

***INTER-AMERICAN DEVELOPMENT BANK***



***BRAZIL***

***CASTELLO-RAPOSO TOLL ROAD PROJECT***

***BR-0296***

***ENVIRONMENTAL AND SOCIAL IMPACT REPORT***

October 1998

Project Team: Ichiro Takano (Team Leader, PRI), Hiroshi Tomita (PRI), Robert Montgomery (PRI), Jacques Cook (Legal), Kristopher McCahon (PRI), Luis Rubio (Chief of Division 1, PRI), D. Freire and I. Muller (Environmental and Social Consultants)

## TABLE OF CONTENTS

### ACRONYMS AND INITIALS

|   |    |
|---|----|
| ACRONYMS AND INITIALS .....                   | 2  |
| 1.0 INTRODUCTION.....                         | 1  |
| 2.0 PROJECT DESCRIPTION.....                  | 1  |
| 2.1 The Project .....                         | 1  |
| 2.2 The Sponsors.....                         | 2  |
| 2.3 The Investment Program.....               | 2  |
| 2.4 Project Design and Inspection.....        | 3  |
| 2.5 Operation and Maintenance.....            | 3  |
| 2.6 Toll.....                                 | 4  |
| 2.7 Alternative Analysis .....                | 4  |
| 3.0 INSTITUTIONAL AND LEGAL FRAMEWORK .....   | 6  |
| 3.1 Institutional.....                        | 6  |
| 3.1.1 Highway System Concession .....         | 6  |
| 3.1.2 Environment .....                       | 6  |
| 3.2 Legal Framework.....                      | 7  |
| 3.2.1 Highway System Concession .....         | 7  |
| 3.2.2 Environment .....                       | 8  |
| 3.2.3 Indirect Legislation .....              | 9  |
| 3.3 Project Compliance Status .....           | 10 |
| 3.3.1 SP-280.....                             | 11 |
| 3.3.2 SP-270.....                             | 12 |
| 3.3.3 P-075.....                              | 12 |
| 4.0 ENVIRONMENTAL AND SOCIAL CONDITIONS ..... | 15 |
| 4.1 Environmental.....                        | 15 |
| 4.1.1 SP-270.....                             | 15 |
| 4.1.2 SP-280.....                             | 16 |
| 4.1.3 SP-075.....                             | 17 |
| 4.2 Social .....                              | 17 |
| 4.2.1 SP-270.....                             | 18 |
| 4.2.2 SP-280.....                             | 19 |
| 4.2.3 SP-075.....                             | 20 |
| 5.0 ENVIRONMENTAL AND SOCIAL IMPACTS .....    | 20 |
| 5.1 Construction Phase .....                  | 20 |
| 5.1.1 Environmental Impacts.....              | 20 |
| 5.1.2 Social Impacts.....                     | 21 |
| 5.2 Operation Phase.....                      | 22 |
| 5.3 Bypasses.....                             | 23 |
| 5.3.1 São Roque .....                         | 23 |
| 5.3.2 Brigadeiro Tobias.....                  | 23 |
| 5.3.3 Sorocaba.....                           | 24 |

|  |  |    |
|--|--|----|
| 5.3.4  | Crossing of Cotia .....  | 24 |
| 5.4  | Positive Impacts / Benefits .....  | 25 |
| 6.0  | ENVIRONMENTAL AND SOCIAL MANAGEMENT .....  | 25 |
| 6.1  | Mitigation and Monitoring Measures.....  | 26 |
| 6.1.1  | Program 1 – Characterization of Environmental Liabilities.....                     | 26 |
| 6.1.2  | Program 2 – Environmental Protection and Control.....                              | 26 |
| 6.1.3  | Program 3 – Conservation of Vegetation and Environmentally Protected Areas<br>28   |    |
| 6.1.4  | Program 4 – Social Action – Resettlement and Expropriation.....                    | 28 |
| 6.1.5  | Program 5 – Protection of Historic and Archaeological Assets .....                 | 29 |
| 6.1.6  | Program 6 – Institutional Support to Municipalities.....                           | 29 |
| 6.1.7  | Program 7 – Environmental Education, Social Communication, Health and<br>Safety 30 |    |
| 6.2  | Resettlement Plan .....  | 30 |
| 6.3  | Cost, Schedule and Responsibilities.....   | 32 |
| 6.4  | Environmental Management System.....   | 33 |
| 6.5  | Contingency Plan .....   | 33 |
| VII.   | PUBLIC CONSULTATION.....   | 34 |
| 8.0  | RECOMMENDATIONS .....  | 34 |
| ANNEX 1: PROJECT MAP   |  |    |
| ANNEX 2-1: IMPACTOS AMBIENTAIS POTENCIAIS (SP-280, SP-270 E SP-075) -<br>FASE DE IMPLANTAÇÃO |  |    |
| ANNEX 2-2: IMPACTOS AMBIENTAIS POTENCIAIS (SP-280, SP-270 E SP-075) -<br>FASE DE OPERAÇÃO    |  |    |
| ANNEX 3: Quadro síntese das Ações de Reassentamento  |  |    |
| ANNEX 4: SCHEDULE AND COSTS OF ENVIRONMENTAL ACTIVITIES                                      |  |    |

## ACRONYMS AND INITIALS

|          |  |
|----------|--|
| CETESB   | Technology and Environmental Sanitation Company ( <i>Companhia de Tecnologia e Saneamento Ambiental</i> )  |
| CONSEMA  | State Environmental Council ( <i>Conselho Estadual de Meio Ambiente</i> )  |
| CPRN     | Natural Resources Protection Office ( <i>Coordenadoria de Proteção aos Recursos Naturais</i> )   |
| DAIA     | Environmental Impact Analysis Department ( <i>Departamento de Avaliação de Impactos Ambientais</i> )   |
| DEPRN    | Natural Resources Protection Department ( <i>Departamento de Proteção aos Recursos Naturais</i> )  |
| DER      | Highway Department ( <i>Departamento de Estradas de Rodagem</i> )  |
| DNER     | National Highway Department ( <i>Departamento Nacional de Estradas de Rodagem</i> )  |
| EIA      | Environmental Impact Assessment ( <i>Estudo de Impacto Ambiental</i> )   |
| PBA      | Environmental Basic Plan ( <i>Plano Básico Ambiental</i> )   |
| RAP      | Environmental Preliminary Report ( <i>Relatório Ambiental Preliminar</i> )   |
| SMA      | Environmental State Secretariat ( <i>Secretaria de Estado do Meio Ambiente</i> )   |
| SPMA     | São Paulo Metropolitan Area ( <i>Região Metropolitana de São Paulo</i> )   |
| VIAOESTE | Concessionaire for Highways of the West of São Paulo State<br>( <i>Concessionária de Rodovias do Oeste do Estado de São Paulo – Via Oeste S.A.</i> ) |

## **1.0 INTRODUCTION**

- 1.1 The São Paulo highway network is quite important to the country's transportation system since a major part of country's traffic has its origin and destination in the State of São Paulo. Most of the highways in the State of São Paulo were built in the 1960s and 1970s, but due to a lack of resources, these highways have been inadequately maintained. Accordingly, this highway system urgently needs major rehabilitation and reconstruction work.
- 1.2 In 1996, the State of São Paulo launched a toll road concession program (Programa de Concessões de Rodovias Pedagiadas do Estado de São Paulo) aimed at privatizing the highway system. Objectives of the program are: i) to improve highway safety, ii) to reduce transportation costs in the state economy, iii) to rationalize the use of infrastructure, iv) to upgrade efficiency in the transportation sector and v) to upgrade the road capacity to correspond with economic demand.
- 1.3 To implement the program, State of São Paulo Highway Department (Departamento de Estradas de Rodagem do Estado de São Paulo - DER-SP) divided the highways into 22 sections called "Lots". The Castello-Raposo Toll Road Project (Lot No. 12 of the State toll Road Concession Program) and one of the most important and congested highway systems in the São Paulo Metropolitan Area (SPMA), links the city of São Paulo with neighboring areas.

## **2.0 PROJECT DESCRIPTION**

### **2.1 The Project**

- 2.1 The project consists of a concession for the construction, rehabilitation, upgrade, operation and maintenance of the approximately 156 km highway system that links the city of São Paulo with Sorocaba and Araçoiaba de Serra. All of the highways included in this concession are State roads. The DER-SP selected the winning consortium, VIAOESTE S.A., through an international competitive bidding process and granted the concession under a Build-Operate-Transfer (BOT) scheme to the company for a period of 20 years. After this concession period, the project will be transferred to the State Government. The State Government does not provide a traffic guarantee.
- 2.2 The highway system consists of three major sections: (i) SP-270 (Raposo Tavares Highway: 74.9 km), which connects São Paulo with Araçoiaba de Serra, (ii) SP-280 (Presidente Castello Branco Highway: 65.7 km), which links São Paulo to the western part of the State of São Paulo, and (iii) SP-075 (Senador Jose Ermirio de Moraes: 15.0 km), which links the western region to SP-280 (See Annex 1 for map).

- 2.3 The concession contract specifically does not include the construction in SP-270 of the bypasses of São Roque, Brigadeiro Tobias and Sorocaba, or the crossing of Cotia. These are the responsibility of DEP-SP. In addition, DER-SP is responsible for constructing access roads between SP-280 and SP-270.
- 2.4 The project is expected to: (i) improve traffic flow and alleviate congestion, especially in the eastern portion of SP-280, (ii) reduce travel time from 50% to 80% within currently congested areas (iii) improve safety, (iv) reduce vehicle operating cost, (v) provide better emergency and medical services, and (vi) significantly improve the general service quality.

## **2.2 The Sponsors**

- 2.5 The sponsors of the project are: Construtora Queiroz Galvão S.A. (Queiroz Galvão), Construtora Cowan Ltda. (Cowan), EIT - Empresa Industrial Técnica S.A. (EIT), Carioca Christiani-Nielsen Engenharia S.A. (Carioca), and Camargo Campos S.A. Engenharia e Comercio (Camargo Campos). All of them are Brazilian construction companies. To comply with the provisions of the bidding documents for the concession contract of the Castello-Raposo Project, the Sponsors have established a special purpose company VIAOESTE S.A., which is the concessionaire and the borrower for the proposed loan. Each sponsor holds 23.75% of the shares of the project company except for Camargo Campos, which holds only 5%.

## **2.3 The Investment Program**

- 2.6 The majority of the investments will be conducted during the first three years of the concession, from the year 1998 to the year 2001, with an estimated total project cost of US\$478 million.
- 2.7 There are additional investments during the year 2002, which are estimated to cost approximately US\$12.9 million. Since these investments are relatively small and they will be financed solely from the internal cash generation of the project, they have been excluded from the project cost.
- 2.8 The investment program for the project includes the following:
- (i) Eight toll plazas;
  - (ii) Two four-lane marginal express roads on SP-280 between km 14 and km 24 that will serve commuters to and from the Osasco area. Each marginal road will be located alongside the existing SP-280, but separate from the main lanes of SP-280;
  - (iii) Two additional lanes on SP-270, providing a four-lane divided roadway when completed. In addition, there will be two-lane marginal roads in each direction alongside SP-270 between km 40 and km 45;

- (iv) Two marginal two-lane roads parallel to SP-270 between km 89 and km 115. These marginal roads will be constructed later than the improvements to the mainline of SP-270;
  - (v) An operational control center near the municipality of Aracariguama on SP-280;
  - (vi) Three overpasses for pedestrians on SP-280 and six on SP-270;
  - (vii) Graded separate interchanges with local roads on SP-270;
  - (viii) Pavement rehabilitation where required;
  - (ix) A modern traffic control system consisting of new signaling and lighting systems, traffic surveillance and a central control center, a communications system including call boxes to be installed and seventeen changeable message signs;
  - (x) Medical first-aid stations and driver assistance services; and
  - (xi) Construction of three weigh stations to be operated by DER-SP.
- 2.9 Most of the investments are intended for SP-280 and SP-270. No major construction work is planned in the investment program for SP-075, except for one toll plaza to be constructed at km 12.5.
- 2.10 Construction has already started at three toll plazas on SP-280 (km 33 and km 74) and at one toll plaza on SP-270 (km 111.5). The investment work will be carried out by the consortium member's Construction contract with adequate insurance policies, a liquidated damages requirement, and several guarantees by the consortium members.
- 2.11 Although not part of the concession contract, the construction of the bypasses of SP-270 in São Roque, Brigadeiro Tobias and Sorocaba, in addition to a crossing in Cotia, will be completed under DER-SP responsibility. Construction of the bypasses is scheduled to start in April 1999 and should be completed in the first quarter of 2002.

## **2.4 Project Design and Inspection**

- 2.12 DER-SP will inspect the project design and construction to assure their conformity with the project standards and specifications. DER-SP standards and design criteria will be used for the design and construction of the project. According to DER-SP, its standards exceed those of the Federal Highway Agency (Departamento Nacional de Estradas de Rodagem - DNER), which generally conforms to the American Association of State Highway and Transportation Officials (AASHTO) standards.

## **2.5 Operation and Maintenance**

- 2.13 Regarding operation and maintenance, according to the bidding documents, the concessionaire is obligated to: (i) operate toll plazas and weigh stations, (ii) provide emergency medical and rescue services, (iii) monitor and control traffic, (iv) inspect

roads, and (v) develop and implement contingency plans for emergencies and/or traffic problems. Also, it is responsible for highway maintenance. The project started its operation in March 1998.

## 2.6 Toll

- 2.14 The project will have a total of eight toll plazas. The one currently existing toll plaza, located at km 33 of SP-280, has been operated by the State since 1979. The km 33 toll plaza generated about US\$47.2 million (R\$52 million) of toll revenue in 1997. Implementation of the new toll at the existing toll plaza started on March 31, 1998. An additional five toll plazas will start collecting tolls by the end of this year and the remaining two toll plazas on the SP-280 side-lanes will begin collecting tolls in 2000. The number of toll plazas for each highway section (current and at project completion) is as follows:

| Section           | Current | Project Completion |
|-------------------|---------|--------------------|
| SP-270            | 0       | 3                  |
| SP-280            | 1       | 2                  |
| SP-280 (marginal) | 0       | 2                  |
| SP-075            | 0       | 1                  |
| Total             | 1       | 8                  |

- 2.15 The tariff will be adjusted annually according to IGPM. There are six different tariff levels and a higher toll rate is charged depending on the type of vehicles and the number of axles. The tariff will be charged only for vehicles travelling in one direction. The tariff levels at the specific toll plazas will be changed after completion of the required investment program. The tariff levels at each toll plaza before and after project completion are as follows:

| Toll Plaza            | Direction to be tolled | Existing | Initial | Final   |
|-----------------------|------------------------|----------|---------|---------|
| P1 (SP-280)           | Westbound              | R\$4.40  | R\$4.40 | R\$4.00 |
| P2 (SP-280)           | Eastbound              | 0        | R\$2.80 | R\$2.80 |
| P3 (SP-270)           | Eastbound              | 0        | R\$1.80 | R\$3.80 |
| P4 (SP-270)           | Westbound              | 0        | R\$1.20 | R\$2.20 |
| P5 (SP-270)           | Westbound              | 0        | R\$1.80 | R\$3.20 |
| P6 (SP-280, marginal) | Westbound              | 0        | R\$2.80 | R\$2.80 |
| P7 (SP-280, marginal) | Eastbound              | 0        | R\$2.80 | R\$2.80 |
| P8 (SP-075)           | Westbound              | 0        | R\$1.60 | R\$2.20 |

## 2.7 Alternative Analysis

- 2.16 All of the highways of the Castello-Raposo System presently exist and the Project does not directly involve the construction completely new highways. The Project construction works consist of the widening of the present highway in certain limited



locations by the increase in the number of lanes through the construction of marginal or additional lanes. Thus, the Project design and analyses did not include a specific alternative analysis.

- 2.17 Although not part of the concession contract, DER-SP is responsible for the construction of the SP-270 bypasses in São Roque, Brigadeiro Tobias and Sorocaba, in addition to a crossing of Cotia. An analysis of alternatives was performed for each by-pass as part of the SP-270 Preliminary Environmental Report (RAP) which was presented to SMA (see section III for details). The analysis of the alternative routes included both technical and environmental criteria (e.g., land use, occupancy, geology, water resources, etc.). A brief summary of the assessed alternatives is presented below (see section 5.3 for additional details).
- 2.18 São Roque Bypass. Three alternative routes were considered: (i) the first one, closest to the urban area with an approximate extension of 5 Km goes along the existing railroad for some 2.7 Km, (ii) the second one, intermediate, with an approximate extension of 3.6 Km, crosses a 700m section in tunnel, (iii) the third, more distant from the urban area, with an approximate extension of 6.1 Km, goes around the hills crossed through by the tunnel in the second alternative. Considering the environmental and socioeconomic conditions the second (ii) alternative was chosen as the best option for the São Roque bypass.
- 2.19 Brigadeiro Tobias Bypass. Two alternatives were considered: (i) the first, with an approximate extension of 3.3 Km develops itself along the valley of the Piragiba-Mirim River, and parallel to the railroad, but still in the urban area, (ii) the second, with an approximate extension of 5 Km goes around the present urban area to the south. Considering the environmental and socioeconomic conditions the second (ii) alternative was chosen as the best option for the Brigadeiro Tobias bypass.
- 2.20 Sorocaba Bypass. Two alternative routes were considered: (i) the first making use of the existing highway stretches and the construction of one new section, with a total extension of 3.2 km, (ii) the second, making use of a former project developed by DER for a bypass from Sorocaba to Itapetininga corresponding only to its initial section of approximately 7 km. Considering the environmental and socioeconomic conditions the second (ii) alternative was chosen as the best option for the Sorocaba bypass.

### **3.0 INSTITUTIONAL AND LEGAL FRAMEWORK**

#### **3.1 Institutional**

##### *3.1.1 Highway System Concession*

3.1 The entities directly related to the concession to VIAOESTE are the State Commission of Concessions and the State's Highway Department (DER).

3.2 The Commission for the Monitoring of the Concessions and Permits of Public Services of the Transport Services was created by the Decree No. 43011/98 in order to manage the contracts of the concessions already formalized, to prepare regulations and procedures to control and supervise the concessions, and to develop studies aiming at the future a regulatory and supervision agency of the concessions. This Commission's responsibilities are: (i) constitution of technical groups in charge of the supervision of contracts, (ii) establishment of monitoring procedures, (iii) establishment of performance indicators and monitoring of its evolution, (iv) monitoring of the service level, (v) systematization of basic information, (vi) inspection of irregularities, (vii) the evaluation of the economical situation of the concession companies, (viii) execution of an inventory of the construction works, equipment and facilities, and (ix) monitor the transfer of the assets to state ownership. This Commission has a temporary character until the establishment of the regulatory supervision agency of the concessions has been established. This agency will adopt the same standards being adopted for the concessions of the electric sector. The new agency is expected to be created by the end of this year.

3.3 DER is subordinate to the Secretariat of Transportation of the State of São Paulo, subdivided in regional agencies responsible for different sections of the highways. The project is under the responsibility of DER-10 (capital) and DER-02 (Itapetininga). DER is responsible for building and operating state highways, and will become the operator of the highway network once the concession period has expired. DER's responsibility is to review the design of the construction documents for compliance with official standards and specifications as well as to obtain the preliminary environmental licenses of all the highways' constructions under concession. It is assumed that DER could only give into concession, improvements that were already authorized by Environmental State Secretariat (SMA). DER will also conduct inspection of the work during construction. In the Castello-Raposo System, DER is responsible for constructing the intersection between SP-270 and SP-075 (Sorocaba bypass) and the bypasses of São Roque and Brigadeiro Tobias, as well as the crossing of Cotia's urban area.

##### *3.1.2 Environment*

3.4 The National Environment Policy has created the National Environment System (SISNAMA), constituted by agencies and entities of the Federal, State and

Municipal Governments responsible for the protection and improvement of the environmental quality. The Federal Constitution granted authority to the states and local governments to legislate on environmental matters under their responsibility. The federal agency establishes general requirements of broad applicability, while the state and local agencies establish specific standards of enforcement. The establishment of regulations, criteria and standards concerning the control and maintenance of the environmental quality is responsibility, in the federal level, of the National Environment Council (CONAMA), the consulting and deliberative agency of SISNAMA.

- 3.5 Through subordinate agencies, Environmental State Secretariat (SMA) is the public entity responsible for the enforcement of the state environmental policy and compliance with legal environmental protection and control provisions. Legal provisions include, among others, the licensing of activities deemed to have an environmental impact and are therefore require submission of environmental documentation (e.g., RAP or RIMA). Within SMA, the Environmental Impact Analysis Department (DAIA) is responsible for the technical analysis of RAPs and RIMAs, and must submit its Technical Appraisal (*Parecer Técnico*) to CONSEMA (State Environment Council) for approval.
- 3.6 CONSEMA, an agency related to SMA and legislated by the State Constitution, is responsible for the formulation of the state environment policy and issue of norms and procedures, which regulates environment protection and controls instruments within the State of São Paulo. CONSEMA has 38 members, 50% of which are the representatives of state government agencies and the remaining of non-government organizations, including nine members of environmental organizations. CONSEMA is responsible for the analysis of DAIA's Technical Appraisal and for the final decision on the approval of EIAs, and may incorporate additional recommendations or requirements to be fulfilled in the project's licensing phases. In addition, CONSEMA is also responsible for organizing a public hearing regarding EIA projects under the licensing process.

## **3.2 Legal Framework**

### **3.2.1 Highway System Concession**

- 3.7 The Federal Constitution establishes that it is the responsibility of the public authority, directly or under concession or permission, to offer public services. Federal Laws No. 8987/95 and 9074/95 regulate the concession regimen of public services defining the concession preceded of the execution of public construction work as: "construction, total or partial, conserving, remodeling, expanding or upgrading of any works of public interest delegated by the conceding authority - through auction, in the modality of a bidding, to the juridical person or consortium of companies that demonstrates capacity for its achievement, by its own responsibility

and risk, so that the investment of the concessionaire be compensated and amortized, by means of the exploration of the service or of the work within a determined term.”

- 3.8 The concession regimen of the public services of the State of São Paulo is regulated by Laws No. 6544/89, 7835/92, and 9361/96. Decree No. 40000/95 instituted the State Public Services and Execution of Infrastructure Works Private Sector Participation Program, and Law No. 9361/96 instituted the State Privatization Program.
- 3.9 Decree No. 40640/96 (altered by Decree No. 41722/96) approved the Concession Regulation of the Public Services of Exploration of the Castello-Raposo System. Decree No. 41720/97 authorized the auction for the concession of public services exploration of the Highway System constituted by the highway network, which connects São Paulo to Sorocaba.
- 3.10 State Law-Decree No. 13626/43 defines standards and specifications for the route layout of the state roads. This legislation, of 1943, defines the width of right of way of state roads to be a minimum of 50m and of 80m when near urbanized areas. For the more recent highways built in the state, specific laws defined the width of the right of way.
- 3.11 Besides these legal documents concerning the concession of the road system, rules and regulations defined by DER for the expansion and maintenance of the state highways must be met. The DER, in collaboration with specialized technical consultants, is currently preparing environmental specifications manuals adapted to the local conditions. The conclusion of a first version of these manuals is scheduled for Dec./98 for discussion by SMA and subsequent consolidation.
- 3.12 DNER manuals do not directly apply to these roads, since the system comprehends only state highways, although they have been used as reference for the DER.

#### 3.2.2 *Environment*

- 3.13 The National Environment Policy is regulated by Federal Law No. 6938/81 (altered by Laws No. 7804/89 and 8028/90) and by the 1988 Federal Constitution which determines that: “all have a right to an ecologically balanced environment, of common use to the people and essential to the healthy quality of life. Thus, imposing to the public authority and to the community the obligation to defend and preserve it for present and future generations.”
- 3.14 CONAMA Resolution No. 001/86 defines environmental impact and provides a list of environmental-changing activities that depend on the preparation of an Environmental Impact Assessment (EIA). The said provision was confirmed by CONAMA Resolution No. 237/97, which expands the list of Activities or

Enterprises Subject to Environmental Licensing, with emphasis on “Civil Works - roads, railways.

- 3.15 The State Constitution publicized in 1989 dedicates its Chapter IV to the Environment and State Law No. 9509/97 which disposes the Environment State Policy establishing its objectives, formulation and application mechanisms, and constituting the State Environmental Quality Management, Protection, and Control System - SEAQUA.
- 3.16 The licensing process established by the National Environment Policy comprises three phases, as follows: (i) Preliminary License (LP), required during the planning stage and consists of an Environmental Impact Assessment (EIA), (ii) Installation License (LI), required prior to works and consists of submittal the respective engineering design and an Environmental Management Plan (PBA), and (iii) Operation License (LO), required after the completion of works and actual commencement of road operation. The CONAMA Resolution 237/97 grants the concerned environmental agency to set the validity terms of licenses, specifying them on the correspondent document, taking into consideration the following aspects: (i) LP validity term will be no more than five years, (ii) LI validity term will be no more than six years, (iii) LO validity term will be no less than four years and no more than ten years. LP and LI validity terms may be extended provided that not exceeding the maximum terms provided for herein above.
- 3.17 In the State of São Paulo environmental permits have been regulated since 1994 by SMA Resolution No. 42/94. It was only from this date on that SMA began to issue formally the LP, LI, and LO established by the federal legislation. Until then, only the installation and operation permits or simple authorizations were issued.
- 3.18 This Resolution establishes an additional stage to the environmental licensing process introducing the Preliminary Environmental Report (RAP) which must be submitted to SMA in order to obtain its decision upon the need for an Environmental Impact Assessment (EIA or RIMA). As a result of the analysis of the RAP, SMA may issue a Preliminary Permit (LP) or request a RIMA. Before 1994, SMA decided that there was a need of an EIA/RIMA without the requirement of detailed environmental evaluation or any such other documents.

### 3.2.3 *Indirect Legislation*

- 3.19 Apart from the legislation mentioned above, the project should also observe the following federal legal regulations: CONAMA Resolution No. 002/96 which establishes the distribution of resources of 0.5% minimum of the value of the investment to repair the environmental harm caused by the destruction of forests and other ecosystems (SMA will establish if this compensation is required in Castello-Raposo project); Law No. 4771/65 – Forest Code which disposes about the protection and preservation of the significant vegetation; Law No. 5197/67 which

disposes about the protection of the fauna; Law No. 6766/79, that regulates land use for urban purposes and defines as *non aedificandi* the 15m wide area along both sides of the right of way of the highways; and Law No. 86176/81 which disposes about the creation of Ecological and Environment Protection Areas.

- 3.20 Federal Law No. 7347/85 (altered by Laws No. 7804/89 and 8028/90) regulates the public civil action of responsibility for damage done to the environment, the consumer, and the estates' rights of artistic, esthetic, historic, and touristic assets. Federal Law No. 9605/98 disposes about the administrative and penal sanctions proceeding from harmful actions to the environment.
- 3.21 Federal Decree No. 96/88 approves the regulation of the transportation of hazardous products on roadways, complemented by the Ministerial Edict No. 291/88. Law No. 7802/89 and Federal Decree No. 98816/90 should also be observed which regulate the transportation of agricultural-toxic and dangerous products; CONAMA Resolution No. 1-A/86 which forces the transporter of dangerous products to communicate the transportation of those products to the state environmental agencies with a minimum antecedence of 72 hours.
- 3.22 The State Law No. 997/76 (regulated by Decree No. 8468/76) created the Prevention and Pollution of the Environment Control System for the enterprises considered pollutants, such as concrete and asphalt preparation sites transitorily implanted for the civil works, as well as pavement and construction of other architectural works.
- 3.23 Within the State, the following legal devices relating to the vegetation and landscape of the right of way should also be observed: Law No. 3735/83 which disposes the planting of fruit trees along the state highways; Law No. 5255/86, disposes the conditions for vegetation removal in the areas contiguous to the state highways.

### **3.3 Project Compliance Status**

- 3.24 A summary of the project compliance with applicable is presented in Table 3-1, and a detailed chronological history is described below. As defined in the Concession Contract, DER is responsible for obtaining the Preliminary License (LP) for SP-270. The concessionaire has the responsibility to obtain all other authorizations, including other authorizations for SP-270, authorization for construction of marginal lanes for SP-280, and SP-075. The only requirement for other project interventions (e.g., toll plazas, conservation and maintenance, work camps and send-off areas) is a simple authorization for removing vegetation cover and earthworks from the Natural Resources Protection Department (DEPRN) of SMA.
- 3.25 Although SP-280, SP-270 and SP-075 are all included in the project as one package, the present compliance status of each route is different from those of the other two. Accordingly, it is necessary to analyze each highway's compliance status separately.

### 3.3.1 SP-280

- 3.26 The construction of the marginal lanes of SP-280 was first planned in 1990, when DER submitted the project to SMA requesting an exemption from the EIA/RIMA. At that time an Environmental Characterization Report was presented to support the decision for the exemption of EIA/RIMA since SMA was not requiring a Preliminary Environmental Report (RAP) and the decision upon the necessity of submitting an EIA/RIMA was taken based on information presented on the project and environmental conditions of the direct area of influence. In 1991, SMA issued a Technical Appraisal (*Parecer Técnico*) which exempted the SP-280 project from presenting an EIA/RIMA. This appraisal also specified requirements to be performed in order to obtain the Installation License (LI) and subsequently the Operation License (LO).
- 3.27 In 1991, DER presented the additional information required for obtaining the Installation License (LI), including the mitigation measures that would be implemented related to cuttings and fills, watercourses crossings, drainage systems, removal of significant vegetation, send-off areas, landscape, and pedestrian overpasses. Based on the information presented, SMA issued an Installation License (LI), except for those areas where non-property owners living in the right of way would have to be relocated (i.e., Osasco area), for which DER required a Resettlement Plan. The LI issued had no expiration date.
- 3.28 During the 1990s the Municipality of Osasco has been implementing an urban development program which included housing projects for low-income areas. As part of this housing project, approximately 425 families who had been living in portions of the right-of-way needed for the SP-280 road expansion (i.e., side lanes) received from the municipality a lot of land to build their own houses. The families received lots with normal infrastructure (e.g., water, sewage, electricity) free of charge (for more details on the resettlement plan developed by the Municipality of Osasco see section VI). This reduced the number of residents living in the right of way from approximately 500 to 75 families.
- 3.29 In 1998, when the Castello-Raposo highway system was granted under concession, VIAOESTE initiated actions to obtain the Installation License for the entire SP-280 road, including the areas occupied with non-property owners. In August 1998, VIAOESTE requested SMA to reconfirm the LI issued in 1991 was still valid and also submitted a Social Action Plan for the resettlement of the non-property owners still living in the right of way. SMA analyzed the Social Action Plan and additional information was requested.
- 3.30 In September 1998, SMA reissued the LI for all portions of SP-280, except a portion of the marginal (side) lanes where non-property owners are still living. The license corresponds to 90 % of the marginal lanes.

3.31 In October 1998, VIAOESTE finalized a Preliminary Resettlement Plan, which complies with SMA's requirements and the Bank's Policy on Involuntary Resettlement (August 1998)(for more details on this Resettlement Plan see section VI). This Preliminary Resettlement Plan is being submitted to SMA in conjunction with an agreement between VIAOESTE and the Municipality of Osasco regarding the resettlement activities.

### 3.3.2 *SP-270*

3.32 In March 1997, DER submitted to SMA a Preliminary Environmental Report (RAP) for the expansion of SP-270 highway, as defined in the concession contract, for the section between Cotia (Km 34) and Araçoiaba da Serra (Km 115). The RAP excluded the urban sections in São Roque and Brigadeiro Tobias which are not part of the concession contract and for which DER stated that they would present a separate environmental report. Associated with the RAP submittal, DER published in local and regional newspapers notices informing the public that the RAP had been submitted to SMA, was available for review, and that any comments, suggestions or complaints should be sent to SMA.

3.33 SMA analyzed the RAP and concluded that it was insufficient since it did not include the bypasses of São Roque and Brigadeiro Tobias or present a solution for the crossing of Cotia's urban area.

3.34 In September 1998, DER submitted to SMA a revised RAP for the expansion works of the highway including the execution of the bypasses of São Roque, Brigadeiro Tobias, and Sorocaba (connection between SP-270 and SP-075) which are located in the concession of VIAOESTE by are not the responsibility of VIAOESTE to construct (per concession contract) and an approach for the crossing of the municipality of Cotia (located out of the concession area). Notice was again provided to the public stating that the revised RAP had been submitted to SMA, was available for review, and that any comments, suggestions or complaints should be sent to SMA.

3.35 SMA is presenting analyzing this RAP and a "technical information meeting" is scheduled to be held by November 8, 1998 (for more information, see section VII). The analysis process of RAP should be concluded in December 1998 and it is anticipated that the LP is expected to be issued for all the sections to be widened and the LI for the section between Sorocaba and Araçoiaba da Serra.

### 3.3.3 *P-075*

3.36 No environmental licenses (LP, LI or LO) are required for this road since there are no works planned for it except for the toll plaza in Km 12.5 that had been already authorized by DEPRN.





TABLE 3-1  
Project Compliance Status

| Work/<br>Intervention   | Current situation  | Next Stages   |
|---|--|---|
| SP-280<br>Construction of<br>the marginal lanes<br>between Km 14<br>and 22          | 1990: exemption of EIA/RIMA<br>1991: LI, except for the area with <i>favelas</i><br>Sept/98: LI reissued by SMA, except for<br>the area with <i>favelas</i>  | Submittal of a<br>Resettlement Plan in<br>order to obtain the LI<br>for the whole section   |
| SP-270<br>Expansion<br>between Km 34<br>and 115                                     | Sept/98: RAP submitted to SMA, including<br>bypasses of São Roque, Brigadeiro Tobias<br>and Sorocaba   | Analysis of RAP by<br>SMA and issuance of<br>the LP   |
| Toll plazas   | 1998: authorization requested for toll<br>plazas: (i) Km 12,5 of SP-075, (ii) Km<br>74.5 of SP-280, and (iii) Km 111.5 of SP-<br>270<br>Authorizations issued for Toll Plazas on<br>Km 12.5 of SP-075 and Km 74.5 of SP-<br>280 (DEPRN No. 48/98 and 56/98)  | Toll Plaza on Km<br>111.5 of SP-270 to be<br>submitted<br><br>Request authorization<br>for toll plazas on Km<br>45 and 80 of SP-270 |
| Conservation and<br>Maintenance<br>including the<br>Cleaning of the<br>Right of way | Apr/98: authorization requested for<br>removing vegetation in Permanent<br>Preservation Areas – APP (SP-270, SP-280<br>and SP-075)<br>Jun/98: requested authorization for arboreal<br>removal in the right of way of SP-270<br>Sept./98: DEPRN 110/98 and 111/98<br>authorizations for vegetation pruning in the<br>right of way of SP-270, from Km 34.0 to<br>Km 46.5 and of SP-280, from Km 13 to<br>Km 43 | Authorization for<br>remaining sections not<br>yet issued   |
| Send off areas<br>and work camps  | 1998: authorization requested for the<br>following send off areas: (i) CCO, (ii) 1 to<br>10 on SP-270, (iii) Km 74.5 of SP-280<br>No authorization has been requested for<br>work camps  | Authorizations not yet<br>issued  |
| Asphalt<br>preparation sites,<br>quarries and sand<br>pits                          | VIAOESTE will only use existing asphalt<br>preparation sites, quarries and sand pits<br>with permits by SMA  |   |

## **4.0 ENVIRONMENTAL AND SOCIAL CONDITIONS**

### **4.1 Environmental**

- 4.1 The environmental conditions applicable to each road segment are summarized below, with the exception of climate and air quality, which are summarized together since these conditions are relatively similar for the entire project area of influence.
- 4.2 The area of influence of highways SP-280 and SP-270 presents two distinct climatic units. The first, in the region of Sorocaba, is a tropical climate that is alternately dry and humid with rainfall annual means around 1,100mm and temperatures between 20 and 21°C. The second, closer to the SPMA consists of a subtropical continental climate with annual precipitation between 1,300 and 1,500 mm and annual temperatures around 20°C. The rainy season is between December and March.
- 4.3 The air quality in the highways' area of direct influence is considered good, with some vehicular emissions from the highway traffic, dust generated by traffic on nearby unpaved roads, and light industrial emissions. In Sorocaba atmospheric pollution is more significant because of the large concentration of industrial plants. In the urban areas of Cotia and Osasco, the air quality is also affected by the extensive traffic concentration and industrial activities.

#### **4.1.1 SP-270**

- 4.4 SP-270 is located in the Planalto Cristalino, a geological structure modeled by erosive processes with elevation variations of 100 to 200 m. Near São Roque, the terrain is more undulated, with slopes between 30 and 50% and narrow and deep valleys. The western section the highway penetrates the Peripheral Depression, which has a smoother topography. At this point, the valleys of the principal affluent of the Sorocaba River are separated by slopes of 7 to 15% in declivity.
- 4.5 Among the main geological structures are the faults proceeding from the regional extension, with emphasis on the Taxaquara fault, which intersects the highway course near Mailasqui, and the Mairinque fault near the city of the same name. The highway is located in a seismically inactive area where slope instability is related to the more undulating areas.
- 4.6 The area of influence of SP-270 has a relative abundance of superficial water resources, most of which are polluted by urban and industrial wastes. The two aquifer systems in the area, Tubarão and Cristalino have been tapped by wells of approximately 200-300 m and 80-100 m deep, respectively. The main river that the existing highway crosses is the Sorocaba River. SP-270 also crosses several other smaller rivers such as the Mombaça, Pirajibu, Pirajibu and Mirim rivers and Ribeirão do Varjão. The lowlands crossed by the highway are subject to periodic floods especially those lowlands near the Sorocaba and Aterrado rivers. The remaining

areas have more dense drainage standards, especially where the terrain is more irregular. To the west of Sorocaba, the smoother surface reduces the quantity of drainage and streams that are intercepted.

- 4.7 In the area of influence, the main water supply sources are: the Orlando Maia (Alumínio), the Carambeí River (São Roque e Mailasque), the Sorocabuçu River (Ibiúna), the Lajeado and Pirapora rivers and the Maria da Glória Reservoir (Araçoiaba da Serra), the Itupararanga Reservoir (Sorocaba, Brigadeiro Tobias and Mairinque), the Morro Grande Region (Vargem Grande Paulista e Cotia). In case of an accidental spill involving hazardous products, some of these water supply sources could be affected, such as the water catchment of the Lajeado River in Araçoiaba da Serra, where one of its affluent runs parallel to the highway.
- 4.8 The area of influence presents traces of fragmented secondary forests. The predominant vegetation is composed of small and discontinuous patches of brush over irregular terrain with more significant vegetation corresponding to the mountainous formations between Cotia and São Roque. Most of the watercourses lack riparian vegetation. Up to Km 90, SP-270 passes through a Dense Ombrofilos Forest characterized by secondary vegetation and agricultural activities. The last section of the highway enters an intermediate zone where forests meet the savanna. The most significant patches of vegetation occur between Cotia and Km 50. The reforestation is more representative in the section situated between Mairinque and Brigadeiro Tobias.
- 4.9 The original fauna of the region consists of the typical species of the *Mata Atlântica* and the savanna (*Cerrados Paulistas*). In the first case, there are bats of various families, various rodents, small mammals (*mico-prego*, *gato-do-mato*) and many kinds of birds (*inhambu*, *aracuã*, *jacu* and *alma-de-gato*). The adapted species of the savanna are *tatu-galinha*, *veado catingueiro*, *gambá*, *teiú*, *cascavel*, several species of frogs, *pica-pau*, *urubu*, *raposinha*, etc. The Morro Grande Forest Preserve in Caucaia do Alto presents the environment with the highest degree of preservation embracing a significant amount of the original fauna.
- 4.10 The legally-protected natural areas are: the Morro Grande Forest Preserve (Caucaia do Alto) and the Morro Grande State Preserve (in Cotia), the State Preserve of the second perimeter of São Roque in Ibiúna and Piedade near the Serra do Mar. None of these areas will be directly affected by this project.

#### 4.1.2 SP-280

- 4.11 SP-280 begins in the region of the Planalto Paulista, characterized by rounded hills, straight to convex slopes and closed valleys. For the first two kilometers of the concession, the highway passes along both sides of the Tietê River moving away from it near Osasco. The highway runs along the Tietê river basin that contains water resources mostly polluted by urban and industrial waste. The marginal lanes will

cross only a deactivated section (*braço morto*) of this river near Osasco. From Km 31, it develops over a mountainous crystalline plateau, which presents altitudes as high as 1,250 m and valleys around 600-750 m deep. From Km 70 to the end of the concession is the Peripheral Depression, which is characterized by a smooth relief of wide and medium height hills.

- 4.12 Along the eastern section, which has been fairly altered by humans, there are practically no remaining expressive forests and the coverage vegetation is constituted by extensive grassfields intermingled with eucalyptus and pinus plantations. Beyond km 31, there are many secondary forest remnants of varying form and size from the Dense Ombrofilos Forest in an advanced stage of forest succession. These remnants can be found alongside the highway and are generally associated with drainage lines and intermingled with the original vegetation and shrubbery. Grass fields are restricted to the side slopes and highway median.
- 4.13 In the indirect area of influence of the highway, there are several areas of note: the *Serra do Boturuna* (Santana do Parnaíba) legally protected natural area, the Environmental Protected Area – APA of Cabreúva, the Pedreira de Varvitos in Itu, and the municipal APA of Itu.

#### 4.1.3 SP-075

- 4.14 SP-075 is located in the Peripheral Depression, characterized by smooth topography with wide and medium height hills, and altitudes between 100 and 300 m. The valleys are wide with slopes of up to 15% declivity. The soils in the region are mainly sandstone of heterogeneous granulation. Close to the SP-280 interchange, some crystalline rocks emerge in the terrain.
- 4.15 The highway crosses several small rivers that flow into the Sorocaba River. The main river that SP-075 crosses in this section is the Pirajibu River.
- 4.16 The characteristics of the original vegetation of the area of influence of SP-075 have been substantially altered. Along the road, several artificial forests (pinus and eucalyptus) can be found, accompanied by deteriorated areas without vegetation or with a very poor vegetation cover.

## 4.2 Social

- 4.17 The Castello-Raposo System encompasses 14 municipalities, seven of which are within the São Paulo Metropolitan Area (SPMA). With 16 million habitants, the SPMA is Brazil's largest urban area and its most important economic center. Recent urbanization trends show dynamic growth with a westward orientation, mainly along SP-280. Changes in the metropolitan area's economic structure over the past decade have preferred the service sector to the industrial sector. Consequently, industries are

leaving the SPMA and moving toward the hinterland of São Paulo State and other states.

- 4.18 Concentration of industry along SP-280 and SP-270 is less pronounced now than in the past. Trends reveal movement toward the location of storage centers and high-income residential condominiums along SP-280. Current developmental patterns along SP-270 reveal urbanization in communities along this highway.
- 4.19 The Region of Sorocaba has emerged as important agricultural, industrial and service center. This region is characterized by an extensive urban-industrial development, only surpassed in the State by Campinas Region. Sorocaba is strategically located on the way to the States of Mato Grosso do Sul and Northern Paraná, which are expected to generate increased traffic along SP-280.
- 4.20 A summary of the social-economic conditions applicable to each road segment is presented below.

#### *4.2.1 SP-270*

- 4.21 The municipalities through which SP-270 passes as part of the concession are: Cotia (excluding urban area), Vargem Grande Paulista, São Roque, Mairinque, Alumínio, Sorocaba and Araçoiaba da Serra. These municipalities have a population of 707,675 inhabitants (1996) living mainly in urban areas (95,6%). The most populated cities are Sorocaba with 430,612 inhabitants and Cotia with 126,598 inhabitants. The demographic density of this area is approximately 413 inhabitants/km<sup>2</sup>.
- 4.22 The majority of the population (65.2%) is between the ages of 15 and 64 years old. Most of the families in the municipalities along the highway have salaries between 1-5 minimum wages (1 minimum wage = US\$ 110.00 per month).
- 4.23 The economic profile of the region includes industrialized municipalities specializing in the textile, clothing, shoes, fabric artifacts, metal-mechanic, electric material and communication sectors. The most industrialized municipalities are Votorantim, Mairinque, São Roque, Piedade and Salto de Pirapora, with emphasis on Sorocaba. The livestock industry though has exhibited a significant decrease in its activities.
- 4.24 Some vendors can be found along the right of way, especially nearby Vargem Grande Paulista and Cotia, but they do not work by the road on a regular basis.
- 4.25 Although Cotia may present the characteristics of a “bedroom community” it is also an important medium and high-income residential region. Along the section between Cotia and São Roque, which has more irregular topography, there are many small farms, leisure country-houses, malls and condominiums. In contrast, from Mairinque onwards there are many big agricultural properties, forest areas, pastures and horse breeding areas, and industrial activities associated with Sorocaba.

- 4.26 The region around São Roque presents isolated densely populated areas that correspond to those closest to the urban center along the roads that cross the railroad. There are also areas of sparser natural and planted vegetation near the country-houses and hotels.
- 4.27 In Brigadeiro Tobias, urban occupation, small farms and extensive reforested areas occupy the southern portion of SP-270, which runs along the valley where it encroaches precariously on natural vegetation and reforested massifs.
- 4.28 In the areas surrounding Sorocaba, there are large-scale industrial sites, small farms, country-houses and high-income residential condominiums. The Sorocaba City Hall and a university are located in this area.
- 4.29 In the urban area of Cotia the land occupation encroaches close to the area of the right-of-way. This area is mainly occupied by commercial installations and side walks. In the first section, the occupation is very close to the existing highway, which generates serious spatial limitations. This road section is not part of the concession.
- 4.30 The most prominent archeological and historic heritage of this area relates to the pre-colonial indigenous occupation and the historical processes of that occupation during the colonial period. It is possible to identify isolated findings on exhibit at the Historic Museum of Sorocaba. There are four archeological Tupi-Guarani sites in Sorocaba, one of which is situated alongside the highway. The area has not been studied in order to identify archeological sites, but there is some evidence that there could be sites within the right of way. There are several historical sites in the indirect area of influence of the highway. There is a small chapel located within the right of way, nearby Sorocaba (*Bairro Marmeleiro*). The chapel, constructed in the early 20<sup>th</sup> century, is not protected by law, but the local population values it.

#### 4.2.2 SP-280

- 4.31 The municipalities through which SP-280 passes as part of the concession are Osasco, Barueri, Jandira, Itapevi, Santana do Parnaíba, Araçariguama, São Roque, Mairinque, Itu and Sorocaba. These municipalities have a total population of 1,719,334 inhabitants (1996) 97.7% of which live in urban areas. The most populated cities are Osasco with 621,943 inhabitants, Sorocaba with 430,612 inhabitants and Barueri with 176,345 inhabitants. The demographic density is approximately 797 inhabitants/km<sup>2</sup>. Osasco (9,138.46 inhabitants/km<sup>2</sup>), Jandira (3,418.45 inhabitants/km<sup>2</sup>), Cotia (2,882.64 inhabitants/km<sup>2</sup>) and Itapevi (1,687.14 inhabitants/km<sup>2</sup>) have the highest demographic density with 100% of the population living in urban areas.
- 4.32 The land use and occupancy has various forms along the highway. Osasco is an active business area and land use is characterized by a significant concentration of

industries and medium and low-income residential areas. After Osasco, high-income residential areas (Alphaville and Tamboré, municipalities of Barueri and Santana do Parnaíba) associated with business areas have been developed. Inhabitants of these areas represent a major reason for future marginal lanes.

- 4.33 The urban expansion of the SPMA during the last two decades along the highway resulted in a continuous urban area from São Paulo to Barueri. Therefore, this first section of the highway is highly congested, especially during rush hours. Beyond Barueri and Jandira, occupancy near the road course becomes sparse, and crop and livestock production, reforestation, leisure-oriented or recreational estates, and high-income residential developments predominate.

#### 4.2.3 SP-075

- 4.34 The section of SP-075 under the concession passes through the municipalities of Sorocaba and Itu were previously discussed. The land use occupancy presents several industries nearby Sorocaba urban area. Along the section between Sorocaba and SP-075 there are many large agricultural properties, pastures and horse breeding areas.

## 5.0 ENVIRONMENTAL AND SOCIAL IMPACTS

- 5.1 Most of the negative impacts related to the Castello-Raposo project will occur during the construction phase. During the operation phase, the impacts are expected to be more likely positive than negative. A table of all the potential impacts during both phases is presented in Annexes 2-1 and 2-2 (Construction and Operation Phases respectively) and is summarized below.

### 5.1 Construction Phase

- 5.2 The main impacts related to the construction phase of the Castello-Raposo project are: increase in soil erosion and storm water runoff causing pollution of watercourses, expropriations, and resettlement of non-property owners located illegally within the right of way in the Osasco area of SP-280.

#### 5.1.1 Environmental Impacts

- 5.3 The impacts arising from construction works are: alteration of air quality, increase in noise levels and vibrations, spills and wastes dumped from work camps and work areas, alteration of water quality, increase of erosion and sedimentation problems, removal of vegetation and loss of animal species. A description of these potential impacts is presented below.



- 5.4 Induction of Erosive Processes. In the construction phase, the most significant impacts are related to the possibility of erosion, the construction of viaducts and bridges that demand great volumes of excavated earth for land filling purposes, the use of explosives in the fragmentation of rocks and construction of deep drains and channels, and land deforestation and clear-cutting that may cause erosive processes and sedimentation of draining systems. Along SP-270, the areas most susceptible to erosive processes, discharges, and landslides in fill slopes are those that will demand a higher number of rock cuttings performed above 4 m. Potential risks of slope slides are found between km 68.0 and km 89.0. In addition, areas of alluvial plains with larger watercourses are more susceptible to discharges, sedimentation, and floods. Along SP-280, the smoother relief is likely to reduce the risk of induction to erosive processes.
- 5.5 Earth Movement. The construction of the new lanes will involve significant earth movement, especially in SP-270. The largest volumes to be moved are cuttings and fills are located between km 68.0 and km 89 of SP-270, and near the new bypasses of São Roque and Brigadeiro Tobias. With regard to the construction of SP-280 marginal lanes, the earth balance is practically even, demanding only temporary stock areas.
- 5.6 Job Sites, Excavation Areas, and Waste Soil Areas. The set up of job sites, based on the need for infrastructure works including the availability of potable water, disposal of solid waste and sewerage, filtering devices, and oil retention, poses a potential environmental impacts. All job sites, soil excavation areas, and waste soil areas will be subject to specific licensing. Work camps are not necessary because most workers will be hired locally.
- 5.7 Water Resources. The works may cause temporary obstruction of water sources, small drains and streams, sedimentation of flooding areas and marshlands, changes in natural draining systems, disposal of wastes such as oils and grease, garbage and sewage with possible modification in the water quality of streams and rivers located in the area. The lane and shoulder treatment during paving poses the risk of generating wastes that can be picked up by storm water, thus affecting the soil and watercourses. An eventual accidental obstruction of the Córrego dos Granitos during work may threaten the water circulation system at Cia. Brasileira de Alumínio aluminum plant.
- 5.8 Removal of Vegetation. The expansion of SP-270 will cause interference with permanent preservation areas (258,550m<sup>2</sup>) and other areas covered with vegetation (100,700m<sup>2</sup>), with indirect consequences on fauna. Along SP-280, no significant vegetation will be removed due to the construction of the marginal lanes.

#### 5.1.2 *Social Impacts*

- 5.9 Expropriations. The expansion of SP-270 and the construction of SP-280 marginal lanes, especially at the intersections, will require expropriations. The expropriations in SP-270 apply for regular property owners but no households/families and businesses have identified. In terms of SP-270, preliminary estimates show that approximately 2,500,000 m<sup>2</sup> will be necessary, comprising all intersection, in addition to small areas that must be added to the right of way because of the construction of cutting and fill slopes of the new lanes, or also of the marginal lanes (regarding the section between Sorocaba and Araçoiaba da Serra). The great variation in width of the right of way, including sections where the width is unknown, has complicated the precise demarcation of areas to be expropriated. In September 1998, VIAOESTE started a precise survey of the necessary demands for expropriation. With regard to SP-280, expropriations are limited to intersection, since the marginal lanes are fully constructed within the existing right of way. Considering that intersections are yet to be fully defined, preliminary estimates show that expropriations will be around 590,000 m<sup>2</sup>.
- 5.10 Resettlement of Favelas. The construction of SP-280 marginal lanes is dependent on the appropriate resettlement of non-property owners within the right of way in the municipality of Osasco. A survey conducted in April 1998 conducted by VIAOESTE as part of the development of the Resettlement Plan has identified three groups of *favelas* in the right of way, totaling 75 families (318 people: average of 4.2 people/family). Around 45% of the families reported an income no higher than 3 minimum salaries, and 15% reported no income. Around 30% of the people were not employed, and 18% of them worked in the underground economy. Nearly 80% of them have not completed elementary school. Most heads of households are males, between 26 and 40 of age. The population in the age bracket 0 - 14 represents 44% of the total. Most houses are made from wood and have 1 or 2 rooms.
- 5.11 Risk of Accidents. Other impacts involve disturbances associated with the traffic of vehicles, such as detours and slow traffic, higher emission of dust and formation of mud, which contribute to accidents.
- 5.12 Interference with Sanitary Infrastructure. There can be impacts on the sanitary and drainage infrastructure networks at both, SP-270, in Cotia, Vargem Grande Paulista, Mairinque, and Brigadeiro Tobias, and SP-280, in Osasco, Carapicuíba, Tamboré, and Alphaville.
- 5.13 Archeological and Historical Heritage. Since the archeological heritage has never been surveyed as a single unit, expansion works along SP-270 may affect structures of archeological interest. A small chapel built in the beginning of the century that enjoys “popular appreciation” is the only historical site located in the foreseen expansion area.

## 5.2 Operation Phase

- 5.14 During the operation phase, the major potential impacts are related to barrier effects of toll booths on local traffic and potential water pollution due to spills or storm water runoff (see description below). Other potential impacts include increased levels of noise and vibrations, air pollution, caused by dust in urban crossings on unpaved roads and automotive emissions (note: this impact may actually be positive, by reducing emissions), and the improvement in the access to the region, especially in the metropolitan area, may contribute to increased land prices.
- 5.15 Barrier Effect. Pursuant to legal provisions, the toll road users' access to alternative non-toll roads must be ensured. Regarding sections under VIAOESTE's concession, there are alternative routes that ensure the free flow of users. Specifically regarding communities located near toll plazas, VIAOESTE is enhancing secondary roads and thus enabling the transit of local residents without the collection of toll.
- 5.16 Accidents with Hazardous Cargoes. Potential spills of toxic or hazardous substances into surface waters and may somehow jeopardize water sources downstream the highway, such as Sorocamirim River, and Maria da Glória and Itupararanga Dams.

### **5.3 Bypasses**

- 5.17 The bypasses associated with SP-270 are not part of the concession contract. However, given their indirect association with the concession, a summary of the principal potential impacts is presented herein.

#### *5.3.1 São Roque*

- 5.18 Among the three alternatives analyzed for the route of the São Roque bypass, the one that represented the least interference to the physical environment and land use and occupancy was adopted. The impacts of this alternative during the construction phase relate to possible sedimentation or drainage obstruction to be intercepted by the bypass and potential pollution problems from sewage, solid waste, oil and grease generated by the construction site. The main problem observed during the operation phase is the eventual lack or deficiency of the maintenance of the drainage systems and cuttings and fills which might lead to erosive processes along the road, damaging of the pavement and spilling of dangerous cargoes with possible harm to the affected watercourses, although not affecting the water supply sources. There will also be a suppression of natural vegetation and reforested areas. The sectioning of structural roadways during the construction stage might segregate portions of the urban space due to the reduction of the access or blockage of areas liable to be urbanized.

#### *5.3.2 Brigadeiro Tobias*

- 5.19 Two route alternatives were considered for the Brigadeiro Tobias bypass. The route follows the edge (circumvents) the urban nucleus. This route passes various parts of

the urban area, crosses seven streams, and passes along highly impermeable lowland that has compacted soils from urbanization. The most significant impacts during construction are possible sedimentation or drainage obstruction to be intercepted by the new highway, water erosion, landslides, falling and rolling of blocks, besides possible minor problems with sewage pollution, solid waste and grease generated by the construction activities. During the operational phase, the most relevant risks refer to the inappropriate maintenance of the drainage systems and cuttings and fills, which might cause erosion, and damaging of the pavement. Eventual accidents from dangerous cargo spills might affect the quality of watercourses, but will not affect the water supply sources.

### 5.3.3 *Sorocaba*

- 5.20 Impacts during construction phase refer to noise and vibrations, air pollution, sedimentation of small watercourses or drainage obstruction to be intercepted by the bypass and eventual and to pollution problems by sewage, solid waste, oil and grease generated by the construction site. The main impact though refers to operation phase, where long distance traffic will be deviated from the urban area, mainly from some high-income residential areas. Some interference with local traffic will still be observed close to the intersection of this new bypass, where a university is located. DER is working on an adequate design for this section so that potential effects on local traffic can be minimized.

### 5.3.4 *Crossing of Cotia*

- 5.21 The most important impacts should occur during the construction affecting the sanitary infrastructure of the city in the section to be crossed by the lower level (below ground level) lanes, and imposed by the risks of rupture of water distribution piping, sewerage and pluvial water drainage. Another possible impact refers to the creeks and streams that may be affected by the excavated material if a proper send-off area is not previously determined. During the operation phase the eventual impacts relate to the occurrence of flooding of the lower leveled lanes because of rainstorms if the drainage system does not operate properly.
- 5.22 The highway crossing of Cotia presents possible impacts from landslide and movement of fills and sedimentation of the affluent of the Cotia River situated along the highway. The project involves the recuperation of the present bordering areas to the condition of *non-aedificandi* areas, demanding the expropriation of three one-story houses and various sheds located on the left margin of the present highway in a total of 15,200 m<sup>2</sup>, 15% of which belong to DER and 4% to existing streets.
- 5.23 The works will include devices for the transposition of vehicles and pedestrians in order to overcome the existing urban segregation and its eventual aggravation. In the area of the Municipal Market and of the Gymnasium, the access will be warranted by the elevation of the lane allowing the local traffic to flow freely.

During works, traffic restriction and short-lasting obstruction of provisory accesses may come to happen, which will be minimized through the construction, in a first phase, of the marginal lanes in to temporarily absorb the local and regional traffic.

#### **5.4 Positive Impacts / Benefits**

- 5.24 It has been estimated that the effects of future automotive emissions as compared to the current air quality will be reduced once the works are implemented by reducing the car per hour ratio in several sections of the highway system. With regard to the Sorocaba Bypass, for example, there will be a reduction of 0.03% in the cars per hour factor in this region, having as a consequence, if not reduction, at least the maintenance of current automotive emissions.
- 5.25 There will be increased ease of access to those areas near the concession highways. The improvements to be made on SP-270 will further support the real estate market by increasing the demand for condominium developments or leisure-oriented and recreational estates by the population of larger urban centers, such as São Paulo and Sorocaba. The same effect can be noticed at SP-280, where the existing traffic bottlenecking has resulted in the stagnation of this important SPMA development vector.
- 5.26 Although the construction of the São Roque, Brigadeiro Tobias and Sorocaba bypasses are not part of the concession to VIAOESTE, their operation will prevent regional traffic from interfering with local traffic in the urban area, being beneficial to both local and long distance traffic, and also promoting, pursuant to studies carried out, a 36.2% reduction in the risk of accidents in Sorocaba.
- 5.27 The crossing of Cotia urban area is not part of the concession to VIAOESTE but will have indirect effects on the highway operation. The separation of the regional traffic and the ordering of the local traffic allowed by the expansion will allow qualitative modifications in land use and occupancy, thus improving the current scenario of improvised facilities. The faster traffic flow will contribute to a higher average car speed, reducing the deterioration in air quality by automotive emissions. In addition, the section of highway constructed as a trench will contribute to reduce the effects of the transmission of highway traffic noise to those areas near the road. In sections where local and regional lanes are at-level with each other, visual, and possibly acoustic barriers will be erected. Furthermore, the works will contribute to reduce or at least to keep unchanged the level of transmission of vibrations to buildings located near the road.

### **6.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT**

- 6.1 VIAOESTE has prepared at the Bank's request an Environmental Management Plan (Projecto Basico Ambiental, PBA) for the construction and operation of the road system. The objectives of the PBA are to: (i) provide specific programs to prevent

and control environmental and social impacts, (ii) define the specific actions and the associated costs, schedule, and responsibilities for each program, and (iii) establish the basis for formulation of an Environmental Management System (EMS). A summary of the PBA mitigation and monitoring related programs is presented in Section 6.1, with the specific program for resettlement presented in Section 6.2. The costs, schedule and responsibilities for the PBA are presented in Section 6.3. The EMS and contingency plan are summarized in Sections 6.4 and 6.5, respectively.

- 6.2 Although the LI for SP-280 was originally issued in 1991, there was no requirement for submitting a RAP and it was exempt from preparing an EIA/RIMA. Regarding SP-270, the RAP was prepared by DER-SP and the team considered that it did not address environmental and social impacts and mitigation measures thoroughly. Accordingly, the Bank requested VIAOESTE to prepare Environmental Management Plan for the construction and operation of the whole project to address environmental and social impact and mitigation measures in detail.

## **6.1 Mitigation and Monitoring Measures**

- 6.3 The PBA consists of seven programs and are summarized below.

### *6.1.1 Program 1 – Characterization of Environmental Liabilities*

- 6.4 The objective of this program is to identify existing and potential environmental problems along roads under VIAOESTE concession. This program will comply with the steps and norms of the DNER manuals, by means of “registration files” for each environmental impact identified. Corrective actions will be established for the following “registrations”: (i) land use in the right of way, (ii) erosion, aggravation and slide situations, (iii) drainage affected by roads, (iv) downstream catchment and water use, (iv) industrial areas, developments, tourism and leisure accouterments and areas installed and planned, and (vi) evaluation of noise and emission of air pollutants.

### *6.1.2 Program 2 – Environmental Protection and Control*

- 6.5 This program will be implemented throughout the whole period of concession, although more intensely during the construction phase. During operation, the programs will be oriented to mainly environmental monitoring actions. Control and protection sub-programs are summarized below.
- 6.6 Geotectonic Processes Prevention and Control. This sub-program is aimed at identifying and analyzing areas of risk and their respective causes, thus preventing situations likely to threaten the road structure or surrounding areas. The risks will be based upon engineering studies and audits (i.e., Program 1) including: (i) risk of destabilization of hillsides, slopes, cuts, and embankments, (ii) development of sheet

and linear erosion processes, (iii) subsidence, (iv) slides, (v) creeps, and (vi) falling rocks.

- 6.7 Environmental Licensing and Recuperation of Degraded Areas. This sub-program will support the licensing of the following work locations and activities: (i) job sites, (ii) deposits, (iii) borrowing areas, and (iv) send-off areas. In addition, the sub-program will also arrange for the restoration of these areas after discontinuation and areas affected by the roads as identified in the environmental audit inventory. Actions will include selection of appropriate support areas and facilities, based upon environmental criteria, such giving priority to the use of aggregates from already established companies and ensuring their compliance with environmental norms and operating conditions.
- 6.8 Water Resources Pollution Control. This sub-program is related to preventing impacts of water sources located downstream of the roads. Environmental monitoring and accident prevention actions will be implemented, including: (i) control of solid waste and effluents from job sites and other facilities, (ii) proper storage and transportation of solid and industrial waste materials to licensed sanitary landfills, and (iii) control on materials storage, concrete and asphalt preparation areas, fuel storage, and handling areas. Details on aspects related to the prevention of accidents involving hazardous and dangerous cargoes are presented in section 6.4.
- 6.9 Fauna Protection. This sub-program will be performed on areas and sites in the vicinities of roads where natural vegetation is present and regional fauna live. These sites will receive protection measures to maintain their natural state, and also to avoid degrading environmental conditions, such as forest fires.
- 6.10 Air Pollution Control. This sub-program intends to monitor the concentration of major air pollutants generated at the work areas and by mobile sources, and to evaluate the effects resulting from an increased traffic flow in view of the road expansion and improvements. The following activities will be performed: (i) air quality monitoring by a mobile unit to be purchased by VIAOESTE or by a cooperation agreement with the State Agency for Pollution Control and Monitoring (CETESB), (ii) identification of major pollution affected parties and/or activities and pollution sensitive facilities, (iii) adoption of actions to minimize the impacts, such as dust control by water spraying, (iv) industrial facilities monitoring, and (v) continuous monitoring of toll booths and toll plazas.
- 6.11 Noise and Vibration Pollution Control. This sub-program consists of the monitoring of noise levels during the construction and the operation of roads. The following activities will be performed: (i) purchase of 3 (three) decibel recorders, (ii) identification of major pollution affected parties and/or activities and pollution sensitive facilities, and (iii) inspection and maintenance of the mechanical conditions of machinery, equipment, and vehicles. According to findings of the analysis, the sub-program also anticipates the use of anti-noise barriers in most susceptible areas.

### *6.1.3 Program 3 – Conservation of Vegetation and Environmentally Protected Areas*

- 6.12 This program intends to comply with compensatory environmental requirements to be defined by SMA. The program includes the need of defining an institutional cooperation agreement with SMA or a non-governmental organization in order to provide the concessionaire support for the management of an environmental conservation or protection unit existing in the region. The partners, the conservation unit, and the terms and conditions of the future agreement will be defined when the Installation License for SP-270 works is obtained.
- 6.13 Support to Environmentally Protected Areas. This sub-program consists of support to the management of a Conservation Unit as a compensatory measure. SMA related agencies will be consulted with regards to the selection of the unit. VIAOESTE has proposed the selection of Jurupará State Park. The following activities will be performed: (i) diagnosis of the park's current situation, (ii) diagnosis of local and scientific community demands, (iii) support to the formulation of zoning and management plan, and (iv) support to public disclosure of the area.
- 6.14 Riparian Vegetation. The sub-program provides the planting of vegetation at headwater and water body protection areas located in the road area of influence. The following activities will be performed: (i) development of revegetation (plantation) project, (ii) definition of vegetation phases, (iii) planting, and (iv) construction and operation of a greenhouse.
- 6.15 Landscape Recuperation. This sub-program intends to provide (i) protective, acoustic, and thermal controls, and (ii) visual and safety signaling along the roads. Parameters to be used in the landscape recovery are: (i) environmental characteristics of the region, (ii) soil and topographical conditions, (iii) visual communication requirements due to road safety, and (iv) protection against wind, noise emissions, and night glare.

### *6.1.4 Program 4 – Social Action – Resettlement and Expropriation*

- 6.16 This program intends to prevent, mitigate, and compensate for social impacts resulting from resettlements and expropriations associated with the construction works and improvements. The road work activities, such as the right of way, such as toll plazas, accesses, and inter-sections, will be designed to minimize as feasible the expropriation and resettlement. The main objective will be to minimize the interference with the population along the side of the lanes as well as the socioeconomic characterization of the population affected, and to propose other compensatory measures in addition to expropriation. A Preliminary Resettlement Plan has been designed for SP-280, which is in compliance with the Bank resettlement policy (see section 6.2 for details on resettlement plan).



- 6.17 Socioeconomic Characterization and Registration. This sub-program will be developed for SP-270. The land use and occupancy of affected areas will be mapped in addition to the socioeconomic characterization of population to be affected by means of the following procedures: (i) design projects to minimize the impacts, (ii) identification and registration of families affected including legal aspects, (iii) inventory of affected families/houses including social and economic characteristics, and (iv) analysis and diagnosis of alternatives to be adopted for expropriation or resettlement. It is believed that the resettlement of families irregularly settled in the right of way will not be necessary. However, in case of resettlement is required for SP-270 then a Resettlement Plan will be designed and implemented based on similar criteria for SP-280 resettlement and accordingly to the Bank's resettlement policy.

*6.1.5 Program 5 – Protection of Historic and Archaeological Assets*

- 6.18 This program will conduct surveys aiming at: (i) the registration and rescue of archaeological and historic sites existing in the directly impacted areas under the project, and (ii) identification of archaeological assets existing in the various municipalities in the project area.
- 6.19 Archaeological and Historic Recovery. This sub-program consists of the registration and recovery of sites in areas under the direct impact of the project to meet the specifications set forth in the Brazilian legislation pursuant to the preservation of national historic and archaeological assets. The institution in charge of the survey will be the Archaeology and Ethnology Museum of the University of São Paulo (MAE/USP).
- 6.20 Characterization and Disclosure of Regional Archaeological and Historic Assets. Among activities to be developed, emphasis will be placed on (i) registration of material remains of ancient populations, (ii) making of a video of the historic and archaeological research and (iii) publication of a book on archaeology and history of the region.

*6.1.6 Program 6 – Institutional Support to Municipalities*

- 6.21 This program intends to contribute to the institutional development of municipalities affected either directly or indirectly by the roads, including the bypasses. The first activity of the program will be the collection of data and information and the registration of public and private entities to derive benefits from projects proposed in these sub-programs.
- 6.22 Manpower Training and Development. This sub-program intends to train technicians from the municipalities in the planning and control of environment-changing activities, thus contributing to the formulation/update of city master plans and for the review/implementation of the codes of works. Anticipated activities comprise

formulation of a geotechnical map for the Region and courses and seminars on urban planning.

- 6.23 Support to Municipal Integration. This sub-program intends to foster regional development and integration by: (i) contacts with the river basin committee and possible municipal consortia in order to assess demands and the most objective way VIAOESTE can integrate and support development initiatives, (ii) support to municipal system for projects management and follow-up purposes, (iii) support to regional development seminars aimed at maximizing the tourism and industrial capacities of the area under influence, and (iv) design a publication on local economic opportunities.

*6.1.7 Program 7 – Environmental Education, Social Communication, Health and Safety*

- 6.24 This program is designed to promote and consolidate VIAOESTE integration with the community affected by the roads by promoting social communication actions demonstrating the concessionaires' environmental and responsibility. Its basic guideline encompasses information on the conservation, expansion, modernization and operation works that the concessionaire has implemented to date and will perform on roads under its management. The program will integrate all the environmental programs to be implemented by the concessionaire, stating the planned activities.
- 6.25 In addition, the program attends to accident prevention and health and safety control objectives. Anticipated actions are: (i) courses and training sessions, (ii) first aid and out-patient services, (iii) removal of accident victims, (iv) prevention and control of accidents involving hazardous cargo vehicles. See section 6.4 for additional details.

**6.2 Resettlement Plan**

- 6.26 In order to meet SMA requirements to obtain the Installation License for SP-280 marginal lanes and to comply with the Bank's resettlement policy, VIAOESTE, assisted by independent consultants, has formulated a Preliminary Resettlement Plan for the 75 families living in the right of way. After the plan is thoroughly discussed with the affected families and approval from SMA and the Municipality of Osasco, the Resettlement Plan will be finalized and implemented.
- 6.27 The existing Resettlement Plan consists of an inventory and characterization of families to be resettled, a proposal for the resettlement for these families, and an action program including defined schedule and responsibilities. The resettlement implementation is the responsibility of VIAOESTE, done in coordination with the Municipality of Osasco.
- 6.28 During the survey of affected families, the people expressed strong desires to have a lot/house within the municipality and there was no resistance expressed to the

relocation proposed. Unoccupied areas in the vicinity were assessed in order to keep to a minimum any interference with the access to public services such as schools, day care centers, community centers, public health center, public security, and mass transportation.

- 6.29 The area proposed for the resettlement is a public, currently unoccupied land adjacent to SP-280 right of way and near the *favelas* where the families currently live. The area will be divided into lots of approximately 70m<sup>2</sup>, pursuant to Municipal Law No. 2545/92 that regulates social urban developments. The lots will be equipped with water, electricity, sewerage, road system, and lighting services, and an “embryo” dwelling unit of 38m<sup>2</sup> (two rooms and a bathroom, made of masonry), will be constructed. VIAOESTE will be in charge of both urban planning and construction of houses, and will follow-up the resettlement as well. As the resettlement plan includes the construction of the houses by VIAOESTE, socially vulnerable people (aged people, single mother, etc.) who cannot construct their houses by themselves, will receive the same level of benefit under this plan. The Municipality of Osasco will donate the area and proceed with the regularization of the lots.
- 6.30 The Municipality of Osasco will grant resettled each family a Use Permit (*Permissão de Uso*) for 99 years pursuant to the Municipal Organic Law, a permission that is regulated by a Decree issued by the Executive branch. The Use Permit is free, but the permit beneficiary will be liable for tax and fiscal charges levied on the property granted. In order to keep unchanged the validity of the permit, the property will be used for residential purposes, and the renting or transfer of permit prohibited.
- 6.31 In addition, VIAOESTE will build: (i) an overpass for pedestrians over the drainage contiguous with the area and (ii) one social equipment area (e.g., sports field, center) in a plot of land nearby. The decision on which equipment is to be implemented will be made later, after a consultation with residents and the Municipality.
- 6.32 The resettlement will consist of the following phases: (i) submission of proposal to the population, (ii) organized visits to resettlement area, (iii) distribution of lots to families while preserving, wherever possible, existing neighborhood ties, (iv) meeting to discuss and approve the distribution of lots, (v) organized visits to works, (vi) consultation with the population about the construction of the social equipment in the area adjacent to the resettlement area, (vii) preliminary meeting for occupancy of dwelling units, thus commencing the preparation for relocation and conversation about new charges and family budgeting, and (viii) relocation of families (see Table 6-1 for list of actions related to the resettlement plan).
- 6.33 After the families are relocated, post-occupancy monitoring activities will be put into action, comprising the formulation of a calendar of meetings. In addition, new leaders and/or representatives will be elected. Furthermore, inspections will be made to confirm that resettled individuals have neither transferred nor rented the lot

acquired. Concurrently, educational activities will be performed focusing on maintenance and repair of houses, hygiene and health issues, maintenance and repair of green areas, consumption and control of water and electricity, further assistance in family budgeting, house pets, rational use of spaces and equipment of the new house in individual and collective terms, awareness of the expansion of the right to dwelling, health and ownership, and the implementation of a monitoring system for anticipated actions.

- 6.34 With regards to SP-270, SMA, DER-SP and VIAOESTE conducted a joint Air Survey by helicopter in late October and there was no need for resettlement identified. Although the detailed project design has not yet been completed, resettlement needs are expected to be minimal. Nonetheless, if necessary, the Bank will require that a resettlement plan will be implemented based on the same criteria for SP-280 and accordingly to the Bank's resettlement policy. (Please see Annex 3 for a description of the proposed Resettlement Program).

### 6.3 Cost, Schedule and Responsibilities

- 6.35 The table below presents a summary of costs involved in the implementation of PBA environmental programs. In addition to program costs, the estimated technical consulting services fee to achieve ISO 14001 Certification has been included. A complete cost breakdown and schedule is presented in Annex 4.

#### **COST OF PBA ENVIRONMENTAL PROGRAMS**

| <b>Programs</b>   | <b>Term</b>    | <b>Cost (R\$)</b>   |
|---|----------------|---------------------|
| 1. Characterization of environmental liabilities                    | 2 months       | 75,000.00           |
| 1. Environmental protection and control                             | 20 years       | 1,350,000.00        |
| 2. Conservation of vegetation and environmentally protected areas   | 20 years       | 850,000.00          |
| 3. Social action –resettlement                                      | 12 months      | 1,250,000.00        |
| 4. Protection of historic and archaeological assets                 | 36 months      | 370,000.00          |
| 5. Institutional support to municipalities                          | 20 years       | 550,000.00          |
| 6. Environmental education, social communication, health and safety | 20 years       | 130,000.00          |
| · <i>ISO 14001 Consulting Services</i>                              | <i>2 years</i> | <i>100,000.00</i>   |
| <b>TOTAL COST</b>   |                | <b>4,675,000.00</b> |

- 6.36 VIAOESTE is responsible for the implementation of the Environmental Management Plan. The resettlement implementation is the responsibility of VIAOESTE, done in coordination with the Municipality of Osasco. VIAOESTE will be in charge of both urban planning and construction of houses, and will follow-up the resettlement as well. The Municipality of Osasco will donate the area and proceed with the regularization of the lots.

- 6.37 Environmental mitigation and monitoring measures will be supervised and controlled by no less than three bodies: (i) VIAOESTE, by its Environmental Department and the performance of independent external audits set forth in EMS, (ii) the State Commission on Roads Concession, which will accompany and supervise the construction and operation stages, and (iii) SMA, which will set up requirements and recommendations to obtain Installation and Operation Licenses. The compliance with technical measures set forth in RAP and in other environmental studies will also be subject to SMA control throughout all the concession period.

#### **6.4 Environmental Management System**

- 6.38 The concessionaire will create an Environmental Department, subordinated to the Engineering Management, to perform the following main tasks: (i) environmental management coordination, (ii) action planning, (iii) relationship with external institutions, (iv) coordination of environmental programs, and (v) environmental control. VIAOESTE will implement an Environmental Management System (EMS) in compliance with the terms dictated by international standard ISO 14001.

#### **6.5 Contingency Plan**

- 6.39 A Contingency Plan will be designed and implemented aimed at: (i) coordinating all hazardous cargo road traffic, (ii) adopting an alarm system, (iii) identifying areas of risk, (iv) installing control stations at strategic sites, (v) installing communication systems and signaling devices, (vi) implementing controlled parking areas for dangerous cargo vehicles, (vii) training teams in traffic control and impacts minimization, (viii) preparing a “Manual for Operation under Emergency Situations”, (ix) accompanying the traffic of dangerous cargoes in sections considered critical, and (ix) periodical inspection and maintenance of the draining system in dangerous cargo parking areas.
- 6.40 Regarding hazardous cargo, Viaoeste’s role is to monitor the hazardous cargo transportation within its highways and in case of accident, support the responsible entities, such as the Police Department, the Fire Department and the State the Environmental Department (CETESB). Equipment will be prepared by those responsible entities. However, VIAOESTE’s own personnel will be trained to conduct preventive measures and in case of accidents, conduct traffic control and communicate with those entities. The contingency plan related to hazardous cargo includes preparation of preventive measures such as identification of risk area, communication measure with the responsible entities and training program for both responsible entities and VIAOESTE’s staff. Although this contingency plan is expected to be to be sufficient, the Bank will require the presentation of final contingency plan to assure a proper implementation of measures indicated in PBA.

## **VII. PUBLIC CONSULTATION**

- 7.1 With regards to proposed improvements in SP-270, pursuant to the environmental legislation of the State of São Paulo, in March 1997 a notice was published in wide circulation newspapers announcing that the Preliminary Environmental Report (RAP) for the highway expansion works (exclusive of São Roque, Brigadeiro Tobias and Sorocaba bypasses) had been submitted to SMA for analysis, was available for public review, and that the thirty-day period to receive observations in writing about the project had commenced.
- 7.2 In September 1998 associated with the submittal to SMA of a revised RAP for SP-270 expansion works (inclusive of Brigadeiro Tobias, São Roque, Sorocaba and Cotia bypasses), a new notice was published in wide circulation in both state and regional (São Roque) newspapers. The notice stated the RAP was available for public review and that the thirty-day period to receive observations in writing about the project had commenced.
- 7.3 VIAOESTE will make available to the municipalities affected by the works, associated with SP-270, copies of RAP and summary of the PBA (Environmental Management System) by November 10, 1998. This disclosure will allow interested and affected parties specific information on the environmental effects and planned mitigation and monitoring measures.
- 7.4 A technical information meeting related to SP-270 road expansions and bypasses will be held in Sorocaba on November 12, 1998. The meeting is similar to a public hearing, where clarifications about the project and about the environmental effects will be provided to the public. SMA will schedule this meeting with CONSEMA's support.
- 7.5 With regards to SP-280, VIAOESTE will make available to the general public a summary of the Environmental Management Plan (PBA) by November 10, 1998. This disclosure will allow interested and affected parties specific information on the environmental effects and planned mitigation and monitoring measures.
- 7.6 Further to these actions, VIAOESTE has developed and will implement a social communication program (see section 6.1 for details).

## **8.0 RECOMMENDATIONS**

- 8.1 The IDB (Bank) will require, as part of the Loan Contract, that VIOESTE (Borrower) comply with the following: (i) all applicable environmental, health and safety Brazilian regulatory requirements, (ii) all requirements associated with any environmental, health and safety related permits, authorizations or licenses that apply

to Project, (iii) all environmental, health and safety aspects of the Concession Contract, (iv) all components of the Environmental Management Plan (Projeto Basico Ambiental), (v) all components of the Resettlement Plan for SP-280 expansion in Osasco and for SP-270, if any, (vi) implementation of all actions and requirements in any project related environmental, health and safety document, including without limitation, project health and safety plans and procedures, contingency plan, and (vi) the applicable environmental and social IDB policies and guidelines.

8.2 The licensing requirements of the Bank will be different between SP-270 and SP-280 according to their history of licensing acquisition and current licensing status as described in section 3.3, compliance status. As for the resettlement plan, it has already been negotiated and finalized and will be submitted to SMA shortly. The Bank will require the presentation of the final resettlement plan before financial closing.

8.3 Prior to project financial closure, the Borrower must fulfill the following conditions:

1. Submit evidence of governmental issuance of the Preliminary License (LP) for road segment SP-270.
2. Submit evidence of governmental issuance of the Installation License (LI) for road segment SP-280 expansion in Osasco.
3. Submit the finalized Resettlement Plan, subject to Bank approval, for the SP-280 expansion work in Osasco, including a guarantee that the plan will be fully implemented and a current status of all resettlement actions that have been performed at the time of financial closure.
4. Submit the finalized Environmental Management Plan (PBA) and a status of implementation at the time of financial closure.
5. Present a proposed Project Supervision Plan, subject to IDB approval, which will include the specific methods (e.g., use of independent environmental consultants, environmental health and safety audits and inspections) to be implemented to ensure all environmental and social measures and programs for the Project are completely and properly implemented by all responsible parties.

8.4 Prior to first disbursement, the Borrower must fulfill the following conditions:

1. Present a report on all expropriation and resettlement related activities associated with the SP-270, including results of a complete survey on persons/buildings located in the SP-270 right-of-way which may require expropriation and/or resettlement and a plan to properly resolve the situation, including specific actions, estimated cost, time schedule, and responsibilities.
2. Present a project Contingency Plan for the Construction Phase (e.g., spill and emergency response procedures, etc.), including assurances that adequate resources will be provided to ensure the plan will be fully implemented.

- 8.5 The following conditions must be fulfilled by the Borrower prior to each disbursement:
1. Certification of compliance by with all environmental and social loan requirements.
  2. Description of any non-compliance with any environmental and social loan requirement and an action plan to correct such non-compliance.
  3. Description of any known environmental and social liability, including without limitation environmental claim, or material compliant, or unforeseen environmental, health or safety impact or risk.
- 8.6 Upon completion of the resettlement actions for the expansion of SP-280 in Osasco, the Borrower shall submit a Final Report on Resettlement, which will be prepared by Independent Consultant satisfactory to the Bank. The report will include, at minimum, the following:
1. Assessment of resettlement actions completed, and in particular, compliance with the project Resettlement Plan;
  2. Description of any material deviation from the Resettlement Plan, including a brief technical description and major reasons for such changes;
  3. Description of any existing or anticipated problem or material complaints.
- 8.7 After beginning of the full the commercial operation of the SP-280 and SP-270, and no later than 180 days, the Borrower shall submit a Final Report on the Construction Component of Environmental and Social Mitigation and Monitoring Measures for each road segment, including the following:
1. Certification by the Borrower that the project has successfully implemented and complied with all environmental and social requirements;
  2. Any material deviation from the original construction plan, including a brief technical description and major reasons for such changes, as well as any adjustment to the relevant environmental and social measures that have been taken;
  3. Description of any existing or anticipated environmental or social liability, risk or non-compliance; and
  4. Copies of any major environmental or social report or document prepared in order to satisfy regulatory requirements, except those already submitted with the reports during construction period.
- 8.8 During the term of the loan, the Borrower must prepare and submit an Annual Environmental and Social Compliance Report, which will be due 60 days after the close of each Fiscal Year. The report must include, at a minimum, the following:
1. Certification that the Company is complying with all environmental and social loan requirements;

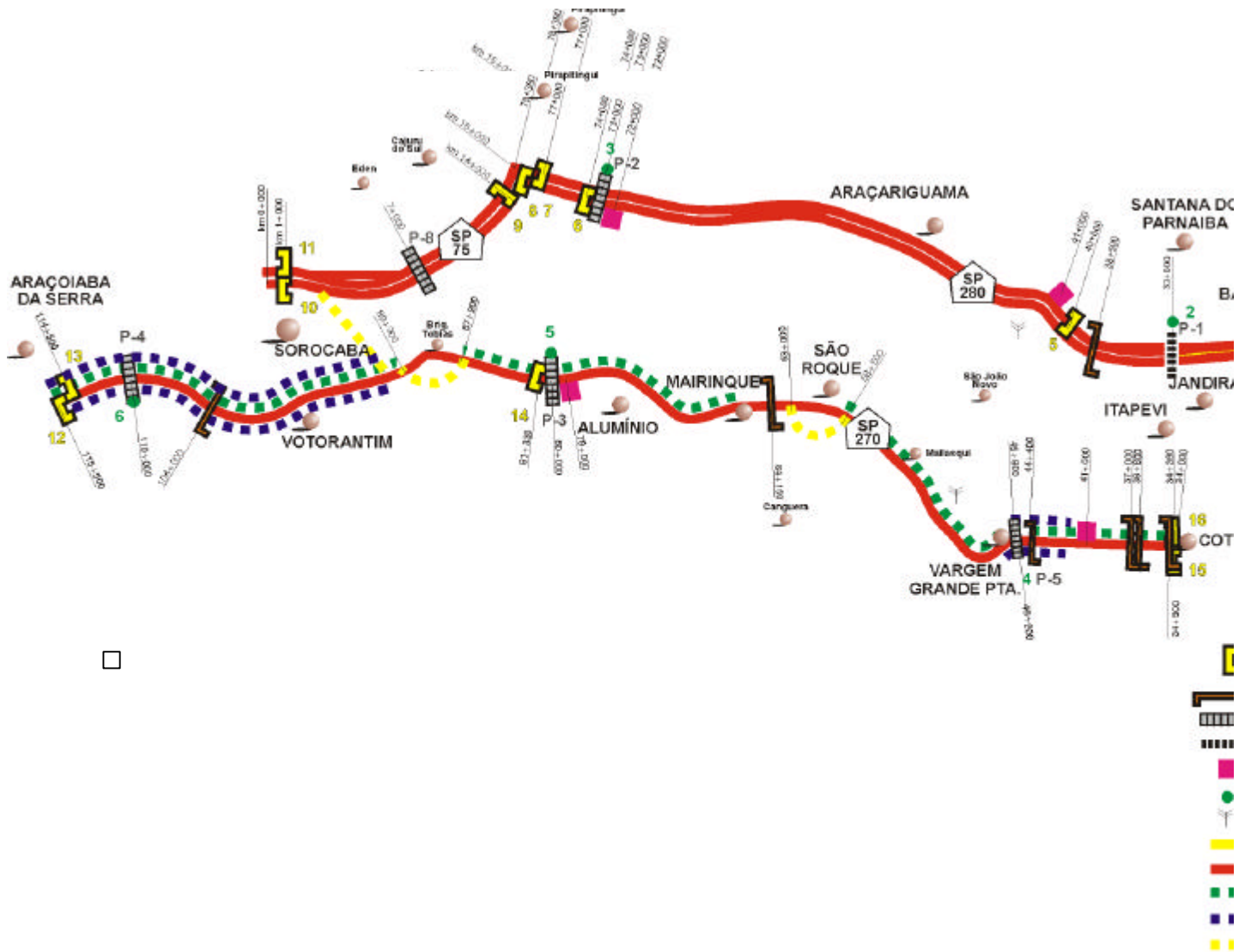


2. Description of any material non-compliance with any environmental and social loan requirement that occurred and a description of measures taken to correct the non-compliance.
3. Description of any changes in the company's operations which may have a material environmental or social effect, the reasons for such changes and any actions taken to mitigate the impact of such change.
4. Description of any material environmental or social problem (such as accident, unplanned event, etc.) and a description of the actions taken to resolve the problem and the measures taken to prevent the event from occurring in the future.
5. Description of any contact by a third party (including governmental agency, public, non-governmental organization, company employee, etc.) regarding environmental, social or health and safety issue.
6. Description of planned environmental and social related activities to be performed during the next year, including estimated cost, schedule, and responsibility, including any environmental impact assessment to be developed.
7. Copy of any environmental and social document or report written to comply with any governmental regulatory requirements.

8.9 During the term of the loan, the Borrower must comply with the following requirements:

1. Consult with the Bank before implementing any action, which will have a material environmental or social impact.
2. Provide written notification, within 30 days after the Company becomes aware, of any material non-compliance with environmental and social loan requirements, environmental health or safety material affect, environmental claim, or material complaint related to environment health or safety related to the Project or Properties, including a description of the situation (extent, magnitude, impact, etc.), the cause, proposed corrective or remedial actions, actions taken, and proposed schedule for future actions.
3. Implement an Environmental Management System that is consistent with ISO 14001.
4. Ensure compliance by construction contractors with the all environmental and social requirements.
5. If any resettlement actions are required, then the required actions will fully comply with the Bank's Policy on Involuntary Resettlement (dated August 1998).

# ANNEX 1: LOCATION MAP OF CASTELLO-RAPOSO TOLL ROAD



## ANNEX 2-1: IMPACTOS AMBIENTAIS POTENCIAIS (SP-280, SP-270 E SP-075) - FASE DE IMPL

| IMPACTO POTENCIAL   | DESCRIÇÃO DO IMPACTO   | QUANTITATIVOS DO IMPACTO  | MEDIDAS MITIGADORAS  |
|---|--|---|--|
| Alteração da Qualidade do Ar  | O trânsito pesado e a movimentação de máquinas, equipamentos e veículos provocam o aumento das emissões de M.P. e gases da combustão para a atmosfera prejudicando a qualidade do ar.                          | <ul style="list-style-type: none"> <li>Não há dados específicos sobre as rodovias, mas estudos apontam uma redução na ordem de 0,9% com a melhoria do tráfego.</li> <li>Durante as obras a poluição deverá aumentar</li> </ul>            | <ul style="list-style-type: none"> <li>Quantificação prélimin</li> <li>Umidificação do solo terra que servem a obra.</li> <li>Monitoramento da qu</li> <li>Fiscalização da emissi</li> </ul> |
| Aumento da emissão de ruídos e vibrações junto a áreas urbanizadas e ao longo da rodovia    | O funcionamento dos motores e equipamentos provoca aumento do nível de ruído existente ao longo da rodovia e em áreas urbanizadas.   | <ul style="list-style-type: none"> <li>Não há dados específicos sobre as rodovias, mas estudos apontam uma redução na ordem de 0,9% com a melhoria do tráfego.</li> </ul>   | <ul style="list-style-type: none"> <li>Monitoramento do ru</li> <li>Se for necessário, ca de barreira acústica</li> <li>Fiscalização de máqu</li> </ul>                                      |
| Aumento do lançamento de efluentes líquidos (Canteiros de Obras, Oficinas, esgoto, lavagem) | A geração de efluentes líquidos como os esgotos sanitários do canteiro de obra, os óleos de veículos e as águas de lavagem alteram a qualidade da água e do solo   | <ul style="list-style-type: none"> <li>Não há quantidades específicas. Deverão ser monitorados os 2 canteiros e o CCO</li> </ul>  | <ul style="list-style-type: none"> <li>Sistema de tratamen ABNT.</li> <li>Caixa de separação de</li> <li>Disposição adequada</li> </ul>  |
| Aumento do lançamento de resíduos sólidos (Canteiros de Obras, entulho)                     | A geração de resíduos sólidos devido às atividades nos Canteiros de Obras e de parte do material removido (entulho) altera a qualidade do solo e pode afetar os cursos d'água.                                 | <ul style="list-style-type: none"> <li>Não há quantidades específicas</li> </ul>  | <ul style="list-style-type: none"> <li>Disposição adequa sanitário)</li> <li>Utilização, se possíve da estrada ou disposi sanitário)</li> </ul>  |
| Risco de contaminação de solos e cursos d'água (acidentes)                                  | Durante a execução da obra, os desvios podem acarretar em aumento de risco de acidentes com cargas perigosas, com consequente possível contaminação do solo e das águas.                                       | <ul style="list-style-type: none"> <li>Dados preliminares informam que durante 1 semana de setembro houve uma média de 77 transporte/dia de cargas perigosas, sendo que 64,9% eram de combustíveis e 35% de produtos químicos.</li> </ul> | <ul style="list-style-type: none"> <li>Sinalização dos desvi</li> <li>Redutor de velocidade</li> <li>Plano de contingência</li> <li>Identificação de área</li> </ul>                         |
| Intensificação de processos erosivos, de assoreamento e escorregamentos                     | A movimentação de terra, com cortes, aterros e bota-foras, proporciona processos erosivos que, atingindo o curso d'água, provocam o seu assoreamento   | <ul style="list-style-type: none"> <li>Não há quantitativos- medidas estruturais e não estruturais de mitigação do processo.</li> </ul>   | <ul style="list-style-type: none"> <li>Sistema de drenagem</li> <li>Definição da época terra (estiagem)</li> </ul>   |
| Impacto sobre a fauna   | O atropelamento e o deslocamento da fauna quando da remoção da vegetação representam um impacto sobre este elemento.   | <ul style="list-style-type: none"> <li>Em um período de 6 meses de operação foram capturados aproximadamente 20 animais</li> </ul>  | <ul style="list-style-type: none"> <li>Sinalização em loca travessia de animais</li> </ul>   |
| Retirada de vegetação e alteração de habitats   | A remoção da vegetação provoca alteração nos habitats e o desequilíbrio das funções do ecossistema natural.  | <ul style="list-style-type: none"> <li>A retirada da vegetação de maior expressão deverá ser feita nas obras da Raposo Tavares, bem como nos serviços de capina e poda das áreas lindeiras às rodovias</li> </ul>                         | <ul style="list-style-type: none"> <li>Remoção somente plantio compensatório</li> <li>Adoção de área</li> <li>Viveiro</li> </ul>   |
| Degradação de áreas (canteiros, pedreiras, jazidas, bota-foras, etc.)                       | A apropriação de área para a implantação do empreendimento restringe a ocupação do solo. A utilização de materiais como das jazidas e pedreiras gera uma redução na disponibilidade destes materiais no local. | <ul style="list-style-type: none"> <li>Não há quantitativos definitivos</li> <li>Estima-se pelo menos: 2 canteiros 20 bota-foras e 6 caixas de empréstimo</li> </ul>  | <ul style="list-style-type: none"> <li>Jazidas e pedreiras obra já em uso.</li> <li>Escolha de local adequ utilizando critérios amb</li> <li>Recuperação final</li> </ul>                    |

| <b>IMPACTO POTENCIAL</b>   | <b>DESCRIÇÃO DO IMPACTO</b>   | <b>QUANTITATIVOS DO IMPACTO</b>   | <b>MEDIDAS MITIGADORAS</b>  |
|--|---|---|---|
| Interferências com áreas rurais e urbanas (desapropriações, remoções, etc.)          | As implantações da duplicação e das marginais poderão acarretar em remoções e/ou desapropriações em áreas de trevo de acesso, ocupação irregular em faixa domínio.  | <ul style="list-style-type: none"> <li>• 75 famílias - SP 280</li> <li>• desconhecido na SP -270</li> </ul> | <ul style="list-style-type: none"> <li>• Indenização justa existente.</li> <li>• Adequação de projeto</li> <li>• Características sócio-culturais</li> <li>• Programa de reassentamento</li> </ul> |
| Interferências com infra-estruturas (drenagens, instalações urbanas, etc.)           | Durante a implantação da duplicação haverá necessidade de realocação de infra-estruturas existentes tanto as da própria rodovia como infraestrutura urbana, causando temporariamente transtornos.   | <ul style="list-style-type: none"> <li>• Aproximadamente 32 dispositivos</li> </ul>                         | <ul style="list-style-type: none"> <li>• Indenização justa existente.</li> <li>• Adequação de projeto</li> <li>• Características sócio-culturais</li> <li>• Programa de reassentamento</li> </ul> |
| Perturbações temporárias no tráfego local e aumento do risco de acidentes            | A necessidade de desvios e a própria movimentação das máquinas e veículos associados à implantação da duplicação causará transtornos no tráfego local, podendo aumentar aumento no risco de acidentes.  | <ul style="list-style-type: none"> <li>• Não há quantitativos.</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Treinamento de prestadores de serviços e</li> <li>• Manuais de procedimentos ambientais</li> <li>• Ações de educação da comunidade.</li> </ul>           |
| Aumento da oferta de empregos diretos e indiretos                                    | A contratação de pessoal para a implantação da duplicação representa um aumento na oferta de empregos diretos e a demanda por serviços e materiais de indiretos, representando um impacto positivo nesta fase.  | <ul style="list-style-type: none"> <li>• Não há quantitativos.</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Apoio ao treinamento</li> <li>• Ações de educação da comunidade.</li> </ul>  |
| Interferências com sítios arqueológicos e com patrimônio histórico                   | A movimentação de terras, principalmente as relacionadas à corte de terreno afetam os sítios arqueológicos existentes na faixa. As informações contidas nestes sítios podem representar uma informação importante no entendimento das ocupações pretéritas. | <ul style="list-style-type: none"> <li>• Não há quantitativos.</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Desgaste dos vestígios</li> <li>• Recuperação do Patrimônio</li> <li>• Cadastramento e registro</li> <li>• Caracterização regional</li> </ul>            |
| Interferências com áreas protegidas (APP, APM, APA, etc.)                            | A duplicação e a construção das marginais cortarão áreas com restrição de uso como APP. Estas áreas podem ser ocupadas quando existe a finalidade de uso público, como é o caso.  | <ul style="list-style-type: none"> <li>• APP - 70ha.</li> </ul>   | <ul style="list-style-type: none"> <li>• Apoio/manutenção de áreas protegidas</li> <li>• Recuperação das APPs</li> <li>• Medidas compensatórias</li> </ul>  |
| Interferência com planos diretores e legislação de uso e ocupação do solo municipais | A duplicação e a construção de marginais interferirá na dinâmica dos municípios da área de influência, principalmente os que possuem suas áreas urbanas na área de intervenção.   | <ul style="list-style-type: none"> <li>• Não há quantitativos.</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Integração com o Plano Diretor</li> <li>• Apoio Institucional.</li> </ul>  |

## ANNEX 2-2: IMPACTOS AMBIENTAIS POTENCIAIS (SP-280, SP-270 E SP-075) - FASE

| <b>HIPÓTESE DE IMPACTO</b>   | <b>DESCRIÇÃO DO IMPACTO</b>  | <b>MEDIDAS MITIGADORAS</b>  | <b>PROGRAMA AMBIENTAL</b>  |
|--|--|---|--|
| Alteração da Qualidade do Ar   | Com a melhoria do tráfego, favorece-se a dispersão dos particulados, resultando em uma melhoria da qualidade do ar.  | <ul style="list-style-type: none"> <li>• Instalação de medidores de qualidade do ar</li> <li>• Fiscalização da emissão de gases pelos veículos</li> </ul>   | <ul style="list-style-type: none"> <li>• Sub-programa Qualidade do Ar e</li> </ul>                                     |
| Aumento da emissão de ruídos e vibrações junto a áreas urbanizadas e ao longo da rodovia | Com o aumento do volume de veículos/hora, obtém-se um acréscimo do ruído emitido pela rodovia.   | <ul style="list-style-type: none"> <li>• Monitoramento dos níveis de ruído, principalmente nas áreas mais urbanizadas.</li> </ul>   | <ul style="list-style-type: none"> <li>• Sub-programa Sonora</li> </ul>  |
| Risco de contaminação de solos e cursos d'água (acidentes)                               | Melhorando as condições de trafegabilidade consegue-se reduzir o número de acidentes, diminuindo o risco de contaminação.  | <ul style="list-style-type: none"> <li>• Fiscalização constante da inspeção de tráfego.</li> </ul>  | <ul style="list-style-type: none"> <li>• Sub-programa Hídrica</li> <li>• Programa Co Ed. Ambiental</li> </ul>          |
| Impacto sobre a fauna  | Com a instalação da duplicação e da divisão com a barreira rígida ( tipo New Jersey - SP 270 ), há maior probabilidade de atropelamento, uma vez que os animais não conseguem atravessar a pista.              | <ul style="list-style-type: none"> <li>• Fiscalização constante da inspeção de tráfego para retirada de animais.</li> </ul>   | <ul style="list-style-type: none"> <li>• Sub-programa</li> </ul>   |
| Retirada de vegetação e alteração de habitats  | Manutenção da faixa de domínio com a capina de vegetação Herbácea, e eventual poda de galhos que afetem a segurança da estrada.  | <ul style="list-style-type: none"> <li>• Deposição de material de poda e capina em usinas de compostagem.</li> <li>• Plantio compensatórios em caso de poda drástica de indivíduos arbóreos.</li> </ul>   | <ul style="list-style-type: none"> <li>• Sub-programa Áreas Degradadas</li> <li>• Sub-programa das Rodovias</li> </ul> |
| Melhoria do Escoamento de Produção   | Com o melhor acesso entre os municípios e os centros consumidores, obtém-se um menor tempo de transporte de produtos, favorecendo as indústrias da área de influência direta e indireta.                       | <ul style="list-style-type: none"> <li>• Diagnóstico das Demandas Regionais</li> </ul>  | <ul style="list-style-type: none"> <li>• Apoio Instituci</li> </ul>  |
| Desenvolvimento Urbano /Industrial   | Com o advento da melhoria do escoamento da produção, favorece-se a implantação de novas indústrias e serviços na região.   | <ul style="list-style-type: none"> <li>• Diagnóstico das Demandas Regionais</li> <li>• Fomento aos setores produtivos e ao turismo.</li> </ul>  | <ul style="list-style-type: none"> <li>• Apoio Instituci</li> </ul>  |
| Dinamização da economia  | Com a melhoria do acesso entre os municípios afetados, para Capital e restante do Estado, há um favorecimento para instalação de novas indústrias e serviços na região, promovendo um aquecimento da economia. | <ul style="list-style-type: none"> <li>• Diagnóstico das Demandas Regionais</li> <li>• Incentivo ao planejamento de desenvolvimento sustentável</li> <li>• Apoio e treinamento e capacitação de pessoal.</li> <li>• Fomento aos setores produtivos e ao turismo.</li> </ul> | <ul style="list-style-type: none"> <li>• Apoio Instituci</li> </ul>  |
| Aumento da oferta de empregos diretos e indiretos  | Com a instalação de novas indústrias e serviços promovido pelo aquecimento da economia tem-se um aumento diretamente proporcional de empregos diretos/indiretos.   | <ul style="list-style-type: none"> <li>• Apoio ao treinamento e capacitação pessoal</li> </ul>  | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> </ul>  |

| <b>HIPÓTESE DE IMPACTO</b>                            | <b>DESCRIÇÃO DO IMPACTO</b>   | <b>MEDIDAS MITIGADORAS</b>  | <b>PROGRAMA AMBIENTAL</b>  |
|---|---|---|--|
| Indução à ocupação                                    | Com o aumento da oferta de empregos, cresce a procura de pessoas pela região, aumentando a velocidade de ocupação da área afetada, e promovendo um aumento da população e arrecadação.  | <ul style="list-style-type: none"> <li>• Incentivo ao planejamento de desenvolvimento sustentável</li> </ul>  | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> </ul>                          |
| Aumento da demanda de serviços sociais                | O aumento da população gera a necessidade da ampliação de serviços essenciais, como aumento da rede hospitalar, educacional, etc.   | <ul style="list-style-type: none"> <li>• Diagnóstico das demandas regionais</li> </ul>  | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> </ul>                          |
| Qualidade de vida                                     | Devido ao aumento de empregos, população, serviços sociais, prestação de serviços, entre outros; promove-se na área afetada um acréscimo de opções sócio-econômicas para os moradores, resultando em uma melhoria da qualidade de vida. | <ul style="list-style-type: none"> <li>• Incentivo ao planejamento e desenvolvimento sustentável</li> <li>• Ações de Educação Ambiental para a comunidade.</li> </ul>       | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> </ul>                          |
| Melhoria no tempo de trânsito                         | Implantando-se melhorias na infraestrutura das pistas, há uma melhor trafegabilidade e diminuição no tempo de viagem.   |   | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> </ul>                          |
| Melhoria do tráfego e redução de acidentes            | Com a duplicação e seus serviços, há uma melhoria do tráfego, que também subsidia uma diminuição no número de acidentes.  |   | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios</li> <li>• Programa de E</li> </ul> |
| Aumento da arrecadação municipal                      | Com o aumento da ocupação no município obtém-se uma maior arrecadação de impostos para o município, favorecendo o desenvolvimento da região.  | <ul style="list-style-type: none"> <li>• Apoio ao treinamento e capacitação pessoal</li> </ul>  | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios.</li> </ul>                         |
| Intervenção em APP (capina e poda)                    | Necessidade de capina e poda em áreas de preservação permanente, caracterizadas por drenagens que atravessam o corpo estradal.  | <ul style="list-style-type: none"> <li>• Deposição do material de poda e capina em usinas de compostagem.</li> <li>• Média compensatória por intervenção em APP.</li> </ul> | <ul style="list-style-type: none"> <li>• Programa Pr Ambientalmente vegetação</li> </ul>                 |
| Incentivos a capacitação institucional dos municípios | A VIAOESTE possui a preocupação de contribuir para a capacitação dos funcionários municipais, através de programas com cursos formativos e de reciclagem, entre outros.   |   | <ul style="list-style-type: none"> <li>• Sub-programa aos Municípios.</li> </ul>                         |

### ANNEX 3: QUADRO SÍNTESE DAS AÇÕES DE REASSENTAMENTO

| AÇÕES  | TRABALHO A SER DESENVOLVIDO  | RECURSOS MATERIAIS  |
|--|--|---|
| 1.<br>Estudo – Pesquisa  | <ul style="list-style-type: none"> <li>• Cadastramento das famílias.</li> <li>• Selagem das unidades habitacionais</li> </ul>  | <ul style="list-style-type: none"> <li>• Ficha de caracterização sócio-econômica.</li> <li>• Fichas adesivas para selagem da UHS.</li> <li>• Cartão de Cadastramento (fornecido ao morador)</li> <li>• 02 veículos</li> </ul> |
| 2.<br>Diagnóstico e Relatório Integrado  | <ul style="list-style-type: none"> <li>• Tabulação dos dados do Cadastramento</li> <li>• Análise dos dados</li> <li>• Caracterização da população e da área de intervenção.</li> <li>• Diagnósticos de alternativas</li> </ul>   |   |
| 3. Apresentação das Propostas para a população em conjunto com liderança da área | <ul style="list-style-type: none"> <li>• Preparação de material para reunião.</li> <li>• Divulgação e entrega de convites para a reunião.</li> <li>• Apresentação das propostas por favela.</li> <li>• Discussão das alternativas.</li> <li>• Pré opção das alternativas x condição financeira.</li> </ul> | <ul style="list-style-type: none"> <li>• Peças visuais destinadas às reuniões.</li> <li>• Convites.</li> <li>• Material de divulgação.</li> <li>• Projetos das U.H.s.</li> </ul>  |
| 4.<br>Visitas às Áreas de Reassentamento.  | <ul style="list-style-type: none"> <li>• Elaboração de calendário de visitas.</li> <li>• Acompanhamento e orientação às famílias.</li> <li>• Viabilização de transporte para as visitas</li> </ul>   | <ul style="list-style-type: none"> <li>• 04 veículos (peruas)</li> </ul>  |
| 5.<br>Seleção das Famílias por alternativas / opção                              | <ul style="list-style-type: none"> <li>• Listagem das famílias por opção.</li> </ul>   |   |
| 6.<br>Assembleia para Aprovação  | <ul style="list-style-type: none"> <li>• Aceitação das famílias para as alternativas apresentadas.</li> <li>• Confirmação da opção.</li> </ul>   | <ul style="list-style-type: none"> <li>• Material fotográfico.</li> <li>• Declaração de aceitação da proposta.</li> </ul>   |
| 7. Acompanhamento do Processo Construtivo  | <ul style="list-style-type: none"> <li>• Elaboração de calendário de visitas.</li> <li>• Visitas periódicas às áreas de reassentamento, com a demanda já estabelecida nas assembleias.</li> <li>• Viabilização de transporte.</li> </ul>   | <ul style="list-style-type: none"> <li>• 04 veículos (peruas)</li> </ul>  |

| <b>AÇÕES</b>  | <b>TRABALHO A SER DESENVOLVIDO</b>   | <b>RECURSOS MATERIAIS</b>   |
|---|--|---|
| 8. Equipamentos Sociais                                 | <ul style="list-style-type: none"> <li>• Levantamento dos equipamentos sociais no entorno das áreas de reassentamento.</li> <li>• Averiguação de capacidade de absorção das demandas de cada área.</li> <li>• Início de negociação dessa absorção</li> </ul>   | <ul style="list-style-type: none"> <li>• 01 veículo</li> </ul>  |
| 9. Preparação para Ocupação das Unidades Habitacionais. | <ul style="list-style-type: none"> <li>• Preparação de material para reuniões.</li> <li>• Reuniões para o estabelecimento de vizinhanças.</li> <li>• Elaboração de quadro de assentamento das áreas.</li> <li>• Orientação sobre documentos necessários.</li> <li>• Preparação para as mudanças.</li> <li>• Discussão dos novos encargos x planejamento econômico-familiar.</li> <li>• Trabalho educativo (1)</li> </ul> | <ul style="list-style-type: none"> <li>• Peças visuais destinadas às reuniões.</li> <li>• Material de divulgação das reuniões.</li> <li>• Projetos de implantação de cada área.</li> <li>• Folhetos e/ou cartilhas de esclarecimentos.</li> </ul> |
| 10. Mudança das Famílias                                | <ul style="list-style-type: none"> <li>• Elaboração de calendário de mudanças.</li> <li>• Viabilização de caminhões e operacionais.</li> <li>• Controle e organização da execução das mudanças.</li> <li>• Controle e recepção da chegada das famílias nas áreas de reassentamento.</li> <li>• Check-list das unidades habitacionais em conjunto com novo morador.</li> </ul>  | <ul style="list-style-type: none"> <li>• 01 Caminhão para cada 02 famílias.</li> </ul>  |



| AÇÕES                          | TRABALHO A SER DESENVOLVIDO   | RECURSOS MATERIAIS   |
|--------------------------------|---|--|
| 11. Monitoramento Pós Ocupação | <ul style="list-style-type: none"> <li>• Elaboração de calendário de reuniões.</li> <li>• Eleição de novas lideranças / representantes.</li> <li>• Preparação de material para as reuniões.</li> <li>• Trabalho educativo enfocando.</li> <li>• Conservação e manutenção das UHs.</li> <li>• Higiene e saúde.</li> <li>• Conservação e manutenção de áreas verdes (consciência ecológica)</li> <li>• Consumo e controle de água e luz.</li> <li>• Reforço das orientações de planejamento economicamente familiar.</li> <li>• Lixo (acondicionamento).</li> <li>• Animais domésticos.</li> <li>• Utilização racional dos espaços e equipamentos da nova moradia nos aspectos individuais e coletivos.</li> <li>• Estabelecimento de normas e organização condominial.</li> <li>• Conscientização da ampliação dos (direito à: moradia, saúde e propriedade).</li> <li>• Implantação de sistema de monitoramento para as ações previstas.</li> </ul> | <ul style="list-style-type: none"> <li>• Peças visuais destinadas às reuniões.</li> <li>• Material de divulgação.</li> <li>• Folhetos e/ou cartilhas educativas</li> </ul> |

**Please insert (ANNEX 4: Schedule and Costs for Environmental Activities) here.**