

## TC PROFILE

June 9, 2004

### I. BASIC PROJECT DATA

<b>Country:</b>	Brazil		
<b>Project number:</b>	TC-9811896		
<b>Country team:</b>	Ricardo Pinheiro (RE1/FI1) Project Team Leader; Paula Giraldez (LEG/OP1); Pablo Peña (COF/CBR); David Stevens (Consultant RE1/FI1); and Haydemar Cova (RE1/FI1).		
<b>Date of Request:</b>	October 18, 2001		
<b>Beneficiary:</b>	Ministry of Transportation (MT)		
<b>Executing Agency:</b>	Inter-American Development Bank (IDB). The MT, through the National Transportation Policy Secretariat ( <i>Secretaria de Política Nacional de Transporte (SPNT)</i> ) will act as co-executing agency of the Program.		
<b>Financing Plan:</b>	IDB - Japanese Trust Fund for Consultancy Services (JCF):		US\$750,000
	Local Counterpart, in kind contribution:		<u>US\$175,000</u>
	Total:		<u>US\$925,000</u>
<b>Technical and Basic Responsibility:</b>	Finance and Basic Infrastructure Division 1 (RE1/FI1)		
<b>Tentative dates:</b>	Loan Committee/EVP		July 2004
	DIR/PRE		July 2004

### II. BACKGROUND AND PROBLEM STATEMENT

- 2.1 The Ministry of Transportation (MT) is responsible, at the national level, for the development of transportation planning studies. In the development of these studies the MT is increasingly using solutions that build upon geographic information technologies to improve the outreach, the efficiency and the timeliness of the studies developed. At the moment, the MT is seeking to incorporate planning methodologies that take advantage of and build upon the analytical tools now available with Geographic Information Systems (GIS)<sup>1</sup> to support the development of strategic studies, the development of impact studies of transportation projects and also to allow the consolidation in one database of all the information relevant to the area of regional transportation planning (including not only transportation infrastructure but also transportation services).

---

<sup>1</sup> A collection of computer hardware, software, and geographic data for capturing, storing, updating, manipulating, analyzing, and displaying all forms of geographical referenced information.

- 2.2 In addition to the MT, several other government agencies involved in transportation planning and/or transportation policy are also incorporating the use of solutions that build upon the use of geographic information technologies, including the National Department for Transportation Infrastructure (*Departamento Nacional de Infra-estrutura de Transportes (DNIT)*), the National Land Transportation Agency (*Agência Nacional de Transportes Terrestres (ANTT)*) and the National Water Transportation Agency (*Agência Nacional de Transportes Aquaviários – (ANTAQ)*). At the same time, various government agencies responsible for the transportation sector at the state level are also developing information technology solutions for transportation planning and management, which is leading to a significant increase in the amount of transportation information available.
- 2.3 In view of these needs, the MT has requested support from the Bank to enhance its present capabilities in the area of geographic information technologies. By bringing all transportation information together the MT will be able to consolidate one national transportation spatial database, which will then be made available to all interested users, including the Bank for the various transportation projects currently in the pipeline, and also to the general public. By incorporating a solution based on GIS the MT will have added analytical tools to develop the studies it is responsible for.
- 2.4 In planning processes where not only funds, but also the data available to base decisions on are limited, geographic information technologies (encompassing GIS, Remote Sensing, and Global Navigation Satellite Systems (GNSS), such as the Global Positioning System (GPS)), offer supporting tools for improved and effective decision-making. GIS-based solutions provide analytical capabilities that can support a number of transportation planning and management related activities such as regional analysis of multi-modal transportation solutions, corridor selection, decisions that relate to maintenance and upgrading of transportation infrastructure, social and environmental impact analysis, and concession studies. Satellite imagery provides needed data to quickly update regional maps and transportation networks. GPS technology provides the means to capture geo-referenced data of existing pavement conditions and the possibility of developing tracking systems, much needed for highway safety.
- 2.5 In developing countries and, to a certain extent, even in relatively more developed countries, fully operational GIS systems integrated into decision-making processes were until recently often limited or nonexistent. The private sector often has a key role in real estate development, marketing and commodity transport, but it is primarily the public sector that carries out and consolidates comprehensive planning activities, including transportation and related infrastructure planning. Increasingly, GIS systems are being successfully implemented due to decreasing costs of computer power and wider availability of digital spatial data, as well as a refocus on planning processes, which recognize the growing need to incorporate environmental and social variables.

### **III. PROGRAM OBJECTIVE AND DESCRIPTION**

#### **A. Program goal and purpose**

- 3.1 The goal of this Program is to improve and broaden the process of planning and decision-making in transportation at the MT. Its purpose is to design, develop and implement planning and management solutions based on GIS. The solutions, once implemented, will also provide the MT with additional analytical tools to support the implementation of transportation projects and a digital database. This database will be available to other public agencies, universities, the private sector, and to the general public, for the development of their own applications.

#### **B. Components**

- 3.2 A consulting firm with a team of international and national experts in developing GIS-based solutions for regional transportation planning and transportation infrastructure management will be identified and contracted to carry out the project. The project will include two phases: i) conceptual design of the system; and ii) system development, data compilation and training.
- 3.3 The two phases are further divided into a total of ten tasks, all to be performed by the consulting team. The first phase includes an introductory seminar, a needs assessment and the development of a conceptual design of the Regional Transportation Planning Information System, the development of a proposal for a National Spatial Data Infrastructure for Transportation Planning and Management (NSDI/TPM), and another seminar to present the reports of the two previous tasks. The second phase includes systems development, data compilation, implementation of solutions, training of the personnel that will use the system, and a wrap-up seminar.
- 3.4 The main system solution to be developed will be the Regional Transportation Planning Information System. It will be a GIS-based solution, which will provide access to all the integrated data together with specific analytical tools, as identified in the need analysis in the first phase of the conceptual design of the system. The analytical tools available will also include network and locational analysis capabilities. To support data management a route calibrator and an event placement support systems will be developed. The route calibrator system will allow the MT to adjust the transportation network relating the spatial information to the real kilometers or to the legal landmarks of the route, tying this information to the real geographic coordinates of each point. The event placement will enable the placement of all events (such as landslides, multi-modal transportation points, and bridges) on the calibrated routes. Also, the following applications will be developed and implemented: i) the GIS-based Decision Support System (GDSS); and ii) a System for Freight and Passenger Flow Generation and Allocation.

#### IV. COST AND FINANCING

- 4.1 The following table presents a summary of the estimated budget.

<b>BUDGET SUMMARY (IN US\$ EQUIVALENT)</b>			
<b>ITEM</b>	<b>TOTAL COST</b>	<b>JCF</b>	<b>LOCAL</b>
Salary Cost			
National and International Professionals	218,000	218,000	
Overhead	239,800	239,800	
Total	457,800	457,800	
Direct Costs			
Travel expenses and Per Diem	125,400	125,400	
PC Workstations and Software	60,000	60,000	
Satellite Imagery	32,000	32,000	
<i>Total Estimated Budget Consulting Firm (A)</i>	<i>675,200</i>	<i>675,200</i>	
Administration Costs			
Specialized Supervisory Consultant	40,000	40,000	
Contingencies (5%)	34,800	34,800	
<i>Total Project Administration Costs (B)</i>	<i>74,800</i>	<i>74,800</i>	
National Administration Costs			
Office Support and Other Costs	75,000		75,000
Counterpart Professional Staff	100,000		100,000
<i>Total Local Administration Costs (C)</i>	<i>175,000</i>		<i>175,000</i>
<i>Total Project Costs to be Financed by JCF (A+B)</i>		<i>750,000</i>	
<b>Total Estimated Budget (A+B+C)</b>	<b>925,000</b>	<b>750,000</b>	<b>175,000</b>

#### V. EXECUTING AGENCY AND EXECUTION STRUCTURE

- 5.1 Taking into account the Donor's Agreement, the Bank will be responsible for the project execution. The Country Office in Brazil (COF/CBR), as the unit with basic responsibility for the administration of this operation, will hire the consulting firm to carry out the project and RE1/FI1 will be responsible for the technical supervision, in coordination with COF/CBR and the MT. RE1/FI1 will be responsible for hiring the specialized supervisory consultant.
- 5.2 The COF/CBR will make disbursements in accordance with a schedule to be negotiated with the consulting firm to be hired, upon acceptance by the Bank. The disbursement period is 18 months and the disbursements will be made upon previous approval by the co-executing agency.

#### VI. MAJOR ISSUES

- 6.1 **Recurrent costs:** Benefits from GIS typically accrue in the medium-term as policies are developed, inter-agency procedures are established, agency coordination is strengthened, users become more sophisticated and data becomes more available. This project is intended to consolidate on-going efforts within the

MT, while establishing a proposal for a national framework, in which this effort will be inserted, avoiding the duplication of efforts through the assignment of responsibilities. The full development of such system is an on-going process, which requires continued government support and demonstration of the benefits. In order to attain sustainability this project will require periodic updates and maintenance of the geographic databases developed. Also, staff will be required to attend continuous training to stay abreast of the latest technological advances, and equipment will have to be maintained and replaced, all of which will result in future costs.

- 6.2 **Lack of inter-agency coordination:** Exchange and integration of diverse geographic data is critical to the successful use of GIS. Without cooperation and collaboration between agencies there is a risk that groups will adopt GIS-based solutions but remain isolated in their use, thereby not gaining the full benefits that result from inter-agency cooperation and the sharing of data.

## VII. ACTION PLAN

- 7.1 The Division RE1/FI1 expects final approval of the document by the Loan Committee in July.

## VIII. ENVIRONMENTAL AND SOCIAL STRATEGY

- 8.1 The proposed project has positive environmental and social implications. It will contribute to the quality of the environmental impact assessments for the regional transportation solutions, currently being developed with Bank participation, as well as to future projects. At the same time, training will be provided during the planned workshops and seminars on the use of the developed applications and the compiled data in carrying out social and environmental analysis.

Approved by: \_\_\_\_\_  
Ricardo L. Santiago, RE1/MGR

Date: \_\_\_\_\_