

# **INTER-AMERICAN DEVELOPMENT BANK**



***BRAZIL***

***RODOANEL OESTE CONCESSION  
(BR-L1228)***

***ENVIRONMENTAL AND SOCIAL MANAGEMENT REPORT  
(ESMR)***

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**BR-LI228 Rodoanel Oeste Concession**  
**Environmental and Social Management Report (ESMR)**

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## I INTRODUCTION

- 1.1 The 32-kilometer *Rodoanel Mário Covas - Trecho Oeste* (“Rodoanel Oeste”) - is an existing freeway<sup>(1)</sup> located on the outskirts of the Metropolitan Region of São Paulo (“MRSP”), in Brazil (see **Annex 1: Project Location Map**). It has mainly been developed to alleviate the traffic, particularly that of trucks and buses, coming into or crossing the Metropolitan Area through its essentially radial road network. The first segment of the Rodoanel Oeste has been under operation by a state-owned company (“DERSA”) since December 2001 and the whole section since October 2002. As part of the State of São Paulo Program of Highway Concessions, the government decided in 2007 to award the concession for operation of the Rodoanel Oeste to a private company, through an international public bidding process. The concession has been awarded to *Concessionária Rodoanel Oeste S.A.* (the “Concessionaire” or the “Company”) in March 2008, and the Company took over operation in June 2008.
- 1.2 The Bank has been approached regarding potential financing for the works that are necessary (upgrade and expansion) for the operation of the freeway, pursuant to the award of a 30-year Concession Agreement (the “Concession” or the “Project”) to a private company, under the responsibility of the Government of the State of São Paulo (“GoSP” or the “Granting Authority”) through the *Agência de Transportes do Estado de São Paulo* (“ARTESP”). The Project represents the first highway development to be launched as part of the GoSP’s second generation of State toll road concessions.
- 1.3 The Concession does not involve the construction of any new highway segment. Nevertheless, to fulfill the requirements of the terms of the Concession a limited amount of works will be necessary to be undertaken by the Company. The main civil works foreseen under the Concession will be mostly developed inside the right-of-way (“ROW”) of the Rodoanel and essentially limited to: (i) construction of new frontage or service roads on both sides of a segment of the Rodoanel; (ii) improvement in existing frontage roads; (iii) construction of new lanes and new acceleration and deceleration lanes on some highway segments; (iv) construction of toll plazas; (v) construction of six additional pedestrian overpasses; and (vi) installation of acoustic barriers on some segments (four barriers of 1 km each). Some of the works will have to be implemented at the beginning of the Concession, others, like the construction of new frontage roads, will need to be initiated 25 months from the start of the Concession.
- 1.4 *Concessionária Rodoanel Oeste S.A.* is comprised by *Companhia de Concessões Rodoviárias - CCR S.A.*, with 95% interest and *Encalço Construções Ltda.*, with the remaining 5%. This Concessionaire was formed with the sole purpose of addressing the concession’s activities and won, in March 2008, the bid related to the operation of the section in question, by presenting a proposal with the lowest toll rate (R\$ 1.168 or around USD 0.60) in comparison with the remaining rates presented, a negative premium of 61% in relation to the cap amount of R\$ 3.00 defined by the GoSP.
- 1.5 The Concession started on June 01, 2008, tolling initiated on December 17, 2008, and the Concessionaire is currently undergoing the initial stages of structuring the company, hiring staff and defining technical procedures, including those related to the environmental, social,

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(1) **Freeway** - means a divided arterial highway with full control of access and with grade separations at intersections.

health and safety issues of its operations. One of IDB's recommendations is to develop and effectively implement a structured and organized Environmental, Social, Health and Safety Management System applicable to the whole Concessionaire to ensure that the operation of Rodoanel Oeste complies with proper standards and with the Operational Policies enforced by IDB.

- 1.6 In view of the relatively limited magnitude of the construction works and the fact that they will essentially be developed inside the ROW of the freeway, most of the potential negative environmental and social impacts associated with the construction will not be significant. Therefore, most of the potential relevant negative environmental and social impacts related to the Concession of the Rodoanel Oeste will be associated with the operation phase. The Project will be constructed utilizing modern engineering techniques and the Concession Agreement foresees also specific control measures and plans that shall be adopted by the Concessionaire to mitigate and monitor environmental and social impacts.
- 1.7 On the other hand, the Rodoanel Oeste has associated with it relevant environmental and social benefits. The freeway effectively contributes to improve traffic flow and reduce both total travel time and total travel distance of road users in the MRSP; consequently, contributes to reduce also fuel consumption and air pollutant emissions from vehicles that would be in stop-and-go or idling traffic. The improvement in traffic flow allows less stressing travel conditions and enhancement of well-being and quality of life of people. It is particularly relevant to note also the contribution of the Rodoanel Oeste to reduce greenhouse gas ("GHG") emissions from vehicles that would be in stop-and-go or idling traffic in the MRSP transit. Studies performed indicate a potential reduction in CO2 emissions in the MRSP estimated to be on the order of more than 1 million ton of CO2 per year in association with the operation of the Rodoanel Oeste.
- 1.8 Besides the impacts described in the previous sections and indirectly related to the Project being considered for possible financing by IDB, there may be some potential environmental and social liabilities and/or reputational risks associated with possible pending issues or improper mitigation of construction and operation-related impacts by the public sector prior to the Concession. However, these risks are expected to be limited as the road project has been developed and implemented under close and strict scrutiny of the State Environmental Protection Agency, local governmental authorities and civil society, and designed and constructed using modern engineering techniques. The Bank will supervise and monitor the execution of the operation to confirm that the Concessionaire is properly addressing any pending issue.
- 1.9 Taking into account the potential environmental and social impacts and mitigation measures associated with the Project, as per IDB's OP 703 the Project has been classified as a Category B operation.
- 1.10 The Bank performed an Environmental and Social Due Diligence ("ESDD") in order to confirm that all Project relevant impacts and risks have been, or will be properly and adequately evaluated and mitigated.

## II PROJECT DESCRIPTION

### A. General Aspects and Existing Infrastructure

- 2.1. The Metropolitan Region of São Paulo encompasses 39 municipalities and, with an estimated population of approximately 21.6 million people (in 2008) dispersed over around 8 thousand square kilometers, is ranked as either the second or third most densely populated in the Americas and one of the largest metropolitan areas in the world. In the MRSP there are approximately 7.2 million vehicles (cars, buses and trucks).
- 2.2. The State of São Paulo has a population of approximately 42 million inhabitants and its road network develops greatly on a radial pattern converging to the capital city, São Paulo. With the absence of a beltway that could better direct the traffic coming from these roads, this type of design drains a significant amount of traffic and has a deleterious effect on the MRSP traffic, as several dislocations are not meant to the MRSP, but need to cross it heading to other destinations. This through traffic contributes significantly to deteriorate the circulation conditions in the major traffic corridors of the MRSP. In addition, the heavy traffic conditions not only generate clogged streets and expressways, but also contribute to increase noise levels and air pollutant concentrations in the region.
- 2.3. In fact, the MRSP endures considerable and periodic air pollution problems. Air quality drops below minimum acceptable standards for several days a year. Motor vehicles are responsible for a great proportion of toxic pollutants released into the atmosphere. Buses and trucks, the majority of which are powered by diesel engines, are major contributors to air pollution.
- 2.4. The Rodoanel Oeste is the first section of a 182-kilometer beltway that will eventually surround a great part of the MRSP and be located 20 to 40 km from downtown São Paulo. The primary objective of implementing the beltway is to better allocate traffic flows across the MRSP, but also to reduce the traffic congestion in central São Paulo, where trucks and passengers currently cross the city as the most direct linkage between productive areas in the State, coastal areas and the Port of Santos. The GoSP is constructing the beltway in four distinct sections (West, South, North and East), all of which will be constructed by the State before being delivered to the private sector under concession, as was the case for the Rodoanel Oeste. Each of these sections can be developed and operated independently and the GoSP is implementing them separately.
- 2.5. Rodoanel Oeste links some of the most important access roads to the MRSP (responsible for almost 50 percent of the traffic entering the MRSP), including: (i) *Bandeirantes* Highway (SP-348); (ii) *Anhanguera* Highway (SP-330); (iii) *Castello Branco* Highway (SP-280); (iv) *Raposo Tavares* Highway (SP-270); and (v) *Régis Bittencourt* Highway (BR-116). Construction of Rodoanel Oeste began in 1998 with traffic flows commencing in the first segment in 2001. Since that time, Rodoanel Oeste has been operated under the responsibility of *Desenvolvimento Rodoviário S.A* (“DERSA”), a state owned company charged with operating and maintaining various sections of the São Paulo State highway network. Preliminary data presented by the Concessionaire show a volume of traffic in the Rodoanel Oeste of approximately 197 thousand vehicles per day (213 thousand considering only the

weekdays). It is estimated that the annual traffic will grow at a rate of approximately 6 to 11 percent during the first decade of concession.

- 2.6. The Rodoanel Oeste crosses mainly urban and peri-urban areas on the outskirts of the Metropolitan Region, but there are also segments crossing more forested areas and in some of them a development in tunnel has been adopted to minimize the impacts on those areas. In addition, the freeway crosses via a bridge a small section of the Tietê River Plain Protection Area (*APA da Várzea do Tietê*), which has mainly been created to preclude commercial and residential occupation of the low-lying areas prone to periodic flooding.
- 2.7. The main characteristics of the Rodoanel Oeste are: (i) total extension of approx. 32 km; (ii) typical cross section includes - two roadways (one for each direction of traffic), three or four lanes and one outer shoulder in each roadway, and an 11-meter wide median strip; (iii) design speed of 100 km/h; (iv) 68 bridges and three double tunnels; and (v) seven interchanges. The ROW has been established unusually wide (standard width of 130 meters and minimum of 100 meters), to accommodate future works that may be needed, such as frontage roads and toll plazas. The Rodoanel Oeste presents also physical barriers and fences to deter unwanted crossings.

## **B. Proposed Project Components**

### ***B.1 Construction Work***

- 2.8. The Concession does not involve the construction of any new highway segment. Nevertheless, to fulfill the requirements of the terms of the Concession a limited amount of works will be necessary to be undertaken by the Company. The main civil works foreseen under the Concession will be mostly developed inside the right-of-way ("ROW") of the Rodoanel Oeste and essentially limited to: (i) implementation and adaptation of thirteen toll plazas (already executed); (ii) implementation of Inspection Control System, comprising two General Inspection Stations, with scale and highway patrol, speed control system with two fixed radars, License Plate Recognition System ("OCR") with two sets of equipment; (iii) expansion and implementation of special engineering structures (bridges, overpasses, etc.); (iv) implementation of telecommunication systems by means of a radio system with fixed, mobile, portable and repeating stations, a system for data transmission, an operational control center and auxiliary support stations, a user communication system, a variable message sign (fixed and mobile)<sup>(2)</sup>; (v) implementation of the traffic monitoring system, with sensing system, closed circuit TV monitoring system; (vi) implementation of acceleration and deceleration lanes; (vii) implementation of additional lane - 5th lane in the section between Castello Branco and Raposo Tavares Highways; (viii) implementation of frontage roads - construction of ten kilometers of frontage roads in both sides of Rodoanel, between Padroeira and Raposo Tavares Highway intersections and restoration of seven kilometers of frontage roads in Carapicuíba, between Avenida dos Autonomistas and Padroeira intersection; (ix) implementation of six additional pedestrian overpasses; (x) implementation of systems for junctions, operational returns and special engineering structures; (xi) implementation of acoustic barriers, and (xii) other improvement work to be indicated by the Concessionaire, if needed.

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(2) *Electronic panels.*

2.9. **Table 2.2** summarizes the main construction works foreseen, as defined by the Granting Authority and ARTESP.

**Table 2.2: Construction Works Foreseen by Granting Authority and ARTESP**

Expansion Work	Characteristics and Location	Deadline
Additional Lane	(5th lane) in the Castello - Raposo section.	157 months from the start of the concession; conclusion distributed until the 360th month.
Frontage Roads	10 km of frontage roads in both sides of Rodoanel between Padroeira and Raposo Tavares Highway intersections; Restoration of 7 km of frontage roads in the municipality of Carapicuíba, (Av. dos Autonomistas to Padroeira Intersection).	These works will have to commence in 25 months with completion in 72 months after the existing system is transferred to the Concessionaire.
Pedestrian Overpasses	1 near the entrance of Tunnel 3, in the district of Vista Alegre; 5 in locations to be defined.	Start in 25 months and completion in 132 months after the existing system is transferred to the Concessionaire.
Systems for Junctions, Operational Returns and Special Engineering Structures	Improvement in the accesses to Castello Branco Highway; Adaptation of Padroeira Intersection; Overpass construction - of Estrada Velha de Cotia.	These works will be initiated in the first year and completed in 36 months after the existing system is transferred to the Concessionaire.
Acoustic Barriers	km 12, Tamboré, double barrier, 1000 m in extension each; km 22, inner loop, 1000 m in extension; km 23.5, outer loop, 1000 m in extension.	Expected start and completion dates: 13th and 36th month, respectively, after the existing system is transferred to the Concessionaire.

Source: Call for Bids

## ***B.2 Operational Activities***

2.10. Services that correspond to operational functions for the Concessionaire comprise the following: (i) operation of integrated system for traffic supervision and control; (ii) operation of toll plazas, including toll collection, vehicle traffic control and financial and accounting control of the amounts collected; (iii) operation of fixed and mobile stations for static and dynamic weighing of vehicles, including the weighing itself (iv) user support, including, but not limited to, first aid and medical assistance to victims of traffic accident, with eventual transportation to hospitals, mechanical service for disabled vehicles, towing, lane clearing, operation of emergency phone service and guidance and information to users; (v) inspection of lane, right-of-way and remaining areas, regular and emergency signage and operational support to remaining services; (iv) design and implementation of operational schemes for extraordinary circumstances, including special operations for rush hours, traffic detours for construction work, special operations for transporting exceptional and hazardous materials and special schemes for sports events and others in the Highway System; (vii) design and implementation of operational plans and schemes for emergency situations, such as fires, fog, accidents involving hazardous materials, landslides, floods and other such accidents that may

cause direct impact upon traffic flow and safety, or that may cause environmental damages; and (viii) monitoring traffic conditions on the highway.

### ***B.3 Conservation Activities***

- 2.11. In addition to operational activities, the Concessionaire shall execute conservation actions that encompass: (i) routine maintenance of elements that are part of the Highway System, such as: pavement, drainage, tunnels, special engineering structures, signage, highway safety devices, vegetation cover and remaining elements of the ROW, control and automation systems, telecommunication systems, building facilities, operational and support yards, electrical systems and lighting systems; (ii) special maintenance of all elements that are part of the Highway System, aiming at preserving the original Project, including repaving of lanes, restoration of concrete pavement and of special engineering structures, substitution of vertical and horizontal signage, substitution of control, collection, communication and automation equipment, renovation of facilities and others; and (iii) emergency preservation, to immediately replace, reconstruct or restore the section that has been obstructed to normal conditions, as well as facilities, equipment and other highway elements that may have been damaged due to any given causes.

### ***B.4 Services Remaining under the Granting Authority's Responsibility***

- 2.12. The Concessionaire will not be responsible for: (i) highway patrolling; (ii) inspection and issuance of fines, and (iii) issuance of authorizations or grants, pursuant to the law, related to: public transportation services by international, interstate and intermunicipal roads; public transportation services by international, suburban, metropolitan or municipal urban areas; public transportation of rural workers or people in cargo vehicles; the holding of events on the highway; transportation services related to exceptional and hazardous materials.

### ***B.5 Traffic Studies***

- 2.13. The Concessionaire conducted a traffic assessment for the highway, by means of an initial count at toll plazas. The results are summarized in **Table 2.3**.



**Table 2.3: Initial Traffic - Average Daily Traffic (ADT) at Toll Plazas**

Station	Location	Average Daily Traffic (ADT)
P1	km 0.5	17,405.16
P2	Access to SP-348 Outbound Traffic	14,015.48
P3	Access to SP-348 Inbound Traffic	10,912.91
P4	Access from Inner Loop to SP-330 Inbound Traffic	7,045.61
P5	Access from Inner Loop to SP-330 Outbound Traffic	4,298.95
P6	Access from Outer Loop to SP-330 Outbound and Inbound Traffic	6,619.82
P7	Access from Inner Loop to SP-280 Outbound and Inbound Traffic	37,544.37
P8	Access from Outer Loop to SP-280 Outbound Traffic	12,348.82
P9	Access from Inner Loop to Padroeira Intersection	6,570.47
P10	Access from Outer Loop to Padroeira Intersection	12,098.09
P11	Access from Inner Loop to SP-270 Outbound and Inbound Traffic	9,569.24
P12	Access from Outer Loop to SP-270 Outbound and Inbound Traffic	23,806.49
P13	km 25.0	34,327.49
-	<b>Total</b>	<b>196,562.89</b>

## ***B.6 Project Workforce***

2.14. The allocation of work force during the concession period, as predicted for the operation, is provided in the following table

**Table 2.5: Workforce Allocation Forecast**

Phase	Period (month)	Administration and Management	Collection	Traffic	Medical (Pre-Hospital)	Weighing	Total
1	From 1st to 6th	59	-	-	-	-	59
2	From 7th to 12th	81	404	28	29		542
3	From 13th to 24th	81	404	28	29		542
4	From 25th to 36th	81	404	28	29		542
5	From 37th to 72nd	81	404	28	29	29	571

## ***B.7 Other Relevant Projects***

The South Section of Rodoanel Mário Covas is being implemented and expected to enter into operation in March 2010, but efforts are being developed to anticipate the beginning of operation to the end of 2009. This completion will allow the traffic coming from the West Section (Rodoanel Oeste) to reach the Port of Santos (the largest port in Brazil, handling cargo for imports and exports) and the *Baixada Santista* (coastal beaches) area through the *Anchieta* and *Imigrantes* Highways, therefore linking and). The impact upon the use of Rodoanel Oeste is expected to be significant in terms of its optimization.

### III COMPLIANCE WITH ENVIRONMENTAL LICENSES AND POLICIES

- 3.1 Brazilian and State of São Paulo environmental legislation usually foresees three sequential environmental licenses for large projects: (i) Preliminary License at planning stage; (ii) Installation License to initiate construction; and (iii) Operating License authorizing operation of the project.
- 3.2 For most of the works involved in the Concession, a specific environmental license is not required under the State of São Paulo and Brazilian legislation, due to their limited magnitude and the fact that they will mostly be developed inside the ROW of the Rodoanel Oeste, and the State Environmental Department (“SMA”) issued a specific Resolution clarifying this matter. Regarding the new frontage road segments, although they will also be developed inside the ROW, the Concessionaire will have in the future to consult SMA, in due time and on a timely basis, to ascertain if a specific environmental license will be required, and if so, what type of environmental assessment will be needed, which most likely will be a simplified procedure, requiring either a Simplified Environmental Assessment (Portuguese Acronym: “EAS”), or a Preliminary Environmental Report (Portuguese Acronym: “RAP”).
- 3.3 The Operating License for the Rodoanel Oeste, granted to the state road company (“DERSA”), has been renewed in 2006 and is valid for five years. Some of the environmental requirements associated with the Operating License will be applicable to the Concession, others have already been resolved by the state company. Previously, in 1997 the road project has been granted the necessary Preliminary License, and to support the licensing process, an Environmental Impact Assessment Report and respective Statement (Portuguese Acronym: “EIA/RIMA”) have been prepared and widely disclosed through a series of public consultation activities, which were developed and implemented in accordance to good practices and State legislation. Subsequently, the road project received also the necessary Installation Licenses required for construction.
- 3.4 Under the terms of the Operating License the Concessionaire has to prepare and submit to the SMA an annual environmental report describing the relevant environmental aspects related with the operation of the Rodoanel Oeste and status of compliance with license requirements. Similarly, the Granting Authority, through ARTESP, requires the Company to present an annual Environmental Performance Report (Portuguese Acronym: “RADA”) describing its performance in relation to 10 environmental indicators that are systematically evaluated by the Granting Authority.
- 3.5 The Project will not: (i) convert or degrade critical natural habitats or damage critical cultural sites; (ii) significantly convert or degrade natural habitats; (iii) raise any significantly negative indigenous issues; (iv) generate any significant resettlement issues; or (v) have associated any trans-boundary issue. An analysis of the Project made under the applicable directives of IDB’s OP 703 Environment and Safeguards Compliance Policy have triggered the following: (B.04) Environmental or Social liabilities of the project and/or other projects or nearby sites; (B.05) an Environmental Assessment has been performed; (B.06) Consultations have been performed; (B.11) Potential to cause air, soil or water contamination; (B.12) Part of the investment is already under construction by the Executing Agency or the Borrower; and (B.15) Any part of the investment or component(s) is being co-financed. IDB’s Environmental and Social Impact Review (“ESR”) approved the Environmental and Social

Strategy for the Project on December 5, 2008, with the Project being classified as a Category B operation per the IDB Environment and Safeguards Compliance Policy.

- 3.6 Although by national and state legislation an EIA and respective RIMA are not required in the case of the Project, the Bank required the Company to present an Environmental Analysis Report to address potential relevant environmental and social impacts, as well as the correspondent control measures (monitoring and mitigation) associated with the Project being considered for financing by the Bank. This report has been disclosed to the public in accordance with IDB's Operational Policy OP-102 - Disclosure of Information (see **Section VII**).

## **IV ENVIRONMENTAL AND SOCIAL CONDITIONS**

- 4.1 The Rodoanel Oeste crosses mainly urban and peri-urban areas on the outskirts of the Metropolitan Region, but there are also segments crossing more forested areas and in some of them a development in tunnel has been adopted to minimize the impacts on those areas. In addition, the freeway crosses via a bridge a small section of the Tietê River Plain Protection Area (*APA da Várzea do Tietê*), which has mainly been created to preclude commercial and residential occupation of the low-lying areas prone to periodic flooding.

### **A. Physical Environment**

- 4.2 The relief in the region of the Rodoanel Oeste is basically comprised of four types of terrain: fluvial plains, hills and small hills, foothills and mountains. The geometric characteristics of this highway (small-angle longitudinal slopes and large radius curves) helps mitigate the impacts on the natural drainage system, which is assisted by the low erosive potential characteristic of the soil.
- 4.3 Relative to water resource systems, Rodoanel Oeste is located completely in the Alto Tietê Basin. The watercourses whose contributing basins are crossed by and/or tangent to the project are the following: (i) Rio Embu-Mirim; (ii) Carapicuíba Creek; (iii) Tietê River; (iv) Três Irmãos Creek; (v) Garcia Creek; (vi) Itaim Creek; (vii) Secondary creeks in the Juqueri River basin (Santa Fé, São Miguel and Perus). It should be pointed out that there is no use of these water resources for water supply use. These rivers do not present adequate water quality for water supply, as a result of illegal sewer discharges and surface runoff contributions from adjacent urban areas.

### **B. Biotic Environment**

#### ***B.1 Vegetation Cover and Fauna***

- 4.4 The forest cover found in the vicinities of the Rodoanel Oeste has already been greatly impacted by urbanization that occurred prior to the road project. The fragments that exist present characteristics of great anthropic influence, and the presence of an intense road system increases their isolation. Nevertheless, there are still some well conserved forest patches at the two extremities of the Rodoanel.

- 4.5 Regarding the fauna, as a result of the intense urbanization process in the road project direct area of influence, no species of relevant interest were reported. Wildlife is found mainly in the remaining forest fragments (Itahyê Farm and Pico do Jaraguá) and in small eucalyptus forest patches located between state highways SP-330 and SP-348, particularly the Anhanguera Park.

## ***B.2 Nature Conservation and Recreation Areas***

- 4.6 The following four natural or recreation parks are located in the vicinities, or are crossed by the Rodoanel Oeste, but it should be pointed out that none of these parks are considered a Natural Park or Conservation Unit:
- (i) Municipal Park Nascentes, located near an area where the freeway passes through a tunnel (this park has been created as an environmental compensation measure for the construction of the Rodoanel Oeste by the Government of the State of São Paulo).
  - (ii) Municipal Recreation Park dos Paturis, located adjacent to a segment of the freeway (this park has also been created as a compensation measure for the construction of the Rodoanel Oeste by the Government of the State of São Paulo).
  - (iii) Tietê River Plain Protection Area, which has mainly been created to preclude commercial and residential occupation of the low-lying areas prone to periodic flooding and is crossed by a bridge section of the road.
  - (iv) State Recreation Park Tizo that has been created in 2006, i.e. five years after initiated the operation of the Rodoanel, has a tip that is crossed by the road. An environmental compensation measure associated with the Project involves the planting of new trees in Park Tizo, to compensate for trees in the ROW that will need to be removed to construct the new frontage roads and toll facilities related to the Concession.
- 4.7 As most of the construction work associated with the Concession will be developed inside the ROW, no significant environmental impacts are anticipated on these parks during construction. Similarly, the operation of the freeway during Concession is not expected to generate any additional significant environmental and social impacts on those parks and their users.

## **C. Socioeconomic and Cultural Conditions**

- 4.8 The Metropolitan Region of São Paulo encompasses 39 municipalities and, with an estimated population of approximately 21.6 million people (in 2008) dispersed over around 8 thousand square kilometers, is ranked as either the second or third most densely populated in the Americas and one of the largest metropolitan areas in the world. In the MRSP there are approximately 7.2 million vehicles (cars, buses and trucks). Other metropolitan regions that are located relatively close to São Paulo are also among the largest in the State in demographic terms: Campinas, Baixada Santista, São José dos Campos and Sorocaba.
- 4.9 The MRSP is an obligatory passageway for all movement going towards or originating from Santos Port (the largest and busiest in the country). It is the preferred passageway for

movement of cargo from the Southern part of the country (including Mercosul countries) to Rio de Janeiro, Minas Gerais and Espírito Santo. It is the predominant alternative to Bahia and the Brazilian Northeast; thus, representing a passageway and a redistribution and transfer hub.

- 4.10 The Rodoanel Oeste passes through densely populated areas of the MRSP, encompassing areas of the following municipalities: São Paulo, Barueri, Carapicuíba, Osasco, Cotia and Embu.

### ***C.1 São Paulo - Northern Zone***

- 4.11 With a population of over three million inhabitants, this region of the São Paulo city is supported by a extensive public transportation network that includes the Blue Line (Line 1) of the city's subway system, which connects the Northern Zone to the Southern Zone, and connects also with the Red Line that links the Eastern Zone with the Western. There are also the São Paulo Metropolitan Train Company ("CPTM") lines that connect this part of the city with Campinas and Osasco municipalities. The public mass transportation system in the city has its lines administrated by São Paulo Transportation ("SPTrans") and connects all city regions. The gross domestic product ("GDP") of the entire São Paulo city is estimated at approximately R\$ 264 billion (around USD 132 billion).

### ***C.2 Barueri***

- 4.12 With a territory of approximately 64 km<sup>2</sup> and a population of around 274 thousand inhabitants, the municipality of Baureri is very prosperous with a GDP that is the second in the State of São Paulo and the eight in the country (approximately R\$ 25.5 billion or around USD 13 billion), mostly from the service sector, and also significantly from the industrial sector along the Castello Branco Highway near Rodoanel Oeste.
- 4.13 The Barueri industrial park is considered one of the most dynamic of the MRSP, as a result of factors such as proximity to the state capital, low taxation guaranteed by municipal law, the availability of qualified labor, and a complete infrastructure for the installation of new companies with the opening of new areas, such as the Votupoca Industrial District, and the new city commercial center. Barueri has four business parks: Industrial District of Votupoca, Jardim Belval, Jardim Califórnia, and Alphaville/Tamboré.
- 4.14 Alphaville, a district of Barueri, close to Rodoanel Oeste, is one of the largest generators of urban traffic because of its residential, service, and commercial characteristics, as well as the presence of numerous industries close to Tamboré and Castello Branco. The resident population of this region of the city is around 50 thousand inhabitants, and also has a floating population of around 150 thousand people per day, comprised of persons who work in or visit Alphaville for business or leisure.
- 4.15 Barueri public mass transportation is supported by CPTM, by a regional bus company, and by CPTM's Line 8 trains, making intermunicipal connections with Osasco, Carapicuíba and São Paulo.

### ***C.3 Osasco***

- 4.16 Osasco has around 700 thousand inhabitants and is located next to the state capital, which implies that a good part of its population works in the capital. It has a GDP of approx. R\$18 billion, with a 2.22% share of the state's GDP. The most prominent contribution comes from the service sector, with 85.5% of the total municipal GDP. The industrial sector represents 14.5% of the GDP.
- 4.17 The public transportation network which serves Osasco is comprised of 34 municipal lines operated by two private companies and the Osasco Municipal Transportation Company ("CMTO"). The CPTM serves also in the case of intermunicipal lines.

### ***C.4 Carapicuíba***

- 4.18 With a population of approximately 380 thousand inhabitants, Carapicuíba, as it is also located close to the state capital, has a large part of its population that lives in Carapicuíba, but works in São Paulo. According to the Brazilian Institute of Geography and Statistics, ("IBGE"), Carapicuíba has a GDP of approximately R\$2.2 billion, with a tiny share of 0.27% of the state's GDP. Its largest contribution comes from the service sector.
- 4.19 The existing public mass transportation in the municipality of Carapicuíba is formed by the Metropolitan Urban Transportation Company ("EMTU"), responsible for intermunicipal transportation, and by the Transportation and Tourism Company of Carapicuíba ("ETTCarapicuíba"), which offers municipal public mass transportation.

### ***C.5 Cotia***

- 4.20 The municipality has a population of around 180 thousand inhabitants, of which a significant percentage works or studies in the state capital. It has a GDP of approximately R\$ 3.7 billion, with the service sector contributing around 64% to this total. The industrial sector corresponds to 36% and is located on the axis of Raposo Tavares Highway, near Rodoanel Oeste.
- 4.21 The Cotia public transportation network is comprised of a private company for local circulation, and the EMTU for intermunicipal transportation.

### ***C.6 Embu***

- 4.22 Located 25 km from São Paulo, the municipality of Embu has a population of approximately 317 thousand inhabitants, with a GDP of approximately R\$1.9 billion, making only 0.24% of the state GDP. The agricultural sector of this community is very small, and the industrial sector is much larger along Regis Bittencourt Highway. The municipality has a dynamic service sector comprising around 64% of its GDP.
- 4.23 The public mass transportation network in Embu is comprised only of the EMTU.

### ***C.7 Historic and Cultural Heritage***

- 4.24 The following areas, which are protected by the State Historic and Architectural Heritage Council (“CONDEPHAAT”), are located in the general area of influence of the Rodoanel Oeste: Ferro Perus - Pirapora Road (Cajamar, Caieiras and São Paulo); Santana de Parnaíba Historic Center; Nossa Senhora da Conceição Chapel (in Santana de Parnaíba); Nossa Senhora da Escada Image (in Barueri); Carapicuíba Village; Sítio Mandu (in Cotia), Sítio do Padre Inácio (in Cotia); and Nossa Senhora do Rosário Church (in Embu). However, the implementation of the Rodoanel Oeste did not affect any protected areas or those considered as of historic heritage. Nevertheless, during construction, DERSA performed the Archeological and Historic Property Rescue Program, in compliance with Brazilian legislation. The implementation of the works associated with the Concession is not expected to affect any historic or cultural heritage site.

### ***C.8 Jaraguá Indigenous Settlement***

- 4.25 The implementation of the Rodoanel Oeste did not cause any direct or indirect impact on Indigenous Peoples. Similarly, the works and activities involved in the Concession are not expected to cause any direct or indirect impact on these types of communities. Nevertheless, as a result of negotiations of the GoSP, DERSA and the National Indian Foundation (“FUNAI”) in relation to the South Section of the Rodoanel Mário Covas, the Granting Authority established that the Concessionaire will have to allocate financial resources to DERSA, to reimburse the state-owned company for the purchase of lands for the expansion of the area of the Jaraguá Indigenous Settlement in another region of the MRSP (see **Section V.E**).
- 4.26 The small Jaraguá Indigenous Settlement is located within the urban area of the city of São Paulo, in area of about 1.75 hectares (approximately the size of a city block), adjacent to other roads and urban streets. It is located, along the Southern limit of the Jaraguá State Park and the Rodoanel Oeste stretches beyond the Northern limit of the aforementioned park. The distance between the Jaraguá Indigenous Settlement and the Rodoanel Oeste is of approximately 3.5 km, in a straight line. However, both are separated by the foothills of the Jaraguá Peak (with approximately 1135 meters it constitutes the highest peak in the MRSP), and there are no direct access roads or connections between the Rodoanel Oeste and the Jaraguá Indigenous Settlement. Therefore, the Settlement is effectively isolated from the Rodoanel Oeste.

## **V ENVIRONMENTAL AND SOCIAL IMPACTS, RISKS AND MITIGATION MEASURES**

### **A. Basic Aspects**

- 5.1 As the Concession does not involve the construction of any new highway segment, and in view of the relatively limited magnitude of the construction works and the fact that they will essentially be developed inside the ROW of the Rodoanel Oeste, most of the potential negative environmental and social impacts associated with the construction phase of the Project will not be significant.

- 5.2 Therefore, most of the potential relevant negative environmental and social impacts related to the Concession of the Rodoanel Oeste will be associated with the operation phase.
- 5.3 The Project will be constructed utilizing modern engineering techniques and the Concession Agreement foresees also specific control measures and plans that shall be adopted by the Concessionaire to mitigate and monitor environmental and social impacts.
- 5.4 Furthermore, the Company will adopt policies, procedures, programs and plans similar to the ones undertaken in other projects sponsored by *Companhia de Concessões Rodoviárias S.A.* (“CCR”), one of the main shareholders of Rodoanel Oeste Concessionaire. Some of these projects are being or have been implemented under the support, guidance and supervision of IDB. For instance, in the subway concession for the operation of Metro São Paulo Line 4, which recently entered in its supervision phase, IDB successfully introduced requirements to enhance the environmental and social, and health and safety management systems of the project as well as the project company; thereby encompassing the activities of the entire company, which represents a key factor in reducing environmental, social, health and safety risks, for the company and for IDB.
- 5.5 On the other hand, the Rodoanel Oeste has associated with it relevant environmental and social benefits. The freeway effectively contributes to improve traffic flow and reduce both total travel time and total travel distance of road users in the MRSP; consequently, contributes to reduce also fuel consumption and air pollutant emissions from vehicles that would be in stop-and-go or idling traffic. The improvement in traffic flow allows less stressing travel conditions and enhancement of well-being and quality of life of people. It is particularly relevant to note also the contribution of the Rodoanel Oeste to reduce greenhouse gas (“GHG”) emissions from vehicles that would be in stop-and-go or idling traffic in the MRSP transit. Studies performed indicate a potential reduction in CO<sub>2</sub> emissions in the MRSP estimated to be on the order of more than 1 million ton of CO<sub>2</sub> per year in association with the operation of the Rodoanel Oeste.
- 5.6 Besides the impacts described in the previous sections and indirectly related to the Project being considered for possible financing by IDB, there may be some potential environmental and social liabilities and/or reputational risks associated with possible pending issues or improper mitigation of construction and operation-related impacts by the public sector prior to the Concession. However, these risks are expected to be limited as the road project has been developed and implemented under close and strict scrutiny of the SMA, State Environmental Protection Agency (“SMA”), local governmental authorities and civil society, and designed and constructed using modern engineering techniques. The Bank will supervise and monitor the execution of the operation to confirm that the Concessionaire is properly addressing any pending issue.

## **B. Potential Negative Impacts and Control Measures Associated with Construction**

- 5.7 The main potential negative environmental and social impacts during construction will be those associated with any moderate-scale construction work. Also, most of these impacts will be limited in scale and temporary, and can be mitigated with standard construction environmental management procedures that will be adopted or required by the Company.



- 5.8 In addition, several plans, programs and procedures adopted by the state company to avoid, mitigate, compensate and monitor impacts during construction of the road project will similarly be adopted during the construction works necessary for the Concession. These will also include plans and procedures to control environmental and social, as well as health and safety performance of contractors, and plans and procedures to address accidents and emergency situations.
- 5.9 Environmental compensation measures associated with the Project include the planting of new trees in the State Recreation Park Tizo created in 2006 adjacent to the freeway, to compensate for trees in the ROW that will need to be removed to construct the new frontage roads and toll facilities related to the Concession.
- 5.10 As a further guarantee of good environmental and social, and health and safety performance, the construction works and work sites will be periodically inspected by local and State environmental and health and safety authorities.

### ***B.1 Environmental***

- 5.11 *Interference with vegetation cover.* It has been necessary to suppress a total of 6370 seedlings from the ROW for the installation of the toll plazas. As a compensation measure, the seedlings were replanted at the Recreation Park Tizo.
- 5.12 *Soil erosion.* Erosive processes may occur, mainly laminar erosions on the surface of the terrain where there is bare soil exposed, during earthmoving work necessary for the implementation of frontage roads and toll plazas. The use of temporary drainage systems and protection of the surface of exposed areas (*e.g.*, with mulch, plastic cover, geotextile fabrics) minimize or even eliminate these occurrences.
- 5.13 *Increase in noise levels.* Noise may be generated in association with the operation of trucks and earthmoving equipment and this can cause acoustic discomfort to receptors in nearby areas. However, it should be pointed out that most of the construction activities will take place during daytime and will be temporary.
- 5.14 *Deterioration of air quality by the emission of particulate matter.* Dust and soot may be generated in association with the operation of trucks and earthmoving equipment and this can cause discomfort to workers and other receptors in nearby areas. However, the contractors shall adopt measures to control dust and soot formation, such as water spraying, especially on very dry days, and proper tune up of trucks and equipment engine.
- 5.15 *Soil contamination.* The inadequate disposal of solid wastes or discharge of liquid effluents, and spills generated during construction may cause contamination of nearby soil. The wastes generated during construction may be domestic (from cafeterias, bathrooms, and offices), from ambulatories, inert (rubble, or other originating from terrain cleaning activities), and industrial (packaging material, paper, plastic and metal, oil, grease and scrap material originating from vehicle, machine, and equipment maintenance shops). The Company will adopt procedures to ensure proper handling and destination of each type of waste, according to current strict regulations in the State of São Paulo.

- 5.16 *Surface and groundwater contamination.* Dust and erosion generated during construction activities may reach drainage systems and nearby water bodies causing siltation and temporary increase in turbidity. Also, spills and inadequate discharge of liquid effluents may cause contamination of surface and groundwater. The Company will require from the contractors the use of leak containment systems, adoption of accident prevention procedures, and, if necessary, remediation actions.
- 5.17 *Interference with nature conservation and recreation areas.* No significant impacts are expected on nature conservation and recreation areas in association with the construction works related to the Concession, as most of the activities will be developed inside the ROW. The works at the Tietê River Plain Protection Area, which is crossed by the Rodoanel Oeste in its urban section, will be limited to the widening of the existing bridge deck itself without significant modification of other elements of the bridge superstructure.

## **B.2 Social**

- 5.18 *Expropriations.* Although most of the works will be developed inside the ROW, it is possible that the implementation of some of the works associated with the Concession may require land expropriation (*e.g.*, the construction in the future of the 10 km of frontage roads). No significant number of residential or commercial properties is expected to be affected by these works. Nevertheless, if in the future it is recognized that a significant number of residences or commercial activities may be affected, the Concessionaire shall prepare a Resettlement Plan according to IDB's Policy OP710 on Involuntary Resettlement. The confirmation of this impact and its magnitude will become clear after detailed studies are made of the frontage road project design. The Concessionaire will adopt solutions that minimize intervention in areas occupied by human activity and expropriations. The Concessionaire has also social workers in its staff to deal proactively with the communities located adjacent to the Rodoanel Oeste; their activities include meetings with local leaders and community members, and provision of information about the project to the communities.
- 5.19 *Changes in building conditions and value.* This impact is related to possible damages that may be caused on buildings located close to construction sites, which could cause depreciation of the property. Usually the occurrence of this type of impact is evidenced by the appearance of cracks and fissures and/or deficiencies in sanitary installations. Measures to mitigate these impacts are, among others: (i) maintenance of a communication plan and immediate remediation in case of detection or complaint of risk or damage to buildings; (ii) building monitoring plan for facilities potentially susceptible to risk; and (iii) adoption of construction techniques that generate low vibration. However, in the case of the Concession works, this type of impact is expected to be minimal as most of the construction activities will be developed inside the ROW and relatively limited in magnitude.
- 5.20 *Interference with neighboring areas.* In the worksites and fronts of work, construction companies and suppliers must observe a set of rules in order to make the services that are going to be developed in compliance with the basic aspects of safety and of low interference with neighboring communities, such as: (i) control of particulate matter and gas and noise emission; (ii) security teams trained in the work sites and capable of guiding workers, visitors

and the vicinity itself regarding possible risks; (iii) internal committees for accident prevention; and (iv) certification and training programs for drivers and equipment operators.

### ***B.3 Health and Safety***

- 5.21 *Accidents involving workers.* Work at high places or near excavated areas, transportation and operation of large machines and equipment, and handling of chemical products are among the situations that may represent a health and safety risk to workers. These risks are well known and are easily identified, evaluated, and controlled, or even prevented by the adoption of standard construction and health and safety management procedures that will be adopted or required by the Company, and which are also regulated by national and state regulatory standards.

## **C. Potential Negative Impacts and Control Measures Associated with Operation**

### ***C.1 Environmental***

- 5.22 *Noise emissions from road traffic.* The magnitude of this type of impact is not expected to change significantly with the Concession. To deal with this kind of impact, the state-owned company (DERSA), which was responsible for operation of the Rodoanel Oeste prior to the Concession, established a protocol with the Technological Research Institute of the State of São Paulo (“IPT”) to carry out studies to evaluate existing noise levels (background and with road traffic), and present recommendations for monitoring and mitigation actions.
- 5.23 The studies and noise level measurements carried out by IPT indicated three relevant areas adjacent to the Rodoanel Oeste in terms of noise impact: (i) km 12 (Tamboré Condominium); (ii) km 22; and (iii) km 23.5. To contribute to attenuate noise levels associated with the road traffic at the Rodoanel Oeste, IPT suggested the following measures: (i) reduce the noise generated at the source (tire/pavement interaction), making interventions on the pavement; and (ii) subsequently installation of acoustic barriers on those relevant sections of the Rodoanel Oeste.
- 5.24 Based on the IPT studies’ results, the Granting Authority included in the works to be addressed by the Concession the implementation of the following acoustic barriers: (i) km 12, Tamboré, double barrier, 1000 m in extension each; (ii) km 22, inner loop, 1000 m in extension; (iii) km 23.5, outer loop, 1000 m in extension.
- 5.25 The recommendations made by IPT are being adopted by the Concessionaire and the Company continues to follow the studies that are still being conducted by IPT in order to obtain a better definition of the measures to be taken. The Concessionaire, under technical orientation of IPT, is currently developing pavement tests for the abatement of noise at the source. The main characteristics of asphalt mixtures that can influence the pavement texture, and consequently noise levels generated, are: (i) particle size distribution of aggregates and fillers; and (ii) nature, shape, and surface micro-texture of the aggregates.
- 5.26 *Air emissions from road traffic.* The magnitude of this type of impact is not expected to change significantly with the Concession. As a compensation measure for this kind of impact in relation to the implementation of the Rodoanel Oeste, DERSA sponsored the acquisition of

two new fixed air monitoring stations by the State Environmental Protection Agency (“CETESB”) and refurbishing of four of the Agency’s existing air monitoring network for the MRSP.

- 5.27 *Contamination of soil and water resources by accidents involving vehicles transporting hazardous materials.* Although the design characteristics of the Rodoanel Oeste make for safer traffic conditions compared to in other roads in the region, accidents may happen and the consequences can be of particular concern if vehicles transporting hazardous materials are involved. Another attenuating factor in the case of the Rodoanel Oeste is that none of the water bodies that are crossed or situated near the road are used for public supply. To mitigate even more the risks or consequences of this type of accidents, specific measures were adopted in the Rodoanel Oeste at the design level, and procedures and plans developed to properly address these events.
- 5.28 The Rodoanel Oeste drainage system includes spill containment tanks and water-oil separators in some of the segments of the road. Furthermore, DERSA developed a Risk Management Plan and an Emergency Action Plan, both addressing instances of accidents involving vehicles transporting hazardous materials. Upon assuming the concession, the Company adopted DERSA’s plans and is in the process of making the necessary adjustments.
- 5.29 *Contamination of soil and water resources by improper discharge of solid wastes.* The main types of solid wastes generated during operation are composed of: (i) litter, debris and vegetation originating from cleaning the ROW; and (ii) general wastes from offices and toll plazas. To minimize and avoid this type of impact, the Company is developing and will implement a Waste Management Plan that will include procedures to ensure proper handling and destination of each type of waste, and also a recycling program for some of the wastes.
- 5.30 *Contamination of soil and water resources by improper discharge of liquid effluents.* The main types of liquid effluents that are normally generated during operation of the road are: (i) stormwater runoff; and (ii) sewage from office’s and toll plazas’ bathrooms and kitchens. As mentioned before, the Rodoanel Oeste drainage system includes spill containment tanks and water-oil separators in some of the segments of the road. Also, there are in the vicinities of the freeway some basins that are used to temporarily contain the runoff from the road. The sewage generated at offices and toll plazas is either directly discharged into the public collection system of the State Water and Sanitation Company (“SABESP”), or treated onsite through a septic tank and then pumped to the public collection system.

## **C.2 Social**

- 5.31 *Risks of encroachment (illegal occupation) of the ROW.* Illegal urban encroachment within linear infrastructures’ ROW is not uncommon in large Brazilian cities, despite legislation and land use control mechanisms enforced sometimes by municipal governments. This type of illegal occupation may involve commercial activities, subsistence agriculture, or even residential use. The Concessionaire understands that this is a potential social problem that must be solved in a proactive manner, with agreement and support of public authorities, communities and civil society associations. Therefore, to attenuate these risks the Company will frequently monitor the ROW for signs of potential or imminent occupation, and will deal on a case by case basis. Also, the Concessionaire has also social workers in its staff to deal

proactively with the communities located adjacent to the Rodoanel Oeste; their activities include meetings with local leaders and community members, and provision of information about the project to the communities.

- 5.32 *Risk of accidents with pedestrian and road users.* According to Concessionaire data, between June and December 2008 there were in the Rodoanel Oeste 508 accidents involving vehicle collision, pedestrians hit by cars, and falls. The most frequent types of events involved were: (i) lateral collisions between vehicles; (ii) vehicle shock against guard rails and vehicles stopped on the roadway; and (iii) vehicles falling over and/or overturning. Accidents involving pedestrian hit by cars represented less than 3% of the accidents.
- 5.33 Accidents involving pedestrians hit by cars are not common on the Rodoanel Oeste for the following main reasons: (i) existence of physical barriers and fences that deter unwanted crossings; (ii) existence of five pedestrian overpasses in segments where there is greater urban density, assuring the safe flow of people in both directions; and (iii) there are many segments where urban occupancy occurs only in one of the sides of the roadway, reducing the need for pedestrian crossings. The existing pedestrian overpasses are in adequate conditions for use (with lighting, protective fencing and access ramps for persons with physical disability), and are located at strategic points (e.g., some with direct connection with public transportation system terminals).
- 5.34 Still regarding pedestrian safety, in accordance with the Concession Agreement, the Concessionaire will install six additional pedestrian overpasses with the same adequate characteristics as the existing ones. The location of one of these overpasses has already been defined and will be next to the Vista Alegre community near tunnel 3, located close to the intersection with Regis Bittencourt Highway in Embu. The location of the other five overpasses will be defined according to a demand study to be developed by the Concessionaire and coordinated by ARTESP<sup>(3)</sup>.
- 5.35 Besides the implementation of the additional pedestrian overpasses, the Concessionaire is responsible for the maintenance and adequacy of traffic signals and safety devices to ensure their proper use, allowing better traffic flow and greater safety for cars and pedestrians, through signs, road marks, light control equipment, video cameras, auxiliary devices, etc.
- 5.36 *Public safety risks for road users.* The Concessionaire shall provide the conditions to facilitate the execution of public safety activities that are deemed necessary to prevent and repress crime and vandalism in the Rodoanel Oeste ROW. Road patrolling is carried out by the State Highway Police (a responsibility of public authorities). On the other hand, the Concessionaire is responsible for the implementation and rehabilitation of installations used for inspection, and traffic and transportation patrol. The Concession Agreement foresees the need for conservation and maintenance of lighting systems outside the toll plazas, weigh stations, Highway Police stations, impoundment yard, intersections, tunnels, and frontage roads. All existing pedestrian overpasses shall be completely lit, in accordance with the Concession Agreement.

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(3) According to the ARTESP standards, the need for pedestrian crossings is evaluated by an independent team hired by ARTESP, and the implementation of a pedestrian overpass is recommended when the number of crossings is greater than 80 during peak hours. In addition to this criterion, statistical data regarding accidents with pedestrians are analyzed to determine the need for new pedestrian overpasses.

- 5.37 *Impact of tolling on traffic in secondary roads.* The Concessionaire assumed operation of the road in June 2008 and tolling started in December 2008. The traffic data registered during this period have been used to compare with data obtained after tolling started to assess the effect of tolling on the Rodoanel Oeste traffic, and potential consequences on secondary roads that possibly could be used as escape routes. The data were further adjusted to take into account seasonal factors such as summertime and end-of-the year holidays.
- 5.38 The comparison of the vehicle count data for the two periods indicated a drop of only 2.6% on average daily traffic (ADT) as a result of the initiation of toll plaza operation. Furthermore, the analysis performed indicates a tendency during the tolled period for vehicles that had previously “migrated” to other roads to come back to the Rodoanel Oeste, apparently after evaluating that there is no gain in terms of time and costs by avoiding the tolled road. Therefore, the assessment performed indicates that there has been no significant impact of tolling on the Rodoanel Oeste traffic and, consequently, on the traffic on parallel, adjacent and/or secondary roads in the area of the Project.
- 5.39 One of the main factors that helps to explain why users are not attracted to possible escape routes in the case of the Rodoanel Oeste is the relatively low value of the toll tariffs applied (basic toll is R\$ 1.20, or around USD 0.60). Users tend to compare the tariff and ride on the Rodoanel Oeste with the additional fuel costs and loss of time associated with using alternative routes. Furthermore, the design characteristics of the Rodoanel Oeste make for safer and more comfortable traffic conditions compared to in other roads in the region. In addition, the automatic tolling is another factor that is favored by the road users.

### ***C.3 Health and Safety***

- 5.40 *Worker Accidents.* The main health and safety issues related to operation and conservation activities are: (i) carbon monoxide exposure, mainly for toll plaza workers, (ii) exposure to excessive noise; (iii) fatigue associated with exhausting work (for example, night shift), and osteomuscular diseases; and (iv) risk associated with contact with electric systems. Additional risks are: (v) worker exposure to chemical agents during maintenance work (oil, grease, lubricants, paint, solvents); (vi) worker exposure to hazardous materials (flammable liquids); (vii) risk of being hit by a car; and (viii) risk of fall caused by difference in level.
- 5.41 Brazilian and state of São Paulo occupational health and safety are very strict and comprehensive and enforcement is effective. The Concessionaire has in place procedures to adequately manage the issues and risks referred to above and in accordance with regulations. Some of the procedures adopted are the following: (i) monitoring of risks; (ii) use of appropriate signage in the workplace; (iii) use of personal protective equipment (“PPE”), as needed; (iv) training on health and safety issues; (v) use of subterranean passageways between toll booths, to reduce risk of workers being hit by cars; and (vi) rotation system for the toll booth workers, as air quality may vary from one booth to the other.

**D. Potential Risks and Liabilities Associated with the Existing Road Prior to the Concession**

- 5.42 Besides the impacts described in the previous sections, indirectly related to the Project being considered for possible financing by IDB, there may be some potential environmental and social liabilities and/or reputational risks associated with possible pending issues or improper mitigation of construction and operation-related impacts by the public sector prior to the Concession. However, these risks are expected to be limited as the road project has been developed and implemented under close and strict scrutiny of the State Environmental Authorities (SMA, CETESB), local governmental authorities and civil society, and designed and constructed using modern engineering techniques.
- 5.43 *Expropriations and resettlements.* Approximately 1600 families had to be resettled for the construction of the Rodoanel Oeste, implemented by DERSA, and most of these cases involved precarious and illegal housing. To properly and timely address the issue, DERSA developed and implemented a Relocation Support Program and a Resettlement Plan. Both of the plans were developed based on Involuntary Resettlement Guidelines adopted by multilateral financing institutions. The families have been resettled in three new residential complexes constructed for the purpose near the project area. Information obtained with DERSA and the State Environmental Department during the Environmental and social Due Diligence (ESDD) indicates that: (i) the actions were adequate and there has been no report of any family not being properly assisted; (ii) all resettlement issues related to the construction of the Rodoanel Oeste have been resolved; and (iii) the state company developed and implemented a Resettlement Plan according to good practices and the plan has been subsequently used as a reference in other projects.
- 5.44 *Encroachment (illegal occupation) of the ROW.* Before assuming the operation of the Rodoanel Oeste the Concessionaire performed a survey to detect any instance of illegal occupation of the ROW. The survey indicated two cases of apparent illegal occupation involving very precarious housing. The Concessionaire is contracting topographic services to perform the correct demarcation of the ROW in these areas (100 or 130 meters). If the occupation of ROW area is confirmed, along with their actual extension, a social survey of these occupations and families will be performed through a specialized company hired by the Concessionaire.

**E. Issue Associated with Other Relevant Project**

- 5.45 The implementation of the Rodoanel Oeste did not cause any direct or indirect impact on Indigenous Peoples. Similarly, the works and activities involved in the Concession are not expected to cause any direct or indirect impact on these types of communities. Nevertheless, as a result of negotiations of the GoSP, DERSA and the National Indian Foundation (“FUNAI”) in relation to the South Section of the Rodoanel Mário Covas, the Granting Authority established that the Concessionaire will have to allocate financial resources to DERSA, to reimburse the state-owned company for the purchase of lands for the expansion of the area of the Jaraguá Indigenous Settlement in another region of the MRSP.
- 5.46 During the environmental licensing process of the implementation of the Rodoanel Oeste, based on the information contained in the environmental impact studies prepared and on

various inspections conducted by the licensing authorities, no direct or indirect impacts were identified in relation to the Jaraguá Indigenous Settlement. This information has been confirmed by the State Environmental Department (SMA), which issued all environmental licenses, without the imposition of conditions or requirements concerning the Jaraguá Indigenous Settlement. The environmental records related to the construction phase of Rodoanel Oeste do not indicate any direct or indirect deleterious consequences to the Indigenous Settlement. In addition, the information gathered during the ESDD, through meetings with competent authorities and field inspections, confirmed the lack of evidences of direct or indirect impacts of the Rodoanel Oeste on the Jaraguá Indigenous Settlement. As indicated in **Section IV.C.8**, natural geographic barriers and the lack of direct access roads or connections make for the effective isolation of the Settlement from the Rodoanel Oeste.

- 5.47 The requirement of fund allocation for the expansion of the Jaraguá Indigenous Settlement is connected with the licensing process for the South Section of the Rodoanel and a Legal Agreement signed between the Federal Prosecutor's Office, DERSA and the Government of the State of São Paulo, which covers many aspects, including the performance of ethno-ecologic studies for two Indigenous Settlements located in the general area of the South Section of Rodoanel (Krukuto and Barragem Settlements). FUNAI, which is involved in the licensing process regarding the South Section, understood that there would be indirect impacts affecting those two Indigenous Settlements (Krukutu and Barragem). Ethno-ecologic studies sponsored by DERSA were conducted for both Settlements, resulting in monetary compensation proposals, after proper consultations with those communities.
- 5.48 During those negotiations, FUNAI and the Federal Prosecutor's Office understood that those benefits should also be expanded to consider the Jaraguá Indigenous Settlement, as it is composed of individuals of the same ethnicity as those at Krukutu and Barragem Settlements (i.e., Guarani) and is also located in the MRSP. DERSA, in common agreement with the Federal Prosecutor's Office, defined a clause that sets forth the allocation of specific funds for the Jaraguá Settlement; funds that shall correspond to the maximum compensation amount defined for the other two Settlements. Later, an amount of R\$ 2 million (around USD 1 million) has been established and it will be used for the purchase of lands for the Jaraguá Indigenous Settlement. Consultations and negotiations are currently under way between DERSA, FUNAI and the Jaraguá community, to define where they want to expand. Preliminary information indicates that the indigenous community prefers to expand to a more isolated and secluded region of the MRSP. It should be emphasized that the Concessionaire is not part of the negotiations and consultations.

## **F. Potential Positive Impacts and Benefits**

- 5.49 Some of the main benefits of Rodoanel Oeste are associated with the justification for its implementation, namely (i) divert through traffic from the center of the MRSP (the capital city, São Paulo), especially that of heavy vehicles; (ii) improve connection between MRSP communities, facilitating circulation between them, without the need to use the city's main road system; and (iii) optimize future regional cargo and passenger transportation. The improvement of urban road traffic circulation in the MRSP, and the displacement of long-distance trips contribute to reduce the number of traffic congestions, the emissions of combustion gas, and the number of accidents in densely populated areas.



- 5.50 Improved efficiency of the State transportation system is the main objective of Rodoanel, but its beneficial effects have broad coverage and spread all over the MRSP as well. The benefits on urban road circulation are also spread out and distributed all over the metropolitan area, with different levels of influence, depending on the local and regional road connections with the highway. Rodoanel should absorb through traffic, transposition trips with the origin or destination in the MRSP, as well as internal long distance trips with the origin and destination within the MRSP. The cargo transportation and individual passenger transportation is helped by the reordering of internal traffic flow, and frees space in the local and metropolitan roadways, altering the traffic flow conditions, reducing congestion, increasing the average traffic speed and decreasing traveling time.
- 5.51 Traffic studies performed after some years of operation of the Rodoanel Oeste indicate that the freeway effectively contributes to improve traffic flow and reduce both total travel time (vehicle-hour per day) and total travel distance (vehicle-kilometer per day) of road users in the MRSP; consequently, contributes to reduce also fuel consumption and air pollutant emissions from vehicles that would be in stop-and-go or idling traffic.
- 5.52 Also, the Rodoanel Oeste contributed to a reduction in the heavy-load traffic flow into the MRSP, including that transporting hazardous materials; thereby providing better traffic conditions for mass and individual transportation in the MRSP. For instance, some studies indicate that as a result of the operation of the Rodoanel Oeste, the heavy-load traffic in some of the most important highways in the capital (the *Marginal* Avenues) has decreased by 30%.
- 5.53 The improvement in traffic flow allow less stressing travel conditions and enhancement of well-being and quality of life of people, and contributes to the abatement of noise and reduction in air pollutant emissions in the MRSP from vehicles that would be in stop-and-go or idling traffic.
- 5.54 It is particularly relevant to note also the contribution of infrastructures such as the Rodoanel Oeste to control climate change by reducing greenhouse gas (“GHG”) emissions from vehicles that would be in stop-and-go or idling traffic. Also important to note is the potential reduction in the emissions of other important GHGs such as methane (CH<sub>4</sub>). It should be pointed out that on a long-term assessment basis, a molecule of CH<sub>4</sub> has about 23 times the effect of CO<sub>2</sub>.
- 5.55 The Concessionaire is developing studies and hired a specialized company to assist it in the development of a GHG inventory, to qualify and quantify the emission reductions associated with the utilization of the Rodoanel Oeste. Preliminary results indicate a reduction in CO<sub>2</sub> emissions on the order of 1 million ton of CO<sub>2</sub> per year in association with the operation of the Rodoanel Oeste. The continuation of these studies shall be followed by IDB.
- 5.56 It is also important to note that the freeway contributes to lower the risks of traffic accidents in densely populated areas, which is an impact that can be particularly relevant in case of vehicles transporting hazardous materials.
- 5.57 Another relevant benefit associated with the Concession is the generation of direct jobs, particularly for the operation of the toll plaza booths (around 440 new openings). It should be pointed out that the Concessionaire has a policy of hiring and training local inhabitants to

fulfill these openings. The benefits on the economic conditions of the neighboring communities are clear as other indirect jobs may also need to be created to serve the demands of the Concessionaire's workers.

## **VI ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY MANAGEMENT**

### **A Environmental and Social Monitoring Programs**

#### ***A.1 Construction Phase***

- 6.1 *Environmental Monitoring.* According to the Concession Agreement, the Concessionaire has to perform adequate environmental control activities, adopting measures to avoid or mitigate environmental impact during construction. Monitoring of some environmental aspects will be essential to detect impacts. The monitoring actions during construction will involve monitoring of surface water quality (in streams and rivers that may be affected by construction activities), noise levels (close to urban areas or community buildings, such as schools), and of other aspects.
- 6.2 *Solid Waste Management.* Civil construction waste (according to specific legislation) may be kept in a waiting area (for a maximum of 90 days), if needed. Subsequently, the wastes need to be sent to an adequate destination according to the type of waste, taking advantage of reuse (for wood, for example) or recycling (plastics). The Concessionaire will monitor the solid wastes generated during construction to help ascertain the proper destination for each type.

#### ***A.2 Operation Phase***

- 6.3 *Monitoring environmental liabilities.* The Concessionaire will periodically perform a detailed assessment of environmental liabilities associated with the current system, like erosion, abatement and siltation processes, and irregular occupancy on the ROW.
- 6.4 *Monitoring noise levels.* Preventive, mitigation and monitoring measures regarding noise deriving from the operation of the system shall comply with provisions contained in Brazilian and State of São Paulo regulatory standards. In case of the occurrence of environmental problems associated with harmful effects of the noise generated by the road traffic on nearby communities, the Rodoanel Oeste Concessionaire will be responsible for covering the costs related to measurements and specific studies of noise levels conducted by competent agencies or the Granting Authority, as well as measures that may be established by these specific studies.
- 6.5 *Monitoring of cleanness of ROW.* The Concessionaire conducts periodic inspections to detect and remove, if necessary, solid wastes (especially litter, rubble, debris, etc.) that may exist on the ROW and at intersections. Normally, dead animals found on traffic lanes and ROW are buried. If the carcass is from an animal considered as belonging to an endangered species, it is sent to research institutions, whenever feasible.

## **B Health and Safety Monitoring**

- 6.6 *Monitoring of health and safety issues.* The Concessionaire is still structuring its Health and Safety Management System. The system involves the development of monitoring activities of issues regarding risk and hazards to employee health and safety. These activities involve also monitoring records of accidents and issues associated with occupational health. In addition, the Company will develop environmental risk monitoring activities for effective control, in accordance with regulatory standards. This involves the adoption of a system of investigation and analysis of accidents and incidents, as well as monitoring of corrective actions recommended in the adopted health and safety management programs. Health and safety management programs, risk management, and emergency plans shall be periodically audited to verify their effectiveness.

## **C Contingency Plan**

- 6.7 The Concessionaire is adopting risk management and emergency plans that were developed and implemented by DERSA for the Rodoanel Oeste. The main objective of the Risk Management Program (“PGR”) is to establish management actions for total control of activities regarding the transportation of hazardous products, with preventive measures, aiming to avoid environmental accidents involving the spilling of chemical substances, and minimize possible environmental impact if an accident takes place.
- 6.8 Actions aiming at reducing the consequences of accidents, particularly those involving vehicles transporting hazardous materials, are included in the Emergency Action Plan (“PAE”), which is considered an integral part of the PGR. The PAE for Rodoanel operations includes corrective aspects of risk management, based on the assumption that the consequences will tend to be lessened the faster is the corrective intervention. Included in PAE are emergency procedures to identify the nature of the situation, immediate actions to be taken and communication with competent authorities, as well as emergency support actions. It should be noted that the adoption of corrective actions (cleaning) in case of accidents involving hazardous materials is a responsibility of the competent authorities (CETESB, Civil Defense, Fire Department) and not of the Concessionaire. However, the Company shall facilitate the actions that need to be carried out by the public agencies.

## **D Environmental, Health and Safety Management System**

- 6.9 Based on the work performed in the environmental and social due diligence (“ESDD”), the Project Team confirmed that the Company has in place procedures and control measures to manage the environmental, social, health and safety impacts and risks associated with Project. Therefore, the Team considers the Project to be feasible and have not identified any risk factor that cannot be mitigated and represent a risk to the environmental sustainability of the operation with IDB.
- 6.10 Nevertheless, the Team identified a few areas that can be improved regarding the Project and the Company’s capacity to manage environmental, social, health and safety aspects that will be addressed through an environmental, health and safety action plan requested by the Bank.

- 6.11 Following IDB's recommendations the Concessionaire intends to develop an Environmental and Social Management System, and a Health and Safety Management System, which, in this case, the Company is opting to develop both in an integrated system ("SGASS"). This system will be based on the principles of the ISO 14001 and OHSAS 18001 international standards, even if certification of the system is not intended in a first moment. The SGASS will incorporate all environmental and social conditions and requirements set forth by IDB, as well as by the Environmental Authorities, as well as others which may come to be identified through specialized consulting during the development of the system.
- 6.12 The SGASS will also include the definition of functions and responsibilities of those involved in environmental, social, health and safety issues in the ViaQuatro organization, including incorporating the responsibilities in their corresponding job descriptions.
- 6.13 The Concessionaire is currently using management procedures and tools developed and implemented for another of CCR's previous road concessions, the ViaOeste (Castello-Raposo).

#### ***D.1 Environmental and Social Management System***

- 6.14 The basic guidelines of the Concessionaire's Environmental and Social Management System will be driven by the following principles: (i) ensure compliance with IDB's environmental and social requirements and in-country regulations; (ii) improve the well-being and satisfaction of all employees and served communities, through the development and continuous improvement of best practices in environmental management; (iii) control environmental risks, reducing them to lowest level possible through the use of effective and efficient programs, technologies and procedures; (iv) contribute, through the incentives and technical support and/or formal requests for selection/hiring, to the gradual improvement in the environmental performance of contractors and suppliers, and to the development of their activities on a sustainable basis and in compliance with the applicable legislation; (v) raise awareness about the direct and indirect environmental risks/impacts associated with the Concession activities; and (vi) communicate with total transparency to employees and communities in general about the environmental and social impacts and risks associated with the Concession.

#### ***D.2 Health and Safety Management System***

- 6.15 The Concessionaire will detail health and safety procedures, standards, guidelines and programs in line with IDB's requirements, in-country regulations and OHSAS 18001 (international health and safety management standard). The system will include the following: (i) a safety policy; (ii) annual targets and action plans to mitigate risks; (iii) empowerment and responsibilities; (iv) employee training; compliance with the applicable legislation, regulations and standards; (v) risk management process; accident and incident investigation and assessment system; (vi) system to collect and analyze safety performance information; and (vii) system for the development, approval and monitoring of corrective actions.
- 6.16 As required by applicable Brazilian health and safety regulations, Environmental Risk Prevention Plans ("PPRA") and Occupational Health and Medical Control Programs ("PCMSO") shall be presented. The PPRA shall contain: (i) identification and

characterization of environmental risks; (ii) definition and implementation of control measures; (iii) training; (iv) continuous monitoring of risk exposure; (v) procedures for investigation of accidents; (vi) continuous improvement and assessment procedures; (vii) corrective action plans (“PAC”) if needed; and (viii) registration and communication of data and information.

- 6.17 Also according to regulatory standards, the Company will also create an Internal Accident Prevention Commission (“CIPA”), who will coordinate the execution of the corrective actions. The person responsible for occupational safety will periodically present a summary of the issues addressed in all CIPA meetings; statistics of accidents; assessment of accidents; aspects of the PPRA that are being assessed; training activities applied during the period; PAC implementation status.

### ***D.3 Environmental and Social Responsibility***

- 6.18 The Concessionaire will also operate with responsible and committed attitude towards environmental and social sustainability, as currently observed with other concessionaries under CCR administration (one of the main shareholders of the Concessionaire). This performance involves projects and programs in the area of social, cultural, sports and environmental responsibility. The purpose is to contribute to the development of the communities neighboring the Rodoanel Oeste, as well as with other civil society institutions that may interact with the Company.
- 6.19 Currently, the Company is carrying out a program to improve and maintain a good relationship with the neighboring communities (Community Relationship Program). This program aims at bringing Company managers closer to the local communities, so that together they can find solutions for a peaceful and constructive coexistence of the road and the communities. This program includes: (i) institutional actions (*Estrada Para Cidadania, Cine Tela Brasil, Circo Roda Brazil*); (ii) social actions (*Dia da Limpeza* – aiming at cleaning domestic wastes on the ROW; *De Mãos Dadas* – aiming at promoting the crossing of the highway using the pedestrian overpasses); (iii) educational actions (lectures and presentations about sexually transmitted diseases, and making the community aware of risks of children getting hit by cars).
- 6.20 The Social Work Techniques Project is also part of the Community Relationship Program, which consists of the development of a social action plan geared towards increasing the awareness of neighboring communities in relation to environmental issues.

## **VII PUBLIC CONSULTATION**

- 7.1 During the implementation phase, the Rodoanel Oeste project was submitted to a regular environmental licensing process for projects considered to be modifiers of the environment. This process required the presentation and approval by the São Paulo State Environmental Department (SMA) of an Environmental Impact Study (“EIA”) and respective Environmental Impact Statement (“RIMA”).

- 7.2 The licensing process was conducted with ample communication and information made available to the community to be directly or indirectly effected by the construction. The following aspects should be highlighted:
- (i) communication through large circulation newspapers of the start of licensing processes and of the environmental studies, as well as the issuance of Preliminary License and Installation License for the project;
  - (ii) EIA/RIMA placed available at SMA and DERSA for public consultation;
  - (iii) implementation, by DERSA, of Rodoanel Information Centers, in Osasco and in Embu, to serve the region's population, mainly regarding expropriations;
  - (iv) public hearings were held; and
  - (v) DERSA maintained also a channel of information through the internet website (<http://www.dersa.com.br/rodoanel/especial/index.html>); and through telephone services and a specific channel with an ombudsman (*Disque Rodoanel*).
- 7.3 Although by national and state legislation an EIA and respective RIMA were not required in the case of the Project (the Concession), the Bank requested the Company to present an Environmental Analysis Report ("RAA") to address potential relevant environmental and social impacts, as well as the correspondent control measures (monitoring and mitigation) associated with the Project being considered for financing by the Bank. This environmental impact assessment report has been disclosed to the public in accordance with IDB's Operational Policy OP-102 - Disclosure of Information, locally, at IDB's Public Information Center in Washington, DC and at the Country Representative Office.
- 7.4 In this regard, the Company adopted the following methods of communicating information on the RAA to the public:
- (i) Publication of announcements for three consecutive days in wide circulation newspapers in the State of São Paulo indicating the completion of the RAA and the location for consultation of the document;
  - (ii) Making the RAA available to the public at the highway user service and also in easily accessed locations for the general public (gas station at Shopping Center Tamboré) as well as publication on the CCR website (<http://www.grupoccr.com.br/rodoanel>);

## **VIII RECOMMENDATIONS**

- 8.1 IDB will require as part of the Loan Agreement that the Company and all portions of the Project shall, at all times during the life of the Loan Agreement, comply with each of the following:
- 1. All applicable environmental, health and safety Brazilian regulatory requirements and all applicable IDB's environmental and social policy and requirements.
  - 2. All requirements associated with any environmental, health and safety related permits, authorizations, or licenses that apply to the Project or the Company.
  - 3. All environmental, health and safety requirements of the Project contracts, and any subsequent modifications.

4. All aspects and components of all of the Project environmental, health and safety documents.
  5. Applicable aspects of the World Bank General Environmental Guidelines (Pollution Prevention and Abatement Handbook, 1998).
  6. Applicable aspects of the World Bank Monitoring Guidelines (Pollution Prevention and Abatement Handbook, 1998).
  7. Applicable aspects of the International Finance Corporation Health and Safety General Guidelines (2007).
  8. Consult with IDB before approving or implementing any and all substantive changes to the Project or its timetable that could potentially have negative environmental, social, or health and safety effects.
  9. Send written notice to IDB of any and all non-compliances with any environmental, social or health and safety requirement of the Loan Agreement and any significant environmental, social, or health and safety accident, impact, event, claim or material complaint.
  10. Ensure that all companies contracted for construction and operation activities comply with the applicable environmental, social and health and safety requirements of the Loan Agreement.
  11. Implement ongoing information disclosure and consultation activities related to environmental, social, and health and safety aspects of the Project, including, if applicable, information from environmental and social, health and safety monitoring reports prepared by external consultants, in compliance to Bank's OP-102 Disclosure of Information Policy.
  12. Implement and/or maintain Environmental and Social, and Health and Safety Management Systems that are consistent with the principles of ISO 14001 and OHSAS 18001.
- 8.2 Prior to Financial Closure the Company shall submit an environmental, health and safety action plan ("EHSAP"), in form and substance satisfactory to IDB, properly addressing the environmental, social, health and safety improvement recommendations, as well as any relevant pending non-compliance and/or liability associated with the Project or the Company. This Action Plan shall clearly address the following aspects:
1. The proposed actions, programs and plans to be adopted to improve environmental, social, health and safety management procedures, and correct any pending non-compliance and/or liability, including: (i) continue to comply with all applicable Brazilian environmental, health and safety regulations, and all applicable IDB's environmental and social requirements; (ii) develop and implement formalized and structured Environmental and Social and Health and Safety Management Systems to encompass the project and the activities of the entire Company; (iii) promote the up-streaming of responsibilities and accountability regarding environmental and social issues to upper management level; and (iv) provision of adequate environmental staff to better address environmental and social issues.
  2. A time schedule for implementing such proposed actions, programs and plans, including due dates and key milestones.
- 8.3 Prior to each disbursement, the Company shall certify compliance with all environmental social, and health and safety requirements in the Loan Agreement.

- 8.4 During the life of the Loan Agreement, the Company shall present, in form and substance satisfactory to IDB, the applicable documents, reports and plans indicated in the EHSAP, and prepare and submit Environmental and Social Compliance Reports (“ESCR”), in form, substance and frequency satisfactory to IDB.
- 8.5 The Bank will monitor the environmental, social, health and safety aspects in the Loan Agreement via internal Bank supervision actions (e.g., site visits, review of documentation) and will contract an external independent Environmental and Social Consultant to perform more detailed supervision/monitoring actions during the life of the Loan Agreement. In addition, the Bank will have the right, as part of the Loan Agreement, to contract for the performance of independent environmental, health, and safety audits, if needed.



# Annex 1: Project Location Map

## Rodoanel Oeste

### São Paulo

### Brazil

