 1.4 Only 6,677 km (14%) of the state's road system are paved, of which 1,957 km are federal highways, 373 km municipal roads and 4,346 km (65%) under state jurisdiction.

Table I-1
Ceará road system (km)

Highways	Paved	Earth or gravel	Total
Federal	1,957	334	2,291
Municipal	373	38,180	38,553
State	4,346	4,199	8,545
Total	6,676	42,713	49,389

B. Road maintenance and the first Ceará roads program

1. The first highway rehabilitation program (BR-0178)

- 1.5 The first Ceará roads program was started in 1990 to rehabilitate the deteriorated highway system and strengthen the DERT to enable it to administer its system. According to the project completion report prepared in 1996, the counterpart funding was disbursed on schedule and the DERT achieved the original target of rehabilitating 1,400 km of roads within the time set and at lower cost than estimated. The period was extended to allow rehabilitation of a further 499 km (36%); the proportion of the paved system in good condition increased from 16% to 64%, while that rated as satisfactory went from 43% to 26% and the part rated as bad from 41% to 10%.
- 1.6 From an institutional standpoint, the DERT has conducted numerous training activities in the use of software, planning systems (including the pavement management system using the HDM model), operations, and technical and administrative control at headquarters; it is making effective use of the equipment and software acquired. It has made significant progress in the operation of roads, vehicle weight and traffic inspection and, consequently, in the motivation of its personnel. It has converted the force-account maintenance system into a mixed system under which workers are provided by private contractors and work under DERT supervision; private contractors are also being used in areas where DERT personnel are not available. Routine maintenance has already been extended to the entire highway system and is being satisfactorily performed.
- 1.7 The funds available for the first program were insufficient to consider more ambitious targets. Not all the deteriorated highways were rehabilitated (see paragraphs 2.4-2.7) and expansion of the state's network of paved roads was not considered. Only six mobile scales were purchased, along with relatively little equipment for traffic inspection, thus limiting the geographic area that could be served. From an institutional standpoint, the aim was to implement simple actions which would have an immediate effect using the personnel available under the existing structure. The

establishment of data and communications systems between headquarters and the resident engineers' offices, the refining of quality control mechanisms at maintenance services in the engineers' offices, the improvement of quality control procedures for maintenance at the resident engineers' offices, the simplification of cumbersome bureaucratic routines and the improvement of the functional and geographic distribution of personnel were all left for a subsequent stage. The proposed operation includes the necessary measures for complementing the first roads program.

2. Federal highways in the state

- 1.8 The stretches of paved federal highway that are in a poor state of repair have been included in the Federal Highways Rehabilitation and Decentralization Program (BR-0195) which would be executed by the National Highways Department (DNER) and cofinanced by the IDB and the World Bank. The federal government intends to transfer jurisdiction over 629 km of highways to the State of Ceará, which would increase the state system by approximately 10%.
- 1.9 The National Congress is presently considering Amendment 81-B of 1995 to the Federal Constitution, which proposes creation of a highway maintenance fund. The DERT is preparing a complementary proposal for Ceará, with assistance from the Economic Commission for Latin America and the Caribbean (ECLAC) and the German Technical Cooperation Agency (GTZ).

3. The need to structure the system of paved roads

- 1.10 The Ceará road system has developed as a result of the implementation of part of the interstate connections included in the National Transportation Plan of 1973 and the paving, by the state, of roads linking specific cities. Eighty-six percent of the roads are earth or gravel, resulting in numerous discontinuities between the paved sections and a lack of direct road connections between important points of the system (including 27 municipal seats), which adds long distances to trips in the interior of the state. In the vicinity of Fortaleza's industrial and tourist centers, the congestion is such that it hinders access to the centers of industrial activity and the east coast, a situation that needs to be quickly resolved in order to facilitate development of the most dynamic sectors of Ceará's economy. On various stretches there are critical potential accident spots which require modifications to protect pedestrians, bicyclists and nonmotorized freight vehicles. The proposed operation aims to remedy these shortcomings in the system and rehabilitate deteriorated highways that were not included in the first program, based on selection criteria detailed in paragraphs 2.4 to 2.8.

4. Traffic safety problems

- 1.11 In 1995, there were 1,000 road fatalities and 4,232 nonfatal traffic injuries in the state of Ceará. The fatality index per 10,000 vehicles in Ceará is 23, as compared with 10 for Brazil as a whole, 2 for the United States and 3 in some European countries. Metropolitan Fortaleza accounts for 64% of registered vehicles and 61% of fatalities, the majority of whom (66%) were pedestrians.
- 1.12 These accidents are attributable to deficiencies in: (i) road design and other aspects of traffic engineering; (ii) the condition of the vehicles; and (iii) driver behavior. The latter is frequently the only factor cited in accident reports, but many accidents involve all three factors together; just correcting the road engineering deficiencies is at times sufficient to reduce the number of accidents at particular black spots by 50% or more. Improvements of this sort are particularly needed in Fortaleza where the majority of the victims are pedestrians and the volume of nonmotorized transportation is high (one of the program stretches has a flow of 3,500 cyclists and 5,000 pedestrians per day). Corrective engineering measures will accordingly be carried out as part of the program works on the highways involved. A Bank consultant has reviewed with DERT engineers all the road projects in the sample to ensure the inclusion of traffic safety measures, including those to benefit nonmotorized traffic. To strengthen this practice in the DERT and in the Traffic Department of the State of Ceará (DETRAN), the program envisages training courses in analyzing critical points and seeking solutions to the problems found as well as specialized consultancy services for DETRAN in conducting road safety technical audits.
- 1.13 The Ministry of Justice has coordinated the preparation of a new traffic code that the National Congress may approve this year. The new code increases the requirements for drivers and the penalties for violations, which will make for better supervision of traffic. The efficacy of such measures was demonstrated during the campaign which culminated in virtually universal use of safety belts in Brazilian cities.
- 1.14 At the state level, DETRAN is developing, with its own resources, a traffic accident information system for metropolitan Fortaleza, which in the near future will be extended to all Ceará's highways. The present operation will complement this system with training in the inspection of engineering and traffic control equipment projects. DETRAN will cooperate with training activities for the different military and police organizations having responsibility for traffic oversight and who provide assistance to accident victims; it will also develop driver education courses and special courses for violators. The operation will supplement this effort by means of: (i) procurement of equipment for the highway police (CPRv) patrols and firefighters (radar, breathalyzers, motorcycles, trucks for picking up stray animals, ambulances); (ii) contracting

of consultancy services for identifying more effective methods of education and road safety campaigns; and (iii) training in traffic engineering and technical inspection of accidents together with accident reduction projects.

5. Road administration

- 1.15 In the past five years, the DERT has improved its road administration and maintenance, notwithstanding a drastic reduction in personnel (44.5%). Out of its current 1,277 staff members, about 130 will be able to retire in the next three years, including some of its most highly qualified staff; the department will therefore have to develop and refine its services with fewer staff. The federal legislation protecting long-term employees combined with the state's restrictions on new hirings leave the DERT little leeway for adjusting its staffing levels to functional requirements or increasing technical personnel at resident engineers' offices in the interior of the state.
- 1.16 The DERT needs to simplify its internal procedures and set up information systems and procedures control between headquarters and the engineers' offices. It also needs to refine: (i) the supervision of private sector activities; (ii) the planning of works and activities; (iii) the use of the georeferenced information system; (iv) the pavement management model; (v) its management of environmental and social matters, traffic safety, and control of vehicle weights and hazardous freight; and (vi) care for victims of traffic accidents. The proposed operation includes studies on institutional changes required and the procurement of vehicles, equipment and computer and communication systems.

C. Environmental and social impacts

- 1.17 The environmental problems of the road sector are the following: (i) erosion and sedimentation in drainage systems threatens highways and nearby areas, the result of earlier works in which cuts and hollows were not shaped and plant cover was not restored; (ii) hazardous materials could spill in state water catchment areas; and (iii) in certain parts of the state, materials traditionally used in road construction have been depleted, so that they now have to be hauled in from a distance. Regarding this last point, deposits of materials such as lateritic soils are available locally and could be used if information on their behavior were available.
- 1.18 The program envisages repairing this environmental damage during rehabilitation work and includes, for each new project, appropriate environmental protection measures, such as preparation of rules and standards for road works in the state, identification of environmental problems of highways not included in the program, and the establishment of parameters for determining the responsibility for environmental problems in private sector concessions, if any.

There are also plans to install rigid barriers in critical areas where trucks could fall into watersheds, and to map the locations of nontraditional materials and establish experimental road stretches using these materials in order to determine their behavior.

- 1.19 The main social impact of the works is the resettlement of families where roads are to be made into divided highways, the effect of which will be mitigated by the resettlement and compensation plan (see paragraphs 3.18 to 3.20).

D. Private sector participation

- 1.20 The DERT contracts all rehabilitation services and road construction with private firms. It performs routine maintenance using a mixed system (paragraph 1.6) in order to utilize its own personnel (who have tenure) for supervision and other specialized functions. The department spends some US\$13 million a year on routine maintenance, US\$6 million less than would be needed to have the same work done exclusively under contract. Due to the progressive reduction in its personnel, the DERT has followed a strategy of increasing the geographic area and services contracted out to the private sector in stages, and concentrating its own personnel and equipment in certain maintenance districts. The proposed operation includes institutional strengthening measures to further develop the methods of contracting and supervising the services of private contractors. The DERT has also contracted a detailed study to determine whether it would be viable to award the maintenance and operation of a small network of divided highways in the Fortaleza metropolitan area to the private sector on a concession basis. This activity does not require Bank funding and will be continued independently of the program.

E. Benefits expected from the proposed program

- 1.21 The proposed program will lower transportation costs for persons and freight by reducing travel times between the main production centers in Ceará. It will stimulate national and international tourism, agricultural and industrial production and the competitiveness of the state's products in the local, national and international markets.
- 1.22 The improvement of the roads and of traffic safety will offer greater convenience and security to the users of Ceará's roads. In particular, the 50 kilometers of bike lanes that will be put in along the length of the divided highways will provide one of the longest vehicle ways for nonmotorized transportation in the Americas, thus producing a significant benefit for the mobility of the low-income population.
- 1.23 The implementation of various of the proposed improvements will lessen the loss of materials in maintenance and rehabilitation

work. This will reduce the environmental harm associated with the extraction and use of these materials and the cost of hauling them to the work sites. Existing environmental damage along the roads included in the program will be repaired. The proposed program will enable the State to adequately maintain the roads notwithstanding the reduction of its own personnel. The strengthening of the mixed system will enable the DERT to bring about greater involvement by the private sector without disrupting overall administration.

F. Strategy and justification for IDB participation

- 1.24 The Bank's strategy and program of operations for Brazil in the 1995-1997 cycle, as described in the February 1996 country paper, and also the objectives of the Eighth Replenishment, are consistent with those of the Government of Ceará, i.e. eliminating the causes of poverty (mitigating some of its social consequences) and promoting modernization of the economy. The Bank's lending strategy is aimed at supporting the following areas:

1. Modernization of the State

- 1.25 Priority is being given to improving planning and management capacity and reform of public sector activities, including the fiscal area. The proposed program will contribute to this objective through its institutional strengthening component and better utilization of the private sector in DERT activities. At the same time, the truck weight inspection program will help to verify the accuracy of turnover tax (ICMS) declarations. Accordingly, in the medium term, the program will enable reduction of public spending on roads, replacing reconstruction by less costly activities such as routine and periodic maintenance and truck weight inspections, while also preventing evasion of payment of the ICMS.

2. Productive infrastructure

- 1.26 Opening up of the economy, regional integration and reduction of the "Custo Brasil" call for priority investments in the transportation and energy sectors. The program will contribute to this end by reducing the cost of transportation between the state's main productive regions and with the rest of the country.

3. Social sectors, basic sanitation and environment

- 1.27 The program includes measures aimed at reducing road accidents, mitigating critical environmental situations and construction of 50 kilometers of bike lanes along the stretches that will be made into divided highway, thereby increasing the mobility of the low-income population and facilitating the use of an economical mode of transportation which does not pollute and involves low energy consumption.

- 1.28 For the productive infrastructure sector, stress is being placed on the importance of making investments in works that will reduce the high costs of the productive processes and also of involving the private sector in order to lower costs and raise efficiency. The strengthening of the DERT and better utilization of the private sector fit in with this strategy. The better structuring of the system of paved highways will contribute toward the development of agricultural, industrial and service (especially tourism) activities that will generate employment and additional revenue in the state.
- 1.29 In May 1996, the Bank received an official communication from the federal government assigning priority to the proposed program.

G. Experience of the Bank and other financial institutions

- 1.30 In addition to its first roads program (paragraphs 1.5 to 1.7), Ceará is also one of eight states participating in the Northeast Tourism Development Program (PRODETUR) financed by the Bank (BR-0204). One of the components of PRODETUR is expansion of the Fortaleza airport passenger terminal and the roads that lead to the beaches west of the metropolitan region. The proposed program complements PRODETUR by improving the connections of these tourist routes with the metropolitan region and other areas of the state. It also complements the Federal Highway Rehabilitation and Decentralization Program (BR-0195) under study by the Bank, one aim of which would be to transfer a part of the federal system to the states (see paragraph 1.8).
- 1.31 Prior to the earlier operation, the DERT received financial support from the World Bank and Brazil's National Economic and Social Development Bank (BNDES) for rehabilitation of state highways (1982-1988) and tertiary roads (1976-1984), and also from the EXIMBANK/Deutsche Bank for roadbuilding and rehabilitation (1979-1982). The state has also executed important irrigation and watershed-linking projects that will enable a certain degree of regularization in agricultural and agroindustrial production. An agricultural loan is currently being negotiated with the World Bank that will expand rural production and underscores the importance of structuring the paved road system.
- 1.32 Ceará's experience has demonstrated that even a successful highway rehabilitation program is only the first step in the creation of a modern highway administration system; the subsequent administration tasks are much more complex. The actual process of preparing an operation like the one proposed here gives the highway agency an opportunity to assimilate the quantity of procedures and expertise needed for preparing the bidding documents and terms of reference for the studies, services and works required. Moreover, the efficiency of the private sector's performance in the execution of

the services and works will depend greatly on the highway agency's efficiency in the planning, contracting and supervision of said activities.

II. THE PROGRAM

A. Objectives

- 2.1 The purpose of the program is to increase the efficiency of road transportation in the state of Ceará in support of the state's economic and social development. The specific objective is to reduce transportation costs of the state road system.
- 2.2 The program includes actions to: (i) reduce traffic congestion and facilitate the movement of nonmotorized traffic on access roads to metropolitan Fortaleza; (ii) structure the state highway system and rehabilitate or pave its main routes; (iii) link the municipal seats with the state system by means of paved roads; and (iv) set up administrative systems that will make more effective use of resources for road maintenance, while reducing the risk of accidents and protecting the environment.

B. Targets

- 2.3 Upon completion of the program in the year 2001, the economic costs of operating vehicles, in constant values calculated using the HDM-Q model and based on December 1996 traffic composition and costs, will have been reduced to the levels shown in Table II-1, and the portion of the 8,545 km of state highways that is paved will have increased from 4,346 km (49%) to 5,316 km (62%) (see Annex II-1).

Table II-1
Operating cost reduction targets
(in US\$ per vehicle-km)

	Year	Cars	Buses	Trucks
Divided highways	1996	0.32	0.86	0.99
	2001	0.24	0.70	0.71
Paved highways	1996	0.42	1.14	0.99
	2001	0.30	0.93	0.58
Access roads to municipal seats	1996	0.38	0.98	0.86
	2001	0.24	0.73	0.43
Rehabilitated roads	1996	0.27	0.78	0.66
	2001	0.24	0.71	0.48
Asphalt sealing	1996	0.26	0.74	0.57
	2001	0.25	0.73	0.55

C. Formulation of the proposed program

1. Type of operation and project selection criteria

- 2.4 As the proposed operation is a global multiple works program, the projects to be included in the program will have to meet the following criteria.
- 2.5 The divided highway projects in metropolitan Fortaleza are intended to reduce traffic congestion, facilitate access to industrial and tourist centers and help prevent unnecessary movement of heavy vehicles through the city center. The stretches selected are interconnected or they form part of the main access roads into the metropolitan region.
- 2.6 To promote the integration and development of Ceará, the projects selected will have to strengthen road connections among the state's twenty macroregions and Ceará's links with neighboring states. Accordingly, priority will be given to the paving and rehabilitation of highways on four main transportation corridors: (i) route CE-060 in the central region; (ii) route CE-187 in the western region; (iii) routes CE-040 and CE-085 in the northern region; and (iv) routes CE-292/293 in the southern region. By following this approach, the main agricultural and industrial production areas will be integrated with the centers of consumption, and access to the major tourism and fishery areas will be facilitated. The program also includes the paving of roads leading to 16 of the 27 municipal seats in the interior of the state that are not yet linked to the paved system.
- 2.7 In addition to meeting the above-mentioned criteria, the economic, environmental, road safety and engineering studies for projects to be included in the program will be required to demonstrate their technical, economic and environmental feasibility in accordance with the Bank's usual standards and indicators.
- 2.8 The stretches to be paved or rehabilitated were studied using the Highway Design and Maintenance Model (HDM) that is part of the pavement management system set up under the first roads program. The type of work needed was decided by means of a physical evaluation of each stretch, including the volume and composition of the traffic carried.
- 2.9 The projects also have to meet the Bank's standard criteria, on the basis of studies and documents which demonstrate that: (i) alternatives have been analyzed and the solutions proposed are optimal from the technical and economic standpoints; (ii) the economic internal rate of return of the project is equal to or higher than 12%; (iii) the final engineering designs are ready and incorporate appropriate road safety provisions (including for nonmotorized traffic) and environmental protection measures; and (iv) if

resettlement is required, a plan has been drawn up and duly approved by the environmental authorities and by the Bank.

2. Representative sample

- 2.10 The sample includes complete studies of all the roads to be made into divided highways (51.7 km) that lead into metropolitan Fortaleza, since these will require expropriations and resettlement of the people currently living on the land that will be used. The other works do not involve any special problems. The sample includes: (i) 178 km (42% of the program total) of paving on main highways; (ii) 132 km (29%) of low-cost paving on roads leading to municipal seats; (iii) 284 km (56%) of rehabilitation work on paved roads; and (iv) 101 km (29%) of sealing and minor complementary works.

D. Description of the program components

1. Engineering and administration (US\$18.7 million)

a. Advisory services for program management (US\$4.5 million)

- 2.11 To administer and coordinate the program, the DERT will set up a program management unit that will be advised by a consulting firm specialized in the technical, financial and accounting administration of projects with international financing; this firm will be contracted prior to the first disbursement of the prospective loan.

b. Studies and projects (US\$2.8 million)

- 2.12 To conduct studies on stretches eligible for the program that were not included in the representative sample, consulting firms specializing in road projects will be contracted to prepare the technical, economic and environmental studies and engineering designs. The same criteria and methods will be followed as those used for the sample projects (see paragraphs 2.5, 2.6, 2.7 and 2.9).

c. Works supervision (US\$11.4 million)

- 2.13 Technical and administrative supervision of the works will be performed by specialized consulting firms and will comprise: (i) verification of compliance with the technical standards and specifications for each project; (ii) analysis and formulation of recommendations concerning any necessary modifications or adjustments to the designs, construction methods or programming of the works supervised; (iii) certification of the quality of the works and installations and determination of the proper application of the road safety and environmental protection measures specified; and (iv) monthly verification of the progress and price of the works.

2. Road works (US\$163 million)

a. Divided highways leading into Fortaleza (US\$45 million)

- 2.14 The work to create 51.7 km of divided highway will consist of construction of two two-lane roadways separated by a central median, on the same alignment as the present two-lane road carrying two-way traffic. The works will include: (i) shaping of the roadbed to adapt it to the new cross section and to the configuration of the planned intersections; (ii) construction of drains and ditches for controlling surface and ground water; (iii) construction of a bike lane along the entire length of the highway, with pedestrian walkways and crossings where necessary; (iv) installation of signs and road safety devices; and (v) protection of banks and slopes and other environmental measures.
- 2.15 The installation of lighting or the relocation of power, water, sewer, and telephone lines and TV cable systems will not be included in the works contracts. The DERT will coordinate timely execution of such relocation work with the companies concerned and will sign the necessary contracts before the first disbursement for the respective works.

b. Paving of main roads (US\$35.5 million)

- 2.16 Ten projects have been proposed representing a total of approximately 420 km. The works will consist of surfacing with earth or gravel, and earthmoving to adapt the existing roadbed to the new vertical and horizontal alignments, with expansion and complementation of the drainage and other special structures involved. All the projects include installation of signs and special safety devices for pedestrian and nonmotorized traffic, especially at intersections with other roads where the main roads concerned pass through populated areas. The budgets include the cost of remedying past environmental damage and reestablishing plant cover in areas where materials have been extracted, so as to prevent erosion and sedimentation.

c. Paving of municipal access roads (US\$25.5 million)

- 2.17 For 16 rural roads carrying relatively light traffic of 100 to 300 vehicles a day and representing a total length of some 450 km, the intention is to apply low-cost paving, with special drainage works and structures to ensure year-round usability and avoid the cost of periodic replacement of gravel and other materials. There will not be any significant changes of alignment or widths that would entail large-scale earthmoving.

d. Rehabilitation of paved highways (US\$50 million)

- 2.18 These works comprise approximately 510 km that were not included in the first roads project because the proceeds of that loan had already been used up. The works include: (i) strengthening and/or reconstruction of existing asphalt pavement; (ii) rehabilitation or augmenting of surface and underground drainage and special structures; (iii) installation of signs and safety devices at intersections with other roads and in populated areas; and (iv) measures to protect the environment and remedy past environmental problems.

e. Asphalt seal and minor repairs (US\$7 million)

- 2.19 These works involve some 350 km and consist of the application of a bituminous or asphalt coating on the road surface in order to seal cracks, prevent rainwater penetration and contain deterioration of existing pavement, thus deferring the need for full-scale rehabilitation for several years. The works include minor repairs to drains and structures for control of surface water, replacement and augmentation of signs, signals and markings, road safety devices and repair of past environmental damage.

3. Institutional strengthening (US\$5.5 million)

- 2.20 The first program, which was completed in 1996, included training and technical assistance activities that enabled the DERT to improve its planning capacity, set up a pavement management system and computerize a large part of its technical and administrative units. Under the second program, these systems will be refined, and training will be expanded to new specific areas.

a. Reorganization of the DERT (US\$2.1 million)

- 2.21 This study will focus on outlining the new functions of the DERT and simplifying its administrative procedures, with a view to obtaining economies of scale and greater flexibility in the deployment of technical personnel. The intention is to contract a specialized consulting firm, in accordance with preliminary terms of reference agreed between the DERT and the Bank, for the purpose of establishing the arrangements for that integration, designing the new structure and supporting the DERT in implementing the necessary changes in its organization and procedures.

b. Training program (US\$600,000)

- 2.22 The DERT reorganization study will identify specific areas for a training program for its technical and administrative personnel covering aspects of road administration, environmental management, traffic safety, transport engineering, administrative and financial management and auditing.

c. Implementation of the Road Maintenance and Administration System (RMAS) (US\$500,000)

- 2.23 Specialized consultancy services will be contracted to support the DERT in implementing the RMAS designed under the first program. The various methods of performing maintenance will be analyzed and the most efficient combination (force account/by contract) and the best organizational structure for administering maintenance will be determined.

d. Other studies and services (US\$2.3 million)

- 2.24 The program also includes: (i) implementation of 500-meter experimental stretches; (ii) a strategic information technology plan; (iii) a georeferenced information system; and (iv) environmental monitoring measures.

4. Equipment procurement (US\$6.3 million)

- 2.25 Engineering, computer, pavement, evaluation, traffic safety and weighing equipment and instruments will be procured to strengthen the DERT's technical and administrative capacity and improve control of road traffic. The road maintenance equipment will be used for: (i) rapid response in emergency situations and preventing traffic disruptions; and (ii) performing maintenance work which cannot be contracted out because of its sporadic nature, dispersal over a large area and difficult access.

5. Associated costs (US\$15.25 million)

a. Expropriation of land and buildings (US\$13.5 million)

- 2.26 In order to make access roads into metropolitan Fortaleza into divided highways, it will be necessary to widen the right-of-way strip by expropriating adjoining land and compensating the owners for any property affected. The areas to be expropriated have been defined in the engineering studies and the value of the land, buildings and installations affected has been estimated at market prices.

b. Resettlement of families (US\$1 million)

- 2.27 A total of 226 low-income families have been identified who will have to be relocated under an agreement with the Ceará State Housing Authority (COHAB) (see paragraphs 3.18 to 3.20).

c. Weigh stations and inspections (US\$750,000)

- 2.28 To step up vehicle weight inspections for interstate and intrastate freight, five posts will be remodeled and a new one will be built, and equipped with scales procured with program funds. The posts on roads under state jurisdiction will be the responsibility of the

Highway Police and the Finance Secretariat, while the scales on federal highways will be operated by private firms contracted by the DNER, under agreement with the DERT.

6. Total cost of the program and financing

- 2.29 The total cost of the proposed program is US\$230 million, of which the Bank will finance up to US\$115 million (50%) with funds from its ordinary capital and the remaining 50% will be covered by funds contributed by the Government of the State of Ceará.
- 2.30 The Bank loan will be granted on the following conditions: (i) amortization period: 20 years; (ii) disbursement period: 4 years; (iii) interest rate: variable, on amounts disbursed; (iv) credit fee: 0.75% p.a. on undisbursed balances; (v) Bank inspection and supervision: 1% of the loan amount; and (vi) currency: United States dollar.
- 2.31 Table II-2 presents the various investment categories and their principal components, with a breakdown of the contributions from the Bank and the State of Ceará.

Table II-2
Estimated cost of the program
(US\$000s)

Components	IDB	Local	Total	(%)
1. Engineering and administration	5,700	13,000	18,700	8.1
1.1 Advisory services for program management	—	4,500	4,500	
1.2 Studies and projects	—	2,800	2,800	
1.3 Works supervision	5,700	5,700	11,400	
2. Civil works	104,700	58,300	163,000	70.9
2.1 Divided access highways into Fortaleza	27,000	18,000	45,000	
2.2 Paving of main roads	24,850	10,650	35,500	
2.3 Paving of access roads to municipal seats	17,850	7,650	25,500	
2.4 Rehabilitation of paved highways	35,000	15,000	50,000	
2.5 Asphalt seal and minor repairs	—	7,000	7,000	
3. Institutional strengthening	2,200	3,300	5,500	2.4
3.1 Reorganization of the DERT	1,050	1,050	2,100	
3.2 Training program	450	150	600	
3.3 Maintenance admin. system	250	250	500	
3.4 Other activities	450	1,850	2,300	
4. Equipment procurement	1,250	5,050	6,300	2.7
4.1 Engineering and traffic control equipment	1,250	1,550	2,800	
4.2 Road maintenance equipment	—	3,500	3,500	
5. Associated costs	—	15,250	15,250	6.6
5.1 Land purchase for right-of-way	—	13,500	13,500	
5.2 Relocation of displaced families	—	1,000	1,000	
5.3 Upgrading of inspection posts	—	750	750	
6. Finance charges	1,150	20,100	21,250	9.2
6.1 Interest	—	18,900	18,900	
6.2 Credit fee	—	1,200	1,200	
6.3 Bank supervision	1,150	—	1,150	
Total	115,000	115,000	230,000	100.0
Percentages	50	50	100	

III. PROGRAM IMPLEMENTATION

A. Executing agency

- 3.1 The executing agency for the program will be the Departamento de Edificações, Rodovias e Transportes [Department of Buildings, Highways and Transportation] (DERT), an agency attached to the Secretariat of Transportation, Energy, Communications and Works of the State of Ceará (SETECO).
- 3.2 For the monitoring and administration of all the activities involved in the proposed program, an implementation and administration system will be used that is similar to the one employed in the first highway program and which produced satisfactory results. Accordingly, the DERT will utilize its own institutional structure and will set up a Project Management Unit (PMU) that will report to the agency's superintendency. The PMU will be advised and supported by a specialized consulting firm. Formal establishment of the PMU (condition already fulfilled), assignment of the personnel who will staff it and contracting of the consulting firm will be conditions precedent to the first disbursement from the Bank financing.
- 3.3 All program works will be executed by private construction firms. The supervision of these works, together with the preparation of the pertinent studies and provision of technical assistance services, will be performed by specialized consulting firms or independent consultants, as appropriate, who will be contracted by the DERT in accordance with procedures agreed upon with the Bank. Administration of these contracts and inspection of the services will be the responsibility of the DERT. The agency's capacity and experience, with the support referred to in paragraph 3.2, are considered sufficient for it to perform this function.
- 3.4 The execution of certain components and/or the utilization of certain equipment procured with program funds will be entrusted to other specialized institutions that have no formal reporting relationships with the DERT. Accordingly, the agency will need to conclude the necessary agreements for delegating responsibilities or transferring resources, as appropriate. The suitability and operating capacity of these institutions have been examined by the project team and are compatible with the Bank's requirements.

B. Status of preparation of the program

- 3.5 The technical, economic and environmental feasibility studies and the basic designs and tender documents for 22 projects, covering approximately 750 km of roads, are ready and have been evaluated and found satisfactory by the project team; of these, approximately 650 km would form the groups of projects for which contracts would

be awarded in the first year (see paragraph 2.10). Contracts have already been signed as well for studies and designs for an additional 530 km, so an adequate flow of projects is assured for the next few years.

- 3.6 The DERT has submitted the environmental impact assessment (EIA) for the works involved in making access roads to metropolitan Fortaleza into divided highways, together with the plan for compensating and resettling the people affected by these works. It has also submitted the EIA for the other paving, rehabilitation and sealing works included in the proposed operation. All these documents were made available to the public on March 17, 1997, in compliance with the Bank's public information policy.
- 3.7 The institutional strengthening and equipment procurement components have been defined, together with the compensation and resettlement needs of the affected persons. Most of the terms of reference have been prepared for these components, and drafts of the agreements that the DERT would sign with other agencies for executing one or more of these components, and/or receiving in transfer, equipment for traffic safety, control of hazardous loads, etc., have been submitted to the project team.
- 3.8 The project team has given its clearance for publication of the General Procurement Notice for the program and has approved the text of the specific notice that would be published for letting contracts to convert Fortaleza's access roads into divided highways. The project team has also reviewed and approved the model bidding documents that would be used in the international competitive bidding on the works involved in the proposed operation.

C. Execution of the program components

1. Advisory services for the PMU

- 3.9 To advise the PMU in the technical, environmental and financial control of the program, a specialized consulting firm would be hired for the entire program execution period. This firm will have to be selected sufficiently in advance so that it can be in place before the disbursements for the other program components are started (see paragraph 3.2).

2. Studies and projects

- 3.10 This component comprises the execution of studies for the paving, rehabilitation and asphalt sealing of approximately 600 km of highways which, when combined with the projects covered by the program's representative sample and others already contracted by the DERT and currently under way (see paragraphs 2.10 and 3.5), give a program total of 1,780 km to be improved. These studies are to be contracted for as a package, so that all the technical,

economic, environmental and road safety aspects can be handled in a coordinated fashion under the responsibility of a single firm or consortium. The review and approval process for these studies will be precisely the same as for the evaluation of the sample evaluated by the Bank.

3. Works supervision

- 3.11 The consulting firms that will supervise the divided highway, paving and rehabilitation works will have to be contracted sufficiently in advance for them to be able to start their services no later than one month before the commencement of the works they will be supervising. The asphalt sealing works will be supervised by technical personnel from the DERT resident engineers' offices.

4. Civil works

- 3.12 All the works included in the program will be contracted out to private construction firms; tenders will be grouped by geographic location so as to achieve economies of scale, and combined into lots or packages that will make them attractive for international competition. In programming the tender processes, priority will be given to rehabilitation and asphalt sealing, in order to prevent further deterioration of the roads concerned.
- 3.13 Before giving the order to start work on the divided highways component, or any other projects that run through built-up areas, the DERT shall submit evidence to the Bank that the utility companies whose systems and installations might interfere with such work possess the resources and action plans to carry out the necessary relocations without disruption of their normal services. To this end, the DERT will conclude the pertinent agreements in good time with the Ceará Electricity Company (COELCE), the Brazilian Telephone Company (TELEBRÁS), the Ceará Water and Sewerage Company (CAGESE), and such other utility companies as may be necessary.
- 3.14 In all works where the right-of-way will have to be widened onto private lands or property, the DERT will be required to submit the plans for compensating and resettling the low-income population affected before calling for bids on these works.

5. Institutional strengthening activities

- 3.15 The majority of the training courses and system implementation work included under this heading will be contracted out to consulting firms or individual consultants with extensive experience in the specialized areas concerned. In each case, the DERT and the Bank will agree on the content of the programs, the scope and terms of reference for the services to be contracted, as well as the consultant selection procedures. For some of the subcomponents, e.g. the experimental road sections and the establishment of the

georeferenced information system, specific agreements will be signed with public or private organizations possessing specialized capacity and equipment.

6. Equipment procurement

- 3.16 The equipment to be procured with program funds will be installed at the DERT's main offices or other DERT premises and will be used by DERT personnel, except for traffic safety and vehicle weighing equipment. The former will be transferred to the Highway Police and the Fire Department under ad hoc agreements. The operation of the scales and other control equipment on state roads could be turned over to private firms under contract, while on federal roads an agreement with the DNER would be required (see paragraph 2.28).

7. Land acquisition for right-of-way widening

- 3.17 It is expected that the bulk of the works making up the program will be executed within the right-of-way strip owned by the DERT. However, in the case of the divided highways to be constructed on the routes leading into Fortaleza, it will be necessary to widen this strip, expropriate land, demolish buildings and resettle low-income families. Under Bank policy, in all works to be fully or partially financed with Bank funds where land, buildings or facilities owned by third parties are involved, the borrower is required to produce evidence to the effect that it has reached agreement with the owners on the payment or compensation they will receive for the property affected, or else that it has been assigned such property, before the Bank will authorize calling for bids on the respective project (see paragraph 2.26). In Brazil, the land acquisition system for rights-of-way permits the highway agency to take immediate possession of the land required, even though the expropriation procedures may not yet have been completed.

8. Resettlement plan for low-income families

- 3.18 In order to build the divided highways into Fortaleza, it will be necessary to move people who are currently illegally occupying the right-of-way and to expropriate some additional land (see paragraphs 2.26 and 3.14). Specifically, 360 families (1,851 persons) occupying 315 residential buildings, and 78 commercial enterprises currently operating in 55 buildings will be relocated. In addition, 11 industrial facilities and 7 schools and health clinics will be partially affected.
- 3.19 Of the families affected, 226 are in the low-income category. The DERT has prepared the respective resettlement and compensation plan which has been reviewed and approved by the Bank. This plan covers 100% of the divided highway works, which are the only ones for which families will be displaced. To implement this plan, the DERT will sign an agreement with COHAB, the agency responsible for

implementing housing policy in Ceará. COHAB's performance in previous Bank-financed projects was satisfactory. The draft version of the agreement has been reviewed and approved by the Bank, and finalization of the agreement will be a condition precedent to the first disbursement.

- 3.20 The objective of the plan is to compensate the low-income population affected by the works and improve their living conditions. The plan offers differentiated compensation options for the various groups involved, thus enabling families: (i) to select the actions that will be adopted to assist them; (ii) to organize themselves into associations to track the implementation of the plan; (iii) to integrate themselves into their new community; (iv) to minimize displacement; (v) to develop activities and associative structures based on existing social organizations; and (vi) to pay special attention to the organizational potential of women and their capacity for managing productive and social projects.

9. Upgrading of inspection posts

- 3.21 Construction of the weigh stations (see paragraph 2.28) will be performed by the DERT's Construction Unit.

D. Execution schedule

- 3.22 The program will be implemented over a four-year period from the effective date of the prospective loan contract. Physical commencement of all works is to take place before the end of the third year of program execution.

E. Bidding on works, procurement of goods and contracting of services

- 3.23 Before inviting bids on any of the works included in the program, the executing agency shall submit evidence to the Bank that it has obtained the approvals and environmental permits required by national legislation and the Secretariat for Environmental Affairs of the State of Ceará (SEMACE).
- 3.24 Brazil has three types of environmental permits: (i) the preliminary permit, which authorizes the bidder to contract basic designs and working drawings, is required during the preparation of the project, and its granting is normally tied to approval of an environmental impact assessment (EIA) and of the summary assessment intended for public use (RIMA); (ii) the works permit is granted after approval of the working drawings and the mitigating measures set out in the EIA/RIMA; it serves to notify the executing agency of all environmental requirements it will have to comply with during construction of the works and allows it to call for bids and start the works; and (iii) the operating permit, which is issued after verification that the mitigating measures are fully in effect.

- 3.25 The DERT already has the preliminary and works permits for all the sample works under the proposed program.
- 3.26 Before the Bank authorizes bidding on works or the procurement of goods that will be made available to or transferred to any agency that does not report to the DERT, agreements will have to be concluded setting out the obligations assumed by the parties and their commitment to assign the resources necessary for their operation and maintenance (see paragraph 3.16).
- 3.27 The works planned are not of a complex nature and do not require any special technology, so prequalification will not be necessary. However, the way in which the bid packages will be grouped would require bidders to meet specific levels of installed capacity and financial soundness; accordingly, it is recommended that the two-envelope system be used for bidding.
- 3.28 When the value of works or packages of works that are being put out to tender simultaneously and that are to be funded entirely or partially out of the prospective loan exceeds US\$5 million, international competitive bidding will be used. Where the total involved is less than that figure, or when the financing is entirely local, the bidding can be conducted in accordance with the procedures specified by Brazilian legislation.
- 3.29 All goods financed fully or partially with Bank funds for amounts equal to or exceeding US\$350,000 shall be procured by international competitive bidding. For amounts below that figure, procedures shall be used that will ensure unrestricted competition and guarantee the quality of the products and services to be procured, provided there is no conflict with Bank policies.
- 3.30 Contracts for consultancy services funded under the prospective loan for amounts equal to or exceeding US\$200,000 shall be effected by public international call for proposals. For contracts involving smaller amounts, the procedures laid down by local legislation shall be followed. In all cases the bidding documents shall be submitted to the Bank for approval.
- 3.31 The Bank's procedures for the contracting of works, procurement of goods and services, and the contracting of consultants will form part of the prospective loan contract. The proposed schedule of bidding and contracts is shown in Annex III-4.

F. Recognition of expenditures and retroactive financing

- 3.32 The borrower has requested recognition of expenditures incurred in the preparation of this operation which, from the date of its request (March 28, 1997) to the prospective date of approval of the loan, would amount to US\$4 million equivalent. These expenditures relate to the contracting of consultancy services for the preparation of the sample and any initial payments made to the

consultants who will support the PMU, which would be considered as counterpart funding for the program.

G. Reports on maintenance of works, facilities and equipment

- 3.33 Within six months of startup of the works, the DERT shall submit to the Bank the respective maintenance plan for equipment procured or installations financed with loan proceeds, indicating the resources that will be assigned for this purpose, the frequency of maintenance work and the parameters for evaluating its effectiveness. Subsequently, during the rest of the program and up to the tenth year after the date of the last disbursement, the DERT shall prepare an annual report that will be delivered to the Bank in the first quarter of each year and which will contain: (a) the maintenance activities carried out during the previous year; (b) the resources used; (c) a detailed assessment of the condition of program works, facilities and equipment and of other state roads; and (d) the proposed maintenance plan for the following year.

H. Monitoring and control of the operation

- 3.34 The Bank will monitor and control this operation's progress and disbursements on an ongoing basis through its Country Office in Brasilia. This office will receive and evaluate all the borrower's reports, verify the progress of the program and authorize loan disbursements.

I. Ex post evaluation

- 3.35 In accordance with Bank policy, the borrower and executing agency were consulted and they decided not to perform an ex post evaluation as part of the program activities. Nevertheless, the DERT will set up the pavement management system (SGP) database, which, together with the annual reports, will mean that if the Bank wants to make such an evaluation, it will have access to the necessary data for measuring the indicators specified in the logical framework for the program.

IV. THE BORROWER AND THE EXECUTING AGENCY

A. Institutional analysis

1. Borrower, guarantor and executing agency

- 4.1 The borrower will be the State of Ceará, which will also be responsible for the local counterpart funding; the guarantor will be the Federative Republic of Brazil; and the executing agency will be the DERT.

2. Nature and functions

- 4.2 The DERT is a decentralized agency attached to SETECO. Its legal basis is found in State Law 1,847 of October 19, 1946, as amended, including State Decree 22,523 of May 7, 1993, reorganizing its institutional structure.
- 4.3 The functions of the DERT, according to the legislation establishing it, are the planning, coordination, execution and control of activities connected with the state road system, together with implementation of the policies regulating that system.

3. Institutional structure

- 4.4 The DERT's current structure is made up of the following levels:
- a. Decision-making bodies and senior management: Deliberative Council and Superintendency.
 - b. Advisory bodies serving the Superintendency: Office of the Superintendent, Advisory Office for Planning and Coordination (ASPLAN), Legal Affairs Office and Internal Audit Office.
 - c. Technical units: Offices of Works, Buildings, Operations and Transportation, plus 15 Regional Resident Engineer's Offices.
 - d. Administrative unit: Administrative and Finance Department (DEAFIN).
- 4.5 In the ongoing process of eliminating and merging government agencies, the State of Ceará recently combined the SOEC with the DERT. The SOEC had been responsible for public works construction in the state. Combining these two agencies will enable the DERT to perform the two agencies' functions more efficiently; it will be able to distribute staff geographically in a more balanced manner and take advantage of the economies of scale offered by the new structure. In addition, the modernization of the DERT, as discussed below, is also designed to promote efficiency. It should

be noted that if the planned merger does not in fact materialize the proposed program would not be affected, since the present structure of the DERT is adequate for it to perform all its responsibilities as well as those that would derive from this operation. It is also important to confirm here that the DERT successfully executed the first roads program financed by the Bank.

4. Reorganization and modernization

- 4.6 The DERT intends to carry out as part of this program a plan for reorganizing and modernizing its institutional structure; accordingly, one year after the contract with the Bank has been signed, the DERT is to hire a specialized firm to advise it on its new organization and modernization. The amount of this contract is estimated at US\$1.5 million; the preliminary terms of reference have already been agreed upon with the Bank, and the firm is to be hired within 12 months of the signing of the loan contract.

5. Human resources

- 4.7 Matters related to the DERT's staff are handled by its Division of Human Resources, which reports to the Administrative and Finance Department. As noted in chapter I, the DERT reduced its personnel by 44.5% between 1991 and 1996. This was an outcome of the policy to downsize the public sector and contract private sector services, as pursued by the Ceará state government in general, and the DERT in particular.

6. Staff training

- 4.8 Staff training at the DERT is the responsibility of its Staff Development Unit, which comes under the Division of Human Resources. As explained in chapter II, the DERT carried out a training plan that was partially funded under the first roads program. The results of that exercise were satisfactory but insufficient to meet the challenges that the agency will face in the medium term. The DERT will consequently continue to provide training for its staff through a specific component that will be included in the program.
- 4.9 In this context and to maintain the DERT's institutional memory, 15 DERT staff members will be trained in the Program Management Unit (PMU). This training will be done by the consulting firm that will support the PMU, and the objective will be to transfer to them knowledge of the methodologies and procedures used to administer this program. The DERT is to establish legal arrangements that will encourage the employees so trained to remain with the agency for a period that is in keeping with the investment made in their training. Employees deciding to leave at an earlier date will be required to compensate the DERT.

B. Coexecuting agencies

- 4.10 As noted in chapter III, COHAB will be a coexecuting agency for the program. A team will be formed within COHAB that will be responsible for technical and administrative aspects of the program. It was ascertained during the analysis that COHAB carries out its activities satisfactorily and possesses extensive experience in performing functions similar to those it will be required to undertake in the proposed program.

C. Financial analysis

1. Financial administration, preparation and control of budget performance

- 4.11 The DERT's financial resources are administered by the Division of Finance, while control of budget performance is handled by the Budget Division, both of which report to DEAFIN. Financial management falls under the Integrated Financial Administration System, handled by the Finance Secretariat by means of the "single account" mechanism, whereby each public agency functions as a "depository" and makes its respective payments through accounts controlled by the Secretariat. All these activities have an adequate level of execution and control. Nevertheless, to strengthen the divisions involved, within 12 months of the signature of the loan contract with the Bank, the DERT is to place an officer in each Resident Engineer's office who is qualified to maintain strict administrative and financial control.
- 4.12 The DERT's budget is prepared by the various departments and units of the agency, whose proposals are forwarded to ASPLAN for consolidation and transmittal to the Secretariat of Planning of the State of Ceará (SEPLAN), once approved by the Superintendency of the DERT and by SETECO.

2. Internal and external control of the DERT

- 4.13 The Ceará government has set up an internal and external control system for transactions for which the DERT is responsible. The audit activities at state level involve the following: (i) internal audit, done by the DERT Audit Unit, which reports to the DERT Superintendency and needs to be strengthened; and (ii) external audit, which is performed by the Ceará State Secretariats of Finance and Administration, and finally by the State Audit Office, which reports to the State Legislative Assembly. Each of these units acts in its respective field and their work is considered satisfactory. However, to ensure timely delivery of the program's financial statements to the Bank, the audit reports are to be submitted to the Bank with the opinion of a firm of independent public accountants acceptable to the Bank.

- 4.14 The analysis revealed that the DERT's Internal Audit Unit had lost three of its eight auditors, and that this was affecting the scope and quality of the unit's work. To remedy this situation, it has been agreed that the unit will be strengthened as follows: (a) it will be provided with the necessary equipment; (b) its personnel will receive training; and (c) twelve months after signature of the loan contract with the Bank, the DERT will have reorganized the unit's administrative structure to allow it to respond to the agency's needs. Table IV-1 shows the net budget performance of the State of Ceará for the period 1992-1996.

Table IV-1
Ceará net budget performance 1992-1996
(US\$ millions)

	1992	1993	1994	1995	1996
Revenue					
Total current revenue	854.0	1,070.3	1,280.4	1,624.3	1,853.5
Total capital revenue	54.2	171.1	121.8	172.2	132.3
Total revenue	908.2	1,241.4	1,402.2	1,796.5	1,985.8
Expenditures					
Current expenditures	604.4	817.5	962.8	1,408.8	1,577.4
Capital expenditures	297.0	399.1	405.9	445.2	372.5
Total expenditures	901.4	1,216.6	1,368.7	1,854.0	1,949.9
Current balance	249.6	252.8	317.6	215.5	276.1
Total balance	6.8	24.8	33.5	(57.5)	35.9

Source: State budget performance balance sheets prepared by the Finance Secretariat.

Net budget: Total budget less transfers to municipalities. Annual average exchange rate published by the Central Bank of Brazil.

- 4.15 The data in Table IV-1 show that during the period analyzed the State of Ceará obtained average total revenues of US\$1,467 billion per year, with sustained annual growth in collections of 22%. Expenditures posted similar behavior, with growth comparable to that on the revenue side, especially as of 1995. The increases in expenditures were due to a salary increase for state employees in that year. That salary increase generated a small deficit in the state's accounts in 1995, equivalent to 3.2% of total revenues. This situation was reversed in 1996, when the state again posted a fiscal surplus as it had in the years up to 1994.
- 4.16 The main observation to be made on the revenue side is the sustained growth in current revenue. This is due to the significant increase in turnover tax (ICMS) collections, which rose from US\$368 million in 1993 to US\$880 million in 1996. The other item posting a large increase was current transfers from the federal government, up from US\$425 million in 1993 to US\$796 million in 1996. These increases can be attributed to the success of the "Real Plan", which stabilized the economy and

enabled the federal government to increase its collections and thus its transfers to the states. Economic stabilization also contributed to sustained growth in Ceará's real GDP at rates averaging 5% p.a. in the last three years of the period considered. The state also strengthened its tax administration, which enabled it to cut down on tax evasion.

- 4.17 The main observation to be made on the expenditure side has to do with current expenditures, especially payroll and current and intragovernmental transfers. The three items were affected by the implementation of the Careers and Positions Plan, which reevaluated positions and adjusted salaries. The adjustment covered retired and inactive employees as well, which was reflected in the increase posted in the three accounts mentioned, especially the latter two. Nevertheless, the state's personnel expenditure was maintained at an average of 55% of net revenue over the period 1993-1996, below the 60% ceiling set by federal law. That policy helped Ceará to run a current-account surplus throughout the period examined. Furthermore, the state honored its commitments to its internal and external creditors at all times, in accordance with a ruling of the state authorities designed to maintain the state's good image. Its debt as of December 31, 1996, stood at US\$2 billion, of which only US\$324.3 million was external.
- 4.18 The DERT's income is derived from the transfers it receives from the State of Ceará. Its budget performance during the period 1993-1996 shows a balanced financial position, with significant growth in current revenue and expenditures as of 1995. This growth resulted from the effects of the implementation of the Careers and Positions Plan referred to above, which obliged the state to increase transfers for personnel remuneration. It should be noted that notwithstanding the higher wage bill, the DERT's average annual expenditure on personnel over the period 1993-1996 represented no more than 29.7% of its revenues. In addition, the austerity approach adopted and the commitment of funds in accordance with the previously approved budget enabled the DERT to maintain a position of financial equilibrium during the period. The small deficit posted in 1996 was more of a bookkeeping type deriving from the "commitments payable" item, which itself resulted from commitments entered into at the end of December 1996 that were then paid at the beginning of 1997.
- 4.19 During 1996 the DERT received transfers from the state treasury for capital expenditure purposes amounting to US\$20 million equivalent. A significant increase in this amount is expected in coming years, and is underscored by the fact that the Ceará legislative assembly approved the equivalent of US\$52.5 million in the state budget for 1997, US\$25 million of which is earmarked for the local counterpart funding for the proposed program.

3. Transfers to COHAB

- 4.20 The funds to enable COHAB to execute the program components described in chapter II will be transferred to it by the state through the DERT, in accordance with the agreement to be concluded between the parties. The estimated amount for these purposes is reasonable, but the DERT has been advised to ensure that a clause covering financial adjustments is included in the agreement.
- 4.21 The revenue generated by Ceará's transportation sector in 1996 was almost three times that of 1993. The reasons for this were basically three in number: (a) increase in the number of vehicles on the roads; (b) updating of vehicle prices in accordance with their market value; and (c) review of the table used as a basis for computing the vehicle property tax.
- 4.22 Brazilian law does not require authorities at any level (federal, state or municipal) to use resources generated by the transportation sector in that sector. However, comparison of the DERT's budget performance with the revenue generated by Ceará's transportation sector shows that the amount invested by the state in the road transportation subsector during the period 1993-1996 averaged US\$40 million per year, while the revenue generated by the transportation sector during the same period was US\$95 million. The latter figure, over 90% of which was collected from the road transportation subsector, is more than double the amount that was invested in the subsector.

V. PROGRAM VIABILITY

A. Technical feasibility

- 5.1 The studies for the projects forming the program sample were made using evaluation, calculation and dimensioning criteria and methodologies compatible with modern practices and internationally accepted engineering standards. Reliable, recent basic data concerning traffic and the characteristics and condition of existing roads were used in adopting the main design parameters for the proposed works.
- 5.2 The unit prices used for determining the costs of the sample projects were obtained from the DERT's system, which is updated periodically in accordance with variations in labor rates and the prices of materials and equipment. The average costs for this type of work fall within a range compatible with the results of similar contracts recently concluded by the DERT.
- 5.3 In general, the proposed works do not involve complicated construction work, but particular attention will have to be paid to the execution of the works to be carried out in urban areas, both to ensure that the right-of-way will be available in a timely fashion, and to provide for the relocation of public utility facilities, set up traffic detours and implement the safety and environmental control measures needed to prevent accidents and excessive nuisances for drivers and the people living in the vicinity.
- 5.4 The program includes training activities in technical areas and systems implementation, and calls for engineering equipment to be procured in the early months of the program so that it can be put to use promptly in the execution of the program. One of the innovative features is the use of nonconventional materials in the paving of certain experimental stretches. If the results obtained prove satisfactory, use of these materials on a larger scale could result in lower costs for future paving work and/or lower maintenance costs; if the expected results are not obtained, repaving of the experimental stretches would not impose additional costs affecting the program's viability.

B. Institutional feasibility

- 5.5 The program will be executed by the DERT, which gained experience in the execution of such works in the first roads program. The other agency involved is COHAB, which also has sufficient experience in the execution of activities similar to those it will have to undertake in this program. COHAB has also demonstrated that it possesses the capacity and experience to do what will be required of it; it has carried out family resettlement programs

without any problems and is currently executing five programs on schedule and without problems, including the respective component of the Bank-funded Fortaleza Sanitation Program (BR-0186).

- 5.6 To ensure successful coordination and control of all the activities to be carried out by the agencies that will participate in the program, the DERT will set up the Program Management Unit, while COHAB will set up a program administration team. This team was evaluated by the Bank and found to be satisfactory. On the basis of the foregoing and of the measures that will be adopted by the DERT and the other agencies involved, the institutional arrangements set up for this operation are felt to adequately meet the Bank's requirements.

C. Financial feasibility

- 5.7 The local counterpart funding to be provided out of the State of Ceará's own resources amounts to US\$115 million. This figure represents only 1% of the state's projected current revenues for the program execution period. The proposed operation is the most important transportation project that the State of Ceará intends to execute in the next four years, so it has assigned it the highest priority.
- 5.8 The State of Ceará's financial projections for the next five years show that the state's own resources will be sufficient to cover its current and operating expenditures, meet debt service, contribute to the financing of the proposed program, and generate a surplus for funding the rest of the investment program under execution and planned.
- 5.9 The analysis of the state's finances and those of the DERT presented in chapter IV and the data given in the preceding paragraph show that the State of Ceará has the financial capacity to meet its obligations. There is accordingly no reason for concern about timely availability of funds to meet the program commitments.

D. Economic feasibility

1. Size of sample

- 5.10 A sample has been evaluated representing US\$112 million (69%) of the total US\$163 million for investment in road works, subdivided by category of works according to the breakdown given in paragraph 2.10.

2. Costs and benefits

- 5.11 The total economic costs of each project in the sample were calculated, including, in addition to paving, the environmental and road safety improvements which form an integral part of each

engineering project and, in the case of divided highways, the costs of expropriation, resettlement and the construction of sidewalks and bike lanes.

- 5.12 The benefits include lower vehicle operating costs, shorter travel times for car drivers and passengers and bus passengers (taking 30% of their hourly remuneration for trips for work, business and services and 0% for other purposes) and fewer accidents. The benefits from improved nonmotorized transportation were not considered, despite the fact that the costs of building sidewalks and bike lanes were included. If these benefits were taken into account, they would have the effect of raising the rates of return for the divided highways.
- 5.13 Traffic growth rates were calculated per stretch and per vehicle category, with the growth in total number of vehicles being less than 3% per year in all sections of the sample.

3. Results of the economic analysis

- 5.14 The Highway Design and Maintenance Model, Version Q (HDM-Q) was used for the economic analysis, which includes the congestion-lessening effects of improvements where applicable, as in the case of the divided highways. Table V-1 summarizes the economic analysis of the sample by investment category. The lowest economic internal rate of return (EIRR) is 17.9% for the conventional paving category, which is quite acceptable. The other rates are high: 41.5% for the divided highways projects; 28.6% for the access roads to municipal seats; and 49.4% for rehabilitation works. All the net present values (NPVs) are positive, ranging from US\$4.4 million for the sealing works to US\$155 million for the divided highways projects.
- 5.15 The highest NPVs correspond to the categories which have both the highest EIRRs and the largest investments, with NPVs of US\$155 million for the divided highways projects and US\$100 million for rehabilitation works, while the NPVs of the lower-cost components are US\$5.3 million for conventional paving, US\$7 million for paving of access roads to municipal seats, and US\$4.4 million for sealing.

Table V-1
Results of the economic analysis

	Investment(*) (US\$ millions)	% of component	EIRR (%)	NPV (US\$ millions 12% p.a.)
Divided highway	60.0	100.0	41.5	155.2
Conventional paving	15.0	42.2	17.9	5.3
Access to municipal seats	7.3	29.4	28.6	7.0
Rehabilitation	27.7	56.0	49.4	99.5
Sealing	2.1	28.8	28.2	4.4

(*) Including taxes.

- 5.16 The economic return indicators are acceptable in all sections of the sample. The great majority of the sections present very high EIRRs, indicating that road investments in Ceará are well below what would be economically desirable (even after the proposed program, 38% of the roads under the state's jurisdiction will still be earth or gravel surfaced).
- 5.17 Economic feasibility was supported under all simulated hypotheses for the sample sections, except for two municipal access roads under adverse scenarios. Even in these cases, the return remained very close to 12%. These results are considered acceptable, bearing in mind that positive factors were omitted in the calculation of the benefits, such as the fact that, after paving, traffic would not be disrupted during rainy periods, and the secondary economic effects on the local economies.

4. Impact on poverty

- 5.18 The program will benefit practically all residents of the State of Ceará. Seventy-six percent of the state's population is classified as low-income, earning less than the Bank-calculated monthly income threshold of US\$111 per capita in current 1996 values. However, in Ceará as in other parts of Latin America, the poor travel less than the nonpoor, both on intercity buses and in cars, and consume relatively less of the products hauled by trucks. The direct benefits for low-income groups will be limited to the 50 kilometers of bike lanes along the divided highways in metropolitan Fortaleza.
- 5.19 Projects that support labor-intensive economic activities, especially in the export sector, are essential for generating employment and benefiting low-income groups, although it is hard to quantify these benefits in a reliable fashion. The program works will facilitate the development of agriculture, industry, services and tourism, thereby contributing to that end.
- 5.20 Taking this information into account and in accordance with the Eighth Replenishment document (AB-1704), it has been determined that the proposed program meets the criteria of a program

geographically targeting the poor sectors, but does not specifically target the participation of women.

E. Social and environmental feasibility

- 5.21 This program will have a significant positive impact, especially given its synergy with other programs and projects under the state's sustainable development plan. The road works will have localized, foreseeable negative impacts, which will be of low to medium intensity and can be mitigated. The involuntary resettlement of the low-income population, which constitutes the most significant impact, has been adequately prepared in the resettlement and compensation plan (see paragraphs 3.18 to 3.20).
- 5.22 The bike lanes along the roads that will be made into divided highways meet modern project criteria and will have a very positive environmental impact, considering the importance of bicycles for low-income residents in the southwest and southeast sections of metropolitan Fortaleza. The environmental programs proposed in the environmental impact studies (EIAs and RAAs), as approved by the agency that grants environmental permits, consider such issues as the transportation of hazardous materials (and dealing with accidents involving such loads), the introduction into the urban environment of the roads that will be made into divided highways, the review of the design and execution standards for road works and remedying environmental damage. They represent a significant advance in the state's consideration of environmental dimensions in projects and in implementation, works supervision and highway operation. The environmental requirements contained in the bidding documents include all the measures recommended in the environmental impact studies, and the payment schedule requires contractors to execute them promptly and properly.
- 5.23 Consideration is also given to institutional mechanisms for adequate implementation of the various environmental programs proposed and for adequate environmental management of the program. The social and environmental measures have been duly detailed and budgeted, the funds for their execution have been included in the program budget and the execution schedule for them is compatible with the works schedule. Terms of reference have been drafted for the complementary studies and projects recommended, and have been reviewed and approved by the Bank.
- 5.24 The actions to strengthen the DERT's environmental capacity and review its engineering design standards, together with the specifications for the execution of the works, will make it possible to address environmental issues on an ongoing basis during the various phases of the road works in Ceará.
- 5.25 The paving, rehabilitation and sealing works that were not included in the program sample could conceivably present other types of environmental problems, especially where fragile and/or protected

ecosystems are concerned. The program accordingly provides for environmental evaluation and control procedures to ensure compliance with the Bank's requirements regarding eligibility and construction projects.

- 5.26 The program as a whole is felt to be socially and environmentally advantageous and of significant importance for the State of Ceará. It can serve as a model for similar programs in other Brazilian states or other countries in Latin America. The social and environmental report was approved and classified in Category III by the Committee on the Environment and Social Impact at its meeting of May 2, 1997, and forwarded to the Public Information Center on May 12.

1. Environmental recommendations

- 5.27 The loan contract will include the following clauses:

- a. Prior to the first disbursement, the executing agency shall submit evidence to the Bank that it has signed the agreement with COHAB.
- b. Within the six months following the signing of the contract, the DERT shall submit to the Bank the final versions of: (i) the projects relating to introduction into the urban environment, replanting and landscaping for the roads that will be made into divided highways; and (ii) the study on plant species that will be selected for replanting of works-impacted areas. The agreement with the State Secretariat for Environmental Affairs (SEMACE) on the regulation of environmental protection areas in the service area of roads that are to be made into divided highways shall also be submitted.
- c. Twelve months after the signing of the contract, the DERT shall submit the study on the prevention of accidents involving hazardous materials and evidence of: (i) creation of a permanent environmental unit within the organizational structure of the DERT; (ii) organization of a training course in environmental evaluation of road projects and in environmental management and handling of hazardous loads on highways; (iii) preparation of design standards and review of construction standards for highways, to include aspects relating to environmental protection and road safety; (iv) complementary projects to bring existing divided highways, namely CE-040, CE-060 and CE-065, up to the standards of those that will be constructed under the program; (v) signature of an agreement with the agencies involved in the lines of action for hazardous materials; and (vi) that the resettlement and compensation plan for the affected population, and the projects for introducing the roads into urban areas, replanting, and

landscaping of the stretches to be converted into divided highways have been fully implemented.

- d. Twenty-four months after the signing of the contract, the DERT shall submit evidence to the Bank to the effect that: (i) the DERT has analyzed the study on the prevention of accidents involving hazardous materials and has prepared lines of action for the handling and control of such loads in the short and medium term; (ii) the research on and assessment of environmental problems in the paved highway system under the state's jurisdiction have been carried out; (iii) the complementary projects to make the existing divided highways compatible with those to be constructed during the program have been implemented; and (iv) all the environmental measures in the environmental impact studies (EIAs and RAAs) approved by the agency that grants environmental permits and/or any other measures required by that agency have been implemented.
- e. The DERT shall ensure that the bidding documents for possible highway concessions to the private sector during the life of the prospective loan include: (i) an inventory of environmental problems associated with the highway and definition of responsibility for addressing those problems; (ii) clauses that guarantee implementation of environmental protection measures; and (iii) clauses that guarantee access, for at least one year, to the highways, and/or the construction of side roads for channeling traffic and providing access to the highway at an appropriate place, in accordance with the provisions laid down in the highways' operating plans that are to be prepared before bids are invited on the concession.
- f. Quarterly monitoring reports are to be prepared on the resettlement and compensation plan during its execution period, including the results of its implementation, as well as any problems encountered and the steps taken to resolve them.

F. Risks

- 5.28 The rehabilitation projects are based on a November 1996 evaluation of road conditions and cover the deterioration that could occur in a maximum of two years, with routine maintenance being done. If the works are not started within this time frame, it might be necessary to vary the methods for strengthening the existing pavement, with a consequent increase in cost.

**LOGICAL FRAMEWORK
STATE OF CEARÁ SECOND ROADS PROGRAM**

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	MAIN ASSUMPTIONS
<p>road sector, with modern and road administration.</p> <p>operating costs and fewer state roads.</p>	<p>(*)</p> <p>A. By June 2001, the economic costs of vehicle operation as measured in constant per veh-km values by the HDM-Q model are to have been lowered (vis-à-vis December 1996 figures and the situation without the program) for cars, buses and trucks, respectively, as follows:</p> <ol style="list-style-type: none"> 1. divided highways (±52 km), from US\$0.32, 0.86 and 0.99 to US\$0.24, 0.70 and 0.71; 2. conventional pavement (±420 km), from US\$0.42, 1.14 and 0.99 to US\$0.30, 0.93 and 0.58; 3. municipal accesses (±450 km), from US\$0.38, 0.98 and 0.86 to US\$0.24, 0.73 and 0.43; 4. rehabilitation work (±530 km), from US\$0.27, 0.78 and 0.66 to US\$0.24, 0.71 and 0.48; and 5. sealing work (±390 km), from US\$0.26, 0.74 and 0.57 to US\$0.25, 0.73 and 0.55. <p>(*)</p> <p>B. By June 2001, the number of fatal accidents on divided highways are to be down by 65% in relation to traffic volume; in 1996 there were 226 such accidents and the average annual daily traffic was 71,320 vehicles (total for all stretches to be upgraded under the program).</p>	<p>1-5 New HDM runs for each type of vehicle and the program roads in each category, keeping prices and traffic levels and composition constant (DERT parameters management section).</p> <p>These figures reflect the situation upon completion of the works and will be adjusted for the number of years elapsed between completion and the evaluation.</p> <p>B. Accident statistics from DETRAN/CE and traffic volumes and composition from the DERT.</p>	<p>1-5 No macroeconomic changes of magnitude to adversely affect operations of transportation co</p> <p>1-5 Road maintenance will be the better than at present.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	MAIN ASSUMPTIONS
<p>T</p> <p>road system)</p> <p>highways in operation</p> <p>roads in operation</p> <p>ated roads in operation</p> <p>roads in operation</p> <p>and institutional system)</p> <p>nt procured, delivered and in in the following sectors (see list):</p> <p>ement management</p> <p>quarters and resident</p> <p>neer offices</p> <p>c safety</p> <p>pection stations built and</p> <p>rganizational and operating improved.</p>	<ol style="list-style-type: none"> 1. By June 2001, ±52 km of roads divided and open to traffic in the Fortaleza metropolitan region. 2. By June 2001, ±420 km of roads open and paved with conventional material and ±450 km with low-cost asphalt paving. 3. By June 2001, ±530 km of roads rehabilitated and open to traffic. 4. By June 2001, ±350 km of roads with asphalt seal applied and open to traffic. 5. By June 2001, the equipment listed in the annex is to have been received and be in operation, the specifications and warranties checked, and training completed. 6. By June 2001, one new station is to have been built and 6 existing ones rehabilitated and expanded, and will be in operation with their scales, yards and accommodations for Highway Police and Finance Secretariat personnel and scale operators. 7. By December 1999, the measures recommended during the respective technical assistance are to have been implemented, procedures simplified, and personnel trained and assigned to the appropriate sectors. 	<p>Acceptance terms for the works by the DERT and opening of the roads.</p> <p>Acceptance terms for the works by the DERT and opening of the roads.</p> <p>Acceptance terms for the works by the DERT and opening of the roads.</p> <p>Acceptance terms for the works by the DERT and opening of the roads.</p> <p>5. Technical report of the DERT Acceptance Committee</p> <p>6. Acceptance terms for the civil works and the technical report issued by the DERT Acceptance Committee.</p> <p>7. DERT Deliberative Board acceptance of final report prepared by the consultants and forwarded to the Board after review and approval by the committee supervising the consultants' work.</p>	<p>(para 1-9)</p> <ol style="list-style-type: none"> a. Counterpart funding available required. b. No delays in contracting studies unwarranted protests. c. No significant change of an in nature that will prejudice the implementation or efficacy of components.

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	MAIN ASSUMPTIONS
<p>l trained in: onmental management c safety (engineering projects) ral (see attached list)</p> <p>ental monitoring ted.</p> <p>cient methods identified and ted for road safety education aigns</p>	<p>8. By June 2001, training of the new professionals, administrators and middle-management technical staff shown in the detailed is to will have been completed.</p> <p>9. By October 1997, the monitoring arrangements specified in the agreed terms of reference are to be in effect, and will continue in operation on a permanent basis.</p> <p>10. By December 1998, the new methods identified during the technical assistance and agreed to by DETRAN, DERT and the IDB are to have been implemented.</p>	<p>8. Accounting records of UCP/DERT.</p> <p>9. The DERT's quarterly report.</p> <p>10. Consultant's reports, and minutes of DERT and DETRAN meetings.</p>	
<p>ents 1-4)</p> <p>he projects not included in the nd the terms of reference for ervention.</p> <p>bidding documents for the d supervision services.</p> <p>bidding documents, analyze s and select firms.</p> <p>orks and supervision contracts.</p>	<p>See detailed budget and schedule for the program.</p>		<p>1. Confirmation of the project's te economic and environmental v</p> <p>For the components with the numb indicated:</p> <p>1-10 Counterpart funding will be av when required.</p> <p>1-10 No unwarranted protests or ch the pertinent legislation that ca excessive delays.</p> <p>3-4 Rehabilitation works are execu accordance with the schedule updating of engineering desig required.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	MAIN ASSUMPTIONS
<p>ents 5-10)</p> <p>terms of reference for the consultancies and training</p> <p>respective bidding documents.</p> <p>bidding documents, analyze s and select firms.</p> <p>consultancy contracts for studies ing.</p> <p>l assistance in:</p> <p>tenance Admin. Service</p> <p>perimental stretches</p> <p>. Computerization Plan</p> <p>graphic Information System</p> <p>re projects prepared if eligible ve nonfeasible.</p> <p>ation projects updated if there ssive delays in executing the hedule.</p>	<p>See detailed budget and schedule for subprogram.</p> <p>9. By December 1997, the respective activities specified in the project report schedule are to have been completed.</p>	<p>Accounting records of UCP/DERT.</p> <p>9. Same as 7.</p>	<p>1-10 Counterpart funding for contra services available when requir</p> <p>1-10 No unwarranted protests or ch the pertinent legislation that ca excessive delays.</p>

works are indivisible there is no intermediate benchmarking, compliance with the execution schedule and design standards being deemed sufficient.

**DETAILED SCHEDULE OF BIDDING AND CALLS FOR PROPOSALS
STATE OF CEARÁ SECOND ROADS PROGRAM**

	SOURCE OF FUNDS	TOTAL AMOUNT (US\$000)	TYPE OF BIDDING	NUMBER OF CONTRACTS	NOTICES (QTR/YR)
CONSULTANCY CONTRACTS					
Program administration	Local	4,500	LCP	one	III/97
Studies and designs (626 km)					
1st group (413 km)	Local	1,800	LCP	various	I/98
2nd group (213 km)	Local	1,000	LCP	various	III/98
Works supervision					
1st group (388.7 km)	IDB/Local	5,300	ICP	various	IV/97
2nd group (455 km)	IDB/Local	3,000	ICP	various	II/98
3rd group (388 km)	IDB/Local	2,100	ICP	various	I/99
4th group (100 km)	IDB/Local	400	ICP	various	II/99
5th group (100 km)	IDB/Local	600	ICP	various	IV/99
CONSTRUCTION WORKS					
Divided highways in metropolitan area (51.7 km)	IDB/Local	45,000	ICB	five	III/97
Paving of main state roads (420 km)					
1st group (66 km)	IDB/Local	5,600	ICB	two	II/98
2nd group (254 km)	IDB/Local	21,500	ICB	to be defined	I/99
3rd group (100 km)	IDB/Local	8,400	ICB	to be defined	IV/99
Paving of access roads to municipal seats (450 km)					
1st group (132 km)	IDB/Local	7,500	LCB	four	IV/97
2nd group (84 km)	IDB/Local	4,800	LCB	to be defined	II/98
3rd group (134 km)	IDB/Local	7,600	LCB	to be defined	I/99
4th group (100 km)	IDB/Local	5,700	LCB	to be defined	III/99
Rehabilitation of main state roads (510 km)					
1st group (205 km)	IDB/Local	20,100	ICB	four	IV/97
2nd group (305 km)	IDB/Local	29,900	ICB	to be defined	II/98
Asphalt seal (350 km)					
1st group (100 km)	Local	2,000	LCB	three	IV/97
2nd group (250 km)	Local	5,000	LCB	to be defined	II/98
INSTITUTIONAL STRENGTHENING					
Reorganization of the DERT	IDB/Local	2,100	LCP	one	II/98
Training in environmental mgmt.	IDB	100	LCP	various	I/98
Training in road safety	IDB	200	LCP	various	II/98
Training in various topics	IDB/Local	300	LCP	various	II/98
Maintenance Admin. System	IDB/Local	500	ICP	one	II/98
Experimental sections	IDB/Local	200	Local agrmt.	two	III/98
Georeferenced Info. System	IDB/Local	150	Local agrmt.	one	IV/97
Strategic Computerization Plan	Local	750	LCP	various	IV/97
Environmental monitoring	IDB/Local	1,200	ICP	various	I/98
EQUIPMENT PROCUREMENT					
Pavement evaluation equipment	IDB/Local	100	LCB	various	II/98
Road safety equipment	Local	1,000	LCB	various	II/98
Scales and related equipment	IDB/Local	500	ICB	various	I/98
Weight control equipment	IDB/Local	1,200	ICB	two	III/98
Road maintenance equipment	Local	3,500	LCB	various	III/98

LCP – Local call for proposals
ICP – International call for proposals

LCB – Local competitive bidding
ICB – International competitive bidding

PROPOSED RESOLUTION

BRAZIL. LOAN /OC-BR. TO THE STATE OF CEARÁ
(Road Program for the State of Ceará - Ceará II)

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 Ceará, as Borrower, and the Federative Republic of Brazil, as Guarantor, for the purpose of granting the former a financing to cooperate in the execution of the Road Program for the State of Ceará (Ceará II). Such financing will be for the amount of up to one hundred fifteen million dollars of the United States of America (US\$115,000,000), from the Single Currency Facility of the Ordinary Capital resources of the Bank subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" set forth in the Executive Summary of the Loan Proposal.