

BRAZIL
PROGRAM TO MODERNIZE AND WIDEN THE FERNÃO DIAS FEDERAL HIGHWAY
(BR-0162)

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MAPS

1. Location of the Project
2. Longitudinal Development of the Project

Technical information available in the project files

- Typical transversal sections
- Design standards
- General terms of reference for technical supervision and control
- Basic structure of the DNER
- Basic structure of the DER/MG
- Basic structure of the DER/SP
- Detailed socioeconomic evaluation
- Basic criteria for the financial projections

ABBREVIATIONS

EPA	Environmental protection areas
BNDDES	Banco Nacional de Desenvolvimento Econômico e Social [National Bank of Economic and Social Development]
CHDU	Companhia de Habitação e Desenvolvimento Urbano [Housing and Urban Development Company]
EMC	Environmental Management Committee
DER/MG	Departamento de Estradas de Rodagem do Estado de Minas Gerais [Minas Gerais State Highway Department]
DERSA	Desarrollo Rodoviário S.A.
DER/SP	Departamento de Estradas de Rodagem do Estado de São Paulo [São Paulo State Highway Department]
DFRs	Federal Highway Districts
DNER	Departamento Nacional de Estradas de Rodagem [National Highway Department]
EIA	Environmental impact assessment
FEAM	Fundação Estadual do Meio Ambiente - Minas Gerais [Minas Gerais State Foundation for the Environment]
HDM-3	"Highway Design and Maintenance Model"
IBAMA	Instituto Brasileiro de Meio Ambiente [Brazilian Environmental Institute]
ICMS	Turnover tax on goods and services
IPVA	Tax on motor vehicle ownership
OC	Ordinary capital of the Bank
PMACI	Plan for the Environment and Indigenous Communities
PNV	Plano Nacional de Viação [National Transportation Plan]
RIMA	Relatório de Impacto no Meio Ambiente [Environmental impact statement]
SEAIN	Secretaria do Assuntos Internacionais [Secretariat of International Affairs]
SEMA	Secretaria do Meio Ambiente - São Paulo [Secretariat of the Environment - São Paulo]
FSO	Fund for Special Operations
SIAF	Integrated Financial Administration System
SNV	Sistema Nacional de Viação [National Transportation System]
STN	Secretariat of the National Treasury
EIRR	Economic internal rate of return

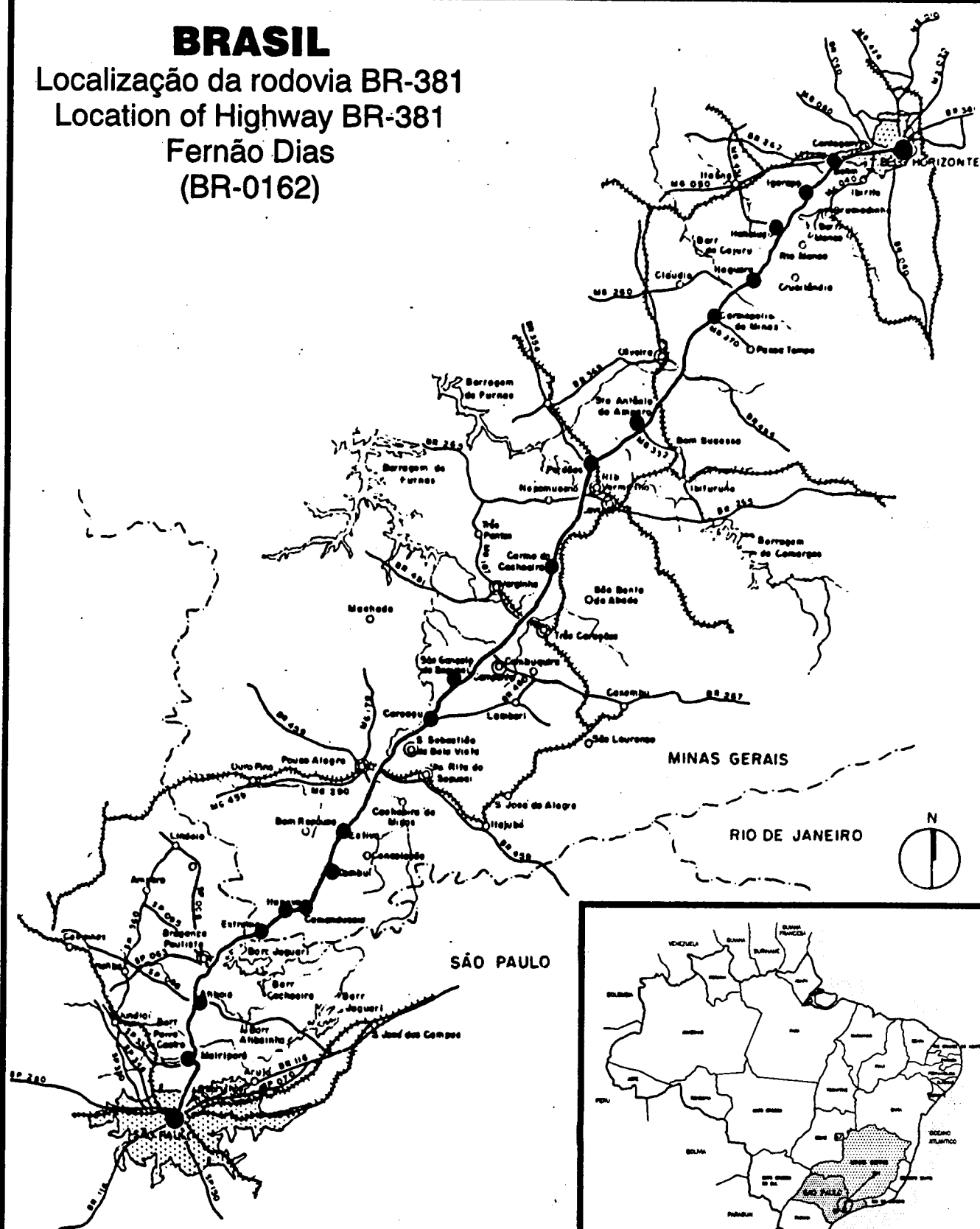
BRASIL

Localização da rodovia BR-381

Location of Highway BR-381

Fernão Dias

(BR-0162)



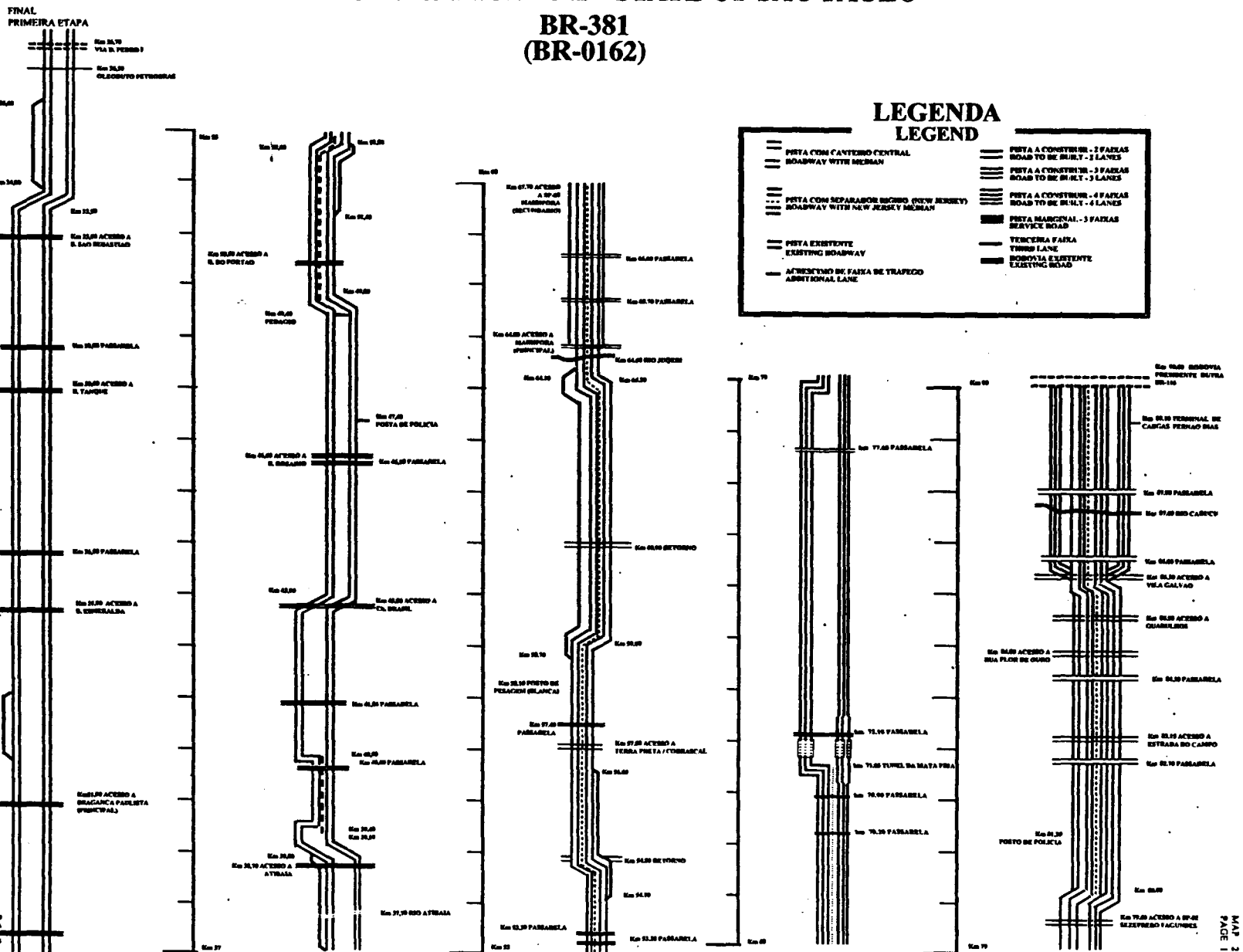
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ESTRADA FERNÃO DIAS - ESTADO DE SÃO PAULO FERNÃO DIAS HIGHWAY - STATE OF SÃO PAULO

BR-381
 (BR-0162)


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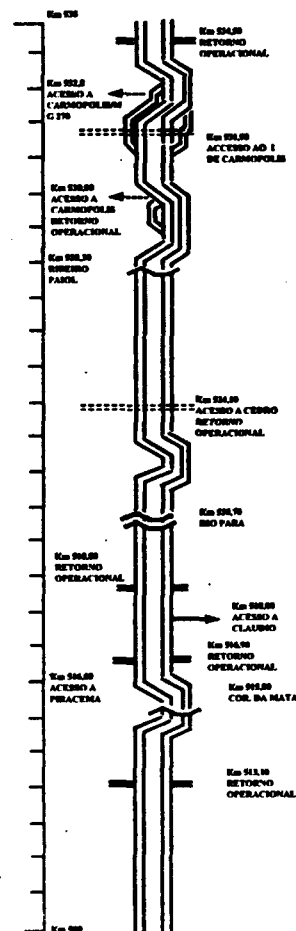
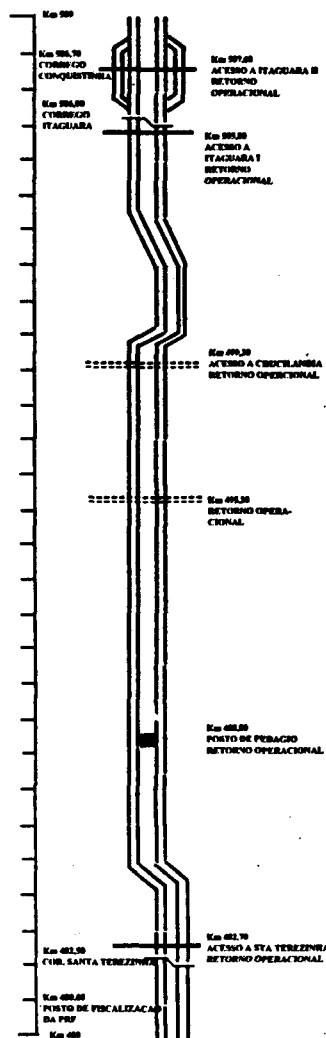
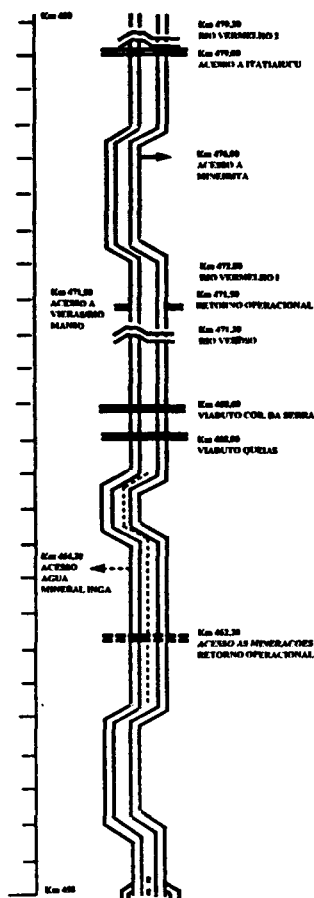
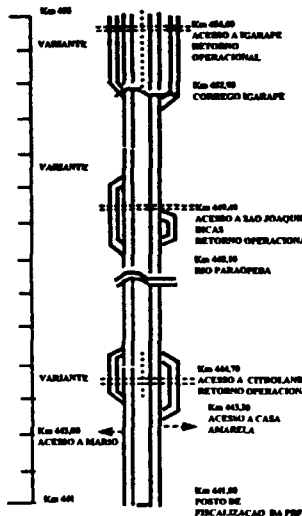
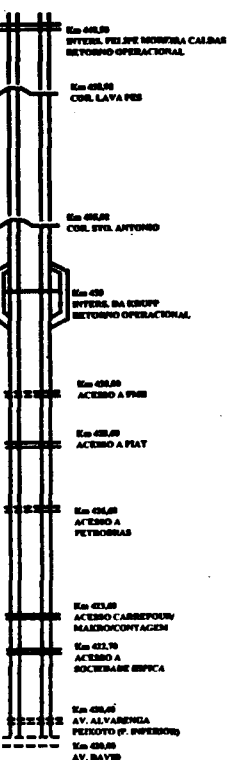
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==	PISTA COM SEPARADOR BORDO (NEW JERSEY) ROADWAY WITH NEW JERSEY MEDIAN	==	PISTA A CONSTRUIR - 3 FAIXAS ROAD TO BE BUILT - 3 LANES
==	PISTA EXISTENTE EXISTING ROADWAY	==	PISTA A CONSTRUIR - 4 FAIXAS ROAD TO BE BUILT - 4 LANES
==	ADICIONAMENTO DE FAIXA DE TRAFEGO ADDITIONAL LANE	==	PISTA MARGINAL - 3 FAIXAS SERVICE ROAD
		==	VERGUEIRA FAIXA THIRD LANE
		==	RODOVIA EXISTENTE EXISTING ROAD



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ROADWAY WITH NEW JERSEY MEDIAN</p> <p>== PISTA EXISTENTE
EXISTING ROAD</p> <p>== PISTA A CONSTRUIR - 2 FAIXAS
ROADWAY WITH 2 LANE</p> | <p>== PISTA MARGINAL - 2 FAIXAS
SERVICE ROAD - 2 LANE</p> <p> POSTO DE PEDAGIO
TOLL STATION</p> <p>→ ACESSO
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UNDERPASS</p> <p>== VIADUTO
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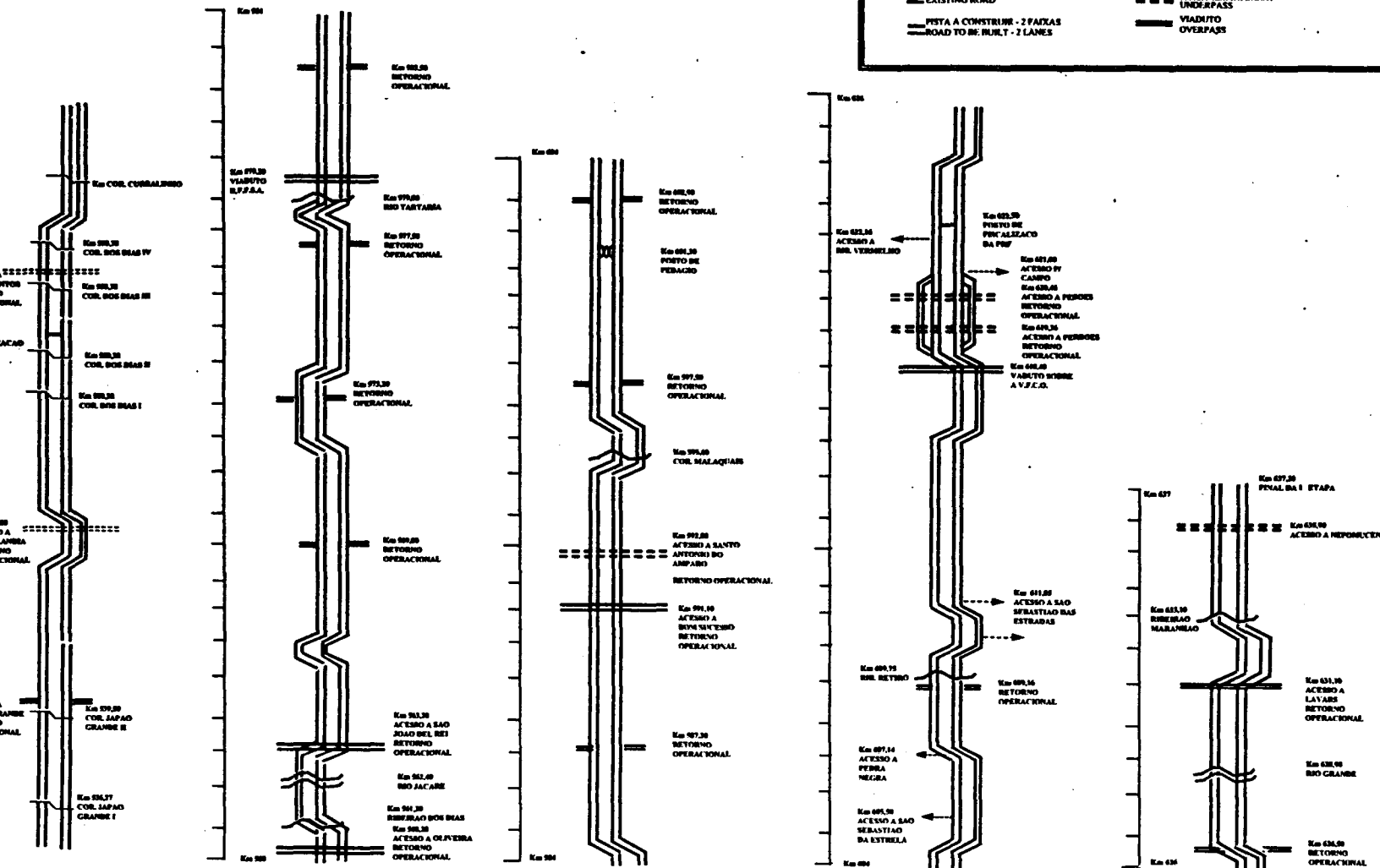


ESTRADA FERNÃO DIAS - ESTADO DE MINAS GERAIS FERNÃO DIAS HIGHWAY - STATE OF MINAS GERAIS

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LEGENDA LEGEND

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ROAD TO BE BUILT - 2 LANES | == RETORNO
RETURN |
| | == PASSAGEM INFERIOR
UNDERPASS |
| | == VIADUTO
OVERPASS |



BRAZIL

Basic Socio-Economic Data
Statistics and Quantitative Analysis
Economic and Social Development Department

Executive Summary

Social Statistics

Land Area (Km2)	1992	8,456,508
Population (Thousands)	1992	154,105
Population (Average Annual Growth Rate)	1983-1992	2.0
Rural (Percent)	1992	22.7
Density (Population per Km2)	1992	18.2
Vital Statistics		
Crude Birth (Rate per 1,000 Population)	1991	24.0
Infant Mortality (Rate per 1,000 Live Births)	1991	58.0
Crude Death (Rate per 1,000 Population)	1991	7.5
Life Expectancy at Birth (Years)	1991	66.0
Illiteracy (Percent)	1990	18.9
Primary School Enrollment Ratio	1990	108.0

Economic Statistics

Market Exchange Rate (Cruzeiros/US\$)	5-1993	37,040.3
GDP per Capita (Average Annual Growth Rate)	1983-1992	-0.1
Labor Force (Thousands)	1990	55,026
Unemployment Rate (Percent)	1992	5.9
Consumer Prices (Twelve Month Variation)	1992	1,000.0
NF Public Sector Operational Balance (% of GDP)	1991	-1.3
Domestic Credit (% of GDP)	1992	21.1
Balance of Payments (Millions of US\$)		
Current Account Balance	1992	6,300
Trade Balance	1992	15,700
Capital Account Balance	1992	8,800
Change in Reserves (- Increase)	1992	-15,100
Total External Debt (Millions of US\$)	1992	120,679
Total Debt Service (Millions of US\$)	1992	10,300
Debt to GDP Ratio (Percent)	1992	35.0
Debt Service Ratio (Percent)	1992	25.1

19 July 1993

BRAZIL
Basic Socio-Economic Data

1. Exchange Rates

**Cruzeiros/US\$, End of Period
Index 1980 = 100**

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Market Rate	0.0	0.0	0.0	0.0	0.1	0.8	11.4	177.1	1068.8	12387.5
Real Effective Index	130.1	134.6	138.6	147.8	147.7	136.9	109.8	93.5	116.5	129.8

2. Prices

Average Annual Growth Rates in Percent

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Consumer Price Index	142.0	196.7	226.9	145.3	229.7	682.3	1287.0	2938.0	440.8	1000.0
Wholesale Price Index	200.0	233.3	233.3	140.3	206.9	697.1	1284.1	2710.0	401.1	...

3. International Liquidity

Millions of US\$

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Reserves	4562	11996	11609	6761	7458	8116	8729	9176	8764	23268
Reserves minus Gold	4355	11508	10605	5803	6299	6972	7535	7441	8033	22521
Special Drawing Rights (SDRs)	0	1	1	0	0	0	...	11	13	1
Reserve Position in the IMF
Foreign Exchange	4355	11507	10604	5803	6299	6971	7535	7430	8020	22520
Gold (National Valuation)	207	488	1004	958	1159	1144	1194	1735	731	747

4. National Accounts

**Millions of 1988 US\$
1988 US\$**

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Gross Domestic Product	267318	281184	302978	326788	337755	337301	348050	332791	335283	331534
GDP Per Capita	2058	2118	2235	2362	2394	2346	2377	2233	2212	2151

Annual Growth Rates in Percent - Constant Prices

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
GDP Per Capita	-5.6	3.0	5.7	5.5	1.6	-2.0	1.4	-6.1	-0.8	-2.5
GDP by Type of Expenditure (MP)	-3.5	5.2	7.9	7.6	3.6	-0.1	3.3	-4.4	0.9	-0.9
Consumption	-2.9	2.2	2.8	12.5	1.7	-1.4	4.0	-1.9	2.0	-2.3
Gross Domestic Investment	-22.6	3.7	31.1	9.6	-1.3	-4.8	1.2	-8.1	-4.1	-0.7
Exports of Goods and Services	14.3	22.0	7.0	-10.6	19.2	13.1	5.1	-4.9	6.6	5.2
Imports of Goods and Services	-17.4	-2.9	0.0	28.7	-2.9	-1.1	8.9	10.1	10.1	-1.6
GDP by Sector of Origin (FC)										
Agriculture, Forestry and Fishing	-0.6	3.3	10.0	-8.0	15.0	0.8	2.9	-3.7	2.5	6.0
Mining and Quarrying	15.9	30.7	11.5	3.6	-0.9	0.4	3.9	2.9	0.3	-4.1
Manufacturing	-5.8	6.2	8.3	11.3	0.9	-3.4	2.9	-9.5	-0.5	-0.3
Electricity, Gas and Water	7.5	12.4	10.0	8.5	3.2	5.9	1.6	1.8	4.3	1.9
Construction	-13.9	0.8	6.0	18.5	1.0	-2.8	3.2	-8.4	-4.0	-4.4
Wholesale and Retail Trade	-3.9	3.9	7.4	7.8	2.6	-2.6	3.1	-6.4	1.4	-3.2
Transport and Communications	1.0	6.7	9.8	13.8	6.0	6.4	8.7	1.6	6.5	3.2
Financial Services	5.6	7.7	10.0	-1.8	-4.7	0.3	1.3	-3.1	-8.0	-4.6
Government	2.0	1.9	1.9	2.0	1.9	1.9	2.0	1.9	1.9	1.9
Other Services	-55.9	-27.4	-33.0	371.8	62.1	14.0	9.0	6.4	27.6	-9.5

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Basic Socio-Economic Data

4. National Accounts (cont.)

Composition in Percent - Current Prices

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
GDP by Type of Expenditure (MP)										
Consumption	80.4	77.7	75.7	78.5	74.5	72.1	72.0	76.8	79.1	...
Gross Domestic Investment	17.2	16.5	19.1	19.1	22.2	22.7	24.8	21.5	18.9	...
Exports of Goods and Services	11.7	14.2	12.2	8.8	9.4	10.9	8.2	7.2	8.5	...
Imports of Goods and Services	9.3	8.3	7.1	6.3	6.2	5.7	5.0	5.5	6.5	...
GDP by Sector of Origin (FC)										
Agriculture, Forestry and Fishing	11.9	12.9	11.8	11.5	10.3	10.5	8.9	10.4	10.8	...
Mining and Quarrying	1.9	3.0	3.2	2.7	2.2	1.9	1.6	1.6	1.7	...
Manufacturing	31.6	31.8	33.6	32.9	31.8	31.0	29.6	26.3	25.0	...
Electricity, Gas and Water	2.2	2.4	2.3	2.3	3.3	2.8	2.4	2.8	3.6	...
Construction	6.6	6.2	6.0	7.1	8.4	8.0	9.2	7.8	7.1	...
Wholesale and Retail Trade	10.1	9.4	9.1	8.7	8.0	8.1	7.8	7.3	7.1	...
Transport and Communications	5.8	5.6	5.3	5.1	5.2	5.4	5.5	5.5	5.5	...
Financial Services	9.9	10.2	9.3	10.0	10.6	11.4	11.7	14.2	15.8	...
Government	7.6	6.5	7.6	8.2	8.6	8.7	10.6	11.8	9.9	...
Other Services	12.2	11.9	11.7	11.7	11.5	12.2	12.8	12.2	13.6	...

5. Non-Financial Public Sector

As a Percent of GDP

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Borrowing Requirements	-21.7	-24.2	-28.5	-11.2	-32.2	-52.8	-82.7	-29.3	-25.8	...
Operational Balance (- Deficit)	-4.4	-2.7	-4.4	-3.6	-5.7	-4.8	-6.8	1.3	-1.3	...

6. Monetary Survey

As a Percent of GDP

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Domestic Credit	40.3	33.9	31.9	33.3	31.3	22.6	13.7	22.5	20.4	21.1
Public Sector	10.5	9.2	9.3	9.4	9.9	6.4	3.9	7.0	6.4	6.0
Private Sector	29.8	24.7	22.6	23.9	21.4	16.2	9.8	15.6	14.0	15.1
Money (M1)	5.1	3.5	3.2	9.1	4.1	2.1	1.2	3.7	2.7	1.4

7. External Trade

Direction in Percent Index 1980 = 100

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Exports of Goods (fob)										
Developed Countries	63.3	64.3	64.4	66.7	65.9	65.2	67.9	68.0	63.4	58.7
Developing Countries	36.7	35.7	35.6	33.3	34.1	34.8	32.1	32.0	36.6	41.3
Latin America	10.3	11.3	9.6	12.3	12.3	11.9	11.8	11.3	16.5	22.2
Imports of Goods (cif)										
Developed Countries	38.4	39.8	45.3	59.2	56.0	57.5	55.8	54.9	59.3	60.2
Developing Countries	61.6	60.2	54.7	40.8	44.0	42.5	44.2	45.1	40.7	39.8
Latin America	14.4	15.6	12.3	13.1	12.1	12.8	18.3	17.1	18.0	16.5
Terms of Trade Index	77.9	85.8	83.5	97.9	87.1	96.8	88.9	83.8	91.7	90.0

BRAZIL

Basic Socio-Economic Data

7. External Trade (cont.)

	Composition in Percent									
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Exports of Goods (fob)										
All Food	40.9	39.2	37.2	34.7	32.5	29.6	27.5	28.0	25.0	...
Agricultural Raw Materials	4.1	3.1	2.6	2.8	3.6	3.4	3.5	3.5	3.5	...
Fuels	5.4	6.8	6.4	3.2	3.6	2.7	2.5	2.2	1.5	...
Ores and Metals	17.4	17.2	18.1	19.8	17.9	23.3	25.1	25.3	27.7	...
Manufactured Goods	32.3	33.7	35.7	39.5	42.3	41.0	41.4	41.0	42.3	...
Chemicals	5.8	6.4	6.6	5.7	6.2	6.5	6.0	6.4	6.4	...
Machinery and Transport Equipment	14.0	12.6	15.4	17.4	20.5	19.0	20.1	18.7	18.8	...
Other Manufactured Goods	12.5	14.6	13.7	16.4	15.7	15.5	15.3	15.9	17.1	...
Imports of Goods (cif)										
Capital Goods	12.2	9.6	11.2	13.9	16.0	17.6	15.6	17.6
Consumption Goods	4.1	3.0	4.2	11.8	6.7	5.1	10.4	11.4
Intermediate Goods	83.4	87.2	84.3	74.0	77.3	77.2	73.9	70.7
Fuels
Other	0.4	0.3	0.3	0.2	0.1	...	0.1	0.3

8. Balance of Payments

	Millions of US\$									
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Current Account Balance	-6837	42	-273	-5304	-1450	4159	1025	-3788	-1408	6300
Trade Balance	6469	13086	12466	8304	11158	19168	16112	10747	10578	15700
Exports of Goods (fob)	21898	27002	25634	22348	26210	33773	34375	31408	31619	36200
Imports of Goods (fob)	15429	13916	13168	14044	15052	14605	18263	20661	21041	20500
Service Balance	-13414	-13215	-12894	-13695	-12678	-15103	-15331	-15369	-13542	-11400
Freight and Insurance	403	453	514	34	152	235	143	-50	-156	-250
Travel	-392	-153	-375	-509	-184	-588	474	-122	-212	-50
Investment Income	-11008	-11470	-11192	-11127	-10319	-12084	-12547	-11613	-9652	-9135
Other Services	-1109	-832	-972	-1219	-1357	-1369	-1766	-1944	-1965	-1965
Unrequited Transfers	108	171	155	87	70	94	244	834	1556	2000
Private	106	161	139	89	113	107	226	813
Official	2	10	16	-2	-43	-13	18	21
Capital Account Balance	5532	4928	292	2006	4417	-1621	1495	5330	753	8800
Non-Monetary Sector	7760	5331	3528	4960	6194	493	4201	8317	3724	11700
Private Sector	-126	-4010	-2393	-4233	-6840	-6482	-3887	1047	3598	12600
Direct Investment	1373	1556	1267	177	1087	2794	744	236	-42	...
Portfolio Investment	-286	-272	-237	-450	-428	-498	-421	575	3808	...
Other Long-Term	-848	-1391	-2421	-4135	-7471	-7272	-3670	-232	-1077	...
Other Short-Term	-365	-3903	-1002	175	-28	-1506	-540	468	909	...
Government Sector	7886	9341	5921	9193	13034	6975	8088	7270	126	-900
Long-Term	9274	11283	6325	8818	7995	7947	2737	-3584	-3416	...
Short-Term	-1388	-1942	-404	375	5039	-972	5351	10854	3542	...
Monetary Sector	-2228	-403	-3236	-2954	-1777	-2114	-2706	-2987	-2971	-2900
Long-Term	-1519	-1404	-2643	-3647	-2178	-2520	-2415	-1354
Short-Term	-709	1001	-593	693	401	406	-291	-1633	-2355	...
Change in Reserves (- Increase)	1891	-5369	511	3232	-2165	-1711	-1701	-1246	-221	-15100
Errors and Omissions	-586	399	-530	66	-802	-827	-819	-296	876	...

BRAZIL
Basic Socio-Economic Data

9. External Debt

	Millions of US\$ Ratios in Percent									
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Debt	98367	105424	106147	113735	123864	115726	111378	116417	116514	120679
Long-Term Debt	81368	90113	91915	99550	106227	101477	90375	90431	95129	97898
Public and Publicly Guaranteed	59856	70809	74738	84909	91793	89963	84368	83760	87476	90070
Bilateral	5021	6859	8176	10542	12867	13028	13354	15469	14779	14761
Multilateral	5122	5622	7358	10027	12311	11413	11088	11386	11068	10343
Bond Holders	2231	1698	1816	1787	1516	1546	2183	2339	9150	11330
Banks	41199	50750	50107	54000	55839	55833	49949	46185	44041	45201
Suppliers	2636	2590	3117	3614	3684	3028	2605	2585	2745	2699
Other Creditors	3647	3290	4164	4939	5576	5115	5189	5796	5693	5736
Private Non-Guaranteed	21512	19304	17177	14641	14434	11514	6007	6671	7653	7828
Use of IMF Credit	2644	4185	4619	4501	3976	3333	2422	1821	1238	1045
Short-Term Debt	14355	11126	9613	9684	13661	10916	18581	24165	20147	21736
Interest Arrears on Debt	151	178	344	398	3431	593	3755	9240	4352	5673
Total Debt Service	13416	13989	11309	11809	12043	17740	13425	8041	10754	10300
Public and Publicly Guaranteed	7528	8026	7042	7568	7889	13059	8752	5577	7603	7306
Bilateral	769	919	684	1122	955	591	1321	1079	1532	1910
Multilateral	708	890	1084	1522	1980	2132	1911	2494	2451	2577
Private Non-Guaranteed	4224	4137	2427	2172	1860	2225	2504	1468	1090	1436
IMF Repurchases and Charges	68	204	402	978	1455	1179	1069	996	717	493
Short-Term Debt (Interest only)	1596	1622	1438	1091	839	1277	1100	0	1344	1065
Debt to GDP Ratio	43	43	37	36	36	34	31	37	34	35
Debt Service Ratio	55	46	39	47	42	48	35	22	30	25

... Not Available

0.0 Indicates that the amount is nil or negligible

BRAZIL
Basic Socio-Economic Data

Sources and Notes

Executive Summary

Social Statistics:

Land Area: Organization of American States (OAS), América en Cifras 1974.

Population: IDB estimates based on data from Latin America Demographic Center (CELADE) and United Nations Population Division.

Vital Statistics:

World Bank, Social Indicators of Development - 1993 Edition and Economic Commission for Latin America and the Caribbean (ECLAC), Statistical Yearbook - 1992 Edition.

Economic Statistics:

Labor Force: World Bank, Social Indicators of Development - 1993 Edition.

Unemployment: Programa Regional del Empleo para América Latina y El Caribe (PREALC).

1. Exchange Rates:

International Monetary Fund (IMF), International Financial Statistics (IFS).

Real Effective Index: IDB estimates based on data from the IMF.

2. Prices:

IMF, IFS. Annual figures are expressed as average annual growth rates; monthly figures as a twelve month variation.

3. International Liquidity:

IMF, IFS.

4. National Accounts:

GDP in 1988 US Dollars: IDB estimates.

GDP by Type of Expenditure and Sector of Origin: Fundação Instituto Brasileiro de Geografia e Estatística, Departamento de Contas Nacionais. Consumption includes changes in inventories from 1985.

5. Non-Financial Public Sector:

Banco Central do Brasil, Departamento Econômico. Operational Balance excludes monetary and exchange correction on the domestic debt.

6. Monetary Survey:

Domestic Credit: Banco Central do Brasil, Relatório Anual, various issues (geometric mean of year-end stocks).

Money Supply: Ibidem (mid-year observations).

7. External Trade:

Trade by Direction: IMF, Direction of Trade Statistics (magnetic tapes).

Terms of Trade: ECLAC, Balance Preliminar de la Economía de América Latina y el Caribe, 1992.

Export Composition: United Nations Statistical Division (UNSTAT) Commodity Trade (COMTRADE) Data Base; Exports include Re-Exports.

Import Composition: ECLAC. Fuels and Lubricants and Passenger Automobiles are included in Other.

8. Balance of Payments:

Banco Central do Brasil and IMF, Balance of Payments Statistics (magnetic tapes).

9. External Debt:

World Bank, World Debt Tables (magnetic tapes).

BRAZIL
OPERATIONS DEPARTMENT
OPS/IRO

IDB LOANS

APPROVED AS OF JUNE 30, 1993

	US\$Thousand	Percentage
TOTAL APPROVED *	8,858,689	100.0%
DISBURSED	6,888,015	77.8%
CANCELLATIONS	1,144,593	12.9%
UNDISBURSED BALANCE	1,970,674	22.2%
PRINCIPAL COLLECTED	3,548,951	40.1%
APPROVED BY FUND		
ORDINARY CAPITAL	7,253,992	81.9%
FUND FOR SPECIAL OPERATIONS	1,473,176	16.6%
SOCIAL PROGRESS TRUST FUND	61,510	0.7%
VENEZUELAN TRUST FUND	51,721	0.6%
OTHER FUNDS	18,290	0.2%
APPROVED BY SECTOR		
AGRICULTURE AND FISHERY	960,232	10.8%
INDUSTRY AND MINING	1,551,333	17.5%
TOURISM AND MICROENTERPRISE	0	0.0%
ENERGY	1,919,908	21.7%
TRANSPORTATION AND COMMUNICATIONS	1,640,695	18.5%
EDUCATION SCIENCE AND TECHNOLOGY	509,473	5.8%
PUBLIC AND ENVIRONMENTAL HEALTH	1,442,727	16.3%
URBAN DEVELOPMENT	491,741	5.6%
PLANNING AND REFORM	0	0.0%
EXPORT FINANCING	266,477	3.0%
PREINVESTMENT AND OTHER	76,103	0.9%

* Net of cancellations with monetary adjustments and export financing loan collections.

B R A Z I L

Tentative Program 1993-1994

1 9 9 3			
Number	Sector	Name	Amount in US\$ millions
BR-0072	OS	Clean-up of Guanabara Bay	405
BR-0073	OS	Clean-up of Gualaiba Bay	116
BR-0162	TR	Modernization Highway Fernão Dias	267
BR-0196	TR	Transportation Bahia	147
BR-0194	VR	Sectoral Debt Reduction	400
Subtotal			1.335
1 9 9 4			
BR-0192	OS	Sanitation Igarapés Manaus	98
BR-0204	TU	Development of Potential for Tourism in the Northeast	200
BR-0203	OS	Sanitation Bahia Todos os Santos	216
BR-0159	OS	Drainage São Paulo II	319
BR-0150	TR	São Paulo-Florianópolis Highway	200
BR-0166	VR	Strengthening Integration Mechanisms	10
BR-0163	TR	Urban Transportation São Paulo-Metro	400
BR-0164	CYT	Science and Technology FINEP II	160
Subtotal			1.603
TOTAL			2.938

**PROGRAM TO MODERNIZE AND WIDEN THE FERNÃO DIAS FEDERAL HIGHWAY
Stage One**

(BR-0162)

EXECUTIVE SUMMARY

BORROWER AND GUARANTOR: Federative Republic of Brazil

EXECUTING AGENCY: Departamento Nacional de Estradas de Rodagem [National Highway Department] (DNER), and as co-executing agencies: the Minas Gerais State Highway Department (DER/MG) and the São Paulo State Highway Department (DER/SP).

AMOUNT AND SOURCE:

IDB:	US\$267 million (OC)
Local counterpart funding:	US\$267 million
Total:	US\$534 million

TERMS AND CONDITIONS:

Amortization period:	20 years
Disbursement period:	4 years
Interest rate:	variable
Inspection and supervision:	1%
Credit fee:	0.75%

OBJECTIVES: The objectives of the project are: (i) to efficiently meet the demand for highway transportation between the metropolitan regions of Belo Horizonte and São Paulo; (ii) to offer a supplementary alternative route along the north-south longitudinal corridor along the country's Atlantic coast; (iii) to improve safety conditions for users; (iv) to contribute to the development of economic activities in the highway's service area; and (v) to establish the frame of reference and activities necessary to introduce a system of investment recovery.

DESCRIPTION: The project includes the first stage of works proposed, over a length of approximately 269 km, consisting of roughly 217 km in the state of Minas Gerais and 52 km in the state of São Paulo. The main works to be undertaken as part of the project include: (i) recovery and improvement of approximately 269 km of existing highway, which would constitute one of the roadways for the improved highway; (ii) construction within the current right of way of approximately 269 km of roadway parallel to the existing one, with similar technical

characteristics; (iii) expansion of existing bridges and drainage facilities, as necessary; (iv) construction of two parallel tunnels in the section located in the Cantareira mountain range near São Paulo; (v) construction, improvement and widening of access ramps and urban through roads; (vi) placement of highway safety devices, traffic signs and additional landscaping and environmental-protection works; (vii) construction and installation of three toll stations; six highway police control stations and an additional station for weighing and measuring cargo vehicles.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environmental Management Committee, at its meeting on January 25, 1993, classified this project as a Category III operation and at its meeting on May 18, 1993, approved the corresponding environmental summary.

BENEFITS:

The main benefits of project execution will be as follows: (i) reduction of transport costs and highway travel times; (ii) significant improvement in safety conditions, with a resulting decrease in the number of accidents; (iii) establishment of a cost recovery system through toll collection; (iv) reduction in environmental pollution as a result of reduced fuel consumption; and (v) expansion and development of certain economic activities in the road surface area.

RISKS:

Costs will be recovered by means of tolls which are permitted by law and do not represent a tax. Thus, while there is political support for introducing such a mechanism, the risk is that it may disappear due to unforeseen circumstances, affecting the ability to derive revenues as proposed. In order to minimize this risk, it has been proposed that provisions be included in the loan contract under consideration requiring continued toll collection on sections covered by the proposed project.

Local counterpart funding for the project consists of budgetary allocations from the national treasury and from the states of Minas Gerais and São Paulo. The local counterpart funding is viable both politically and financially, but there is the risk that new federal or state administrations might establish different priorities affecting the timeliness and levels of funding. This risk is relatively slight given the high priority now assigned to the project and the fact that the works will be contracted within the first year of execution.

Execution of a first stage of the project is no guarantee that subsequent stages would be executed. The first stage of the project is technically and economically feasible and this feasibility does not depend on execution of the second stage. However, the overall benefits would be reduced if all of the widening and modernization works planned are not fully executed. This risk is limited given the decision of the Federal government, the states of São Paulo and Minas Gerais and of the DNER to execute the subsequent stage as soon as possible.

**THE BANK'S
COUNTRY STRATEGY:**

In order to optimize the impact of the Bank on the transportation sector of Brazil, an identification mission was sent in November 1991 that identified, in cooperation with the Secretariat for International Affairs (SEAIN), the criteria for selecting projects in the sector to be considered by the Bank. The main transportation corridors were defined, allowing the federal and state projects to be prioritized, maintaining a functional and operational overview of the system. The proposed project meet the selection criteria indicated, which favor recovery and improvement of the existing network within the context of the National Transportation System (SNV). As a result of the recent Bank programming mission, conducted in June 1993, the Federal government has ratified the high priority assigned to the project and its interest in obtaining the financing requested during the current year.

**COORDINATION OF
LOCAL EFFORTS AND
RESOURCES:**

Participation in the local counterpart funding for the project, by the union of the States of Minas Gerais and São Paulo, and the coordination of execution between the DNER, DER/MG and DER/SP, represent new approaches to the execution of highway projects within the Brazilian federal system. Such coordinated effort will help to optimize the conditions under which the proposed modernization and expansion project are carried out for all parties concerned.

I. FRAME OF REFERENCE

A. General context

- 1.1 The industrial, agricultural and service sectors within the triangle formed by the states of São Paulo, Minas Gerais and Rio de Janeiro represent an important part of Brazilian economy. Together with the state of Espírito Santo they constitute the southeast region of Brazil, where the country's major production and consumer markets are concentrated. The states of São Paulo and Minas Gerais constitute the two largest economies of the country.
- 1.2 The state of São Paulo covers an area of 247,898 km², representing 2.9% of the country's land area. Politically it is divided into 572 municipalities grouped into 63 homogenous microregions and 15 mesoregions. The current population of the state is approximately 31.2 million, which represents 21.3% of the population of Brazil. The city of São Paulo, the state capital, constitutes the largest industrial center in South America, and its metropolitan area has a population of 16.3 million.
- 1.3 The state of Minas Gerais covers an area of 587,172 km², which accounts for 6.9% of the country's total area. Politically, it is divided into 756 municipalities, 66 homogenous microregions and 12 mesoregions. The current population is approximately 15.8 million, accounting for 10.8% of the country's total population. The city of Belo Horizonte, the state capital, has a population of 3.5 million within its metropolitan area.

B. The service area of the project

- 1.4 In general terms, the highway service area is practically urbanized, with dense population at either end of the highway, where the metropolitan and industrial regions of São Paulo, with approximately 16.3 inhabitants, and Belo Horizonte, with approximately 3.5 inhabitants, are located. There are 18 intermediate and small urban sites along the highway between the two large cities (see map 1). The highway service area reaches 34 municipalities; 28 are located in the state of Minas Gerais and six are located in the state of São Paulo, with an approximate population of 850,000 inhabitants, with 83.5% residing in urban areas.
- 1.5 The principal characteristics of land use in the highway service area have changed little since the days before the highway was built. In rural areas, livestock is raised, and grains, coffee and vegetables are grown. At the urban level, the two principal cities of the metropolitan regions, followed by the Varginha, Pouso Alegre, Três Corações and Lavras, in the state of Minas Gerais and Bragança Paulista in the state of São Paulo, perform the most

important functions of commerce and services to the population, as well as in system of production and consumption.

- 1.6 Agricultural activities are highly mechanized and production levels are high. Coffee is the most important crop and has the longest history. Coffee cultivation is concentrated in the south of Minas Gerais in the municipality of Varginha. There is intense cultivation of garlic and potatoes in this region. The Bragantina region has significant strawberry production, which is marketed through cooperatives. With respect to livestock, 90% of the cattle are dairy cattle, producing milk which is processed primarily for consumption in the two large metropolitan areas.

C. National highway policy

- 1.7 National highway policy as established by the Ministry of Transportation for the period 1992-2001, is based on the following objectives:
- a. to restore and maintain the existing highway system, improving its operational level;
 - b. to establish a permanent system of financing to recover federal highway maintenance costs;
 - c. to encourage private investment in the development and operation of highway infrastructure;
 - d. to encourage participation by private initiative in the execution of management systems in the operation of the federal highway system; and
 - e. to redefine the highway system under federal jurisdiction, on the basis of structured corridors, with emphasis on interconnections with neighboring countries, leaving other areas to the states.
- 1.8 In accordance with the policy outlined, the DNER has prepared a Plurianual Plan (1993-1995) and a target plan (1992-2001) for the federal highway system. The former sets physical and financial goals for the short term, approved by the congress of the union in 1992, and the latter sets long-term goals. According to the planning documents mentioned earlier, 900 km of paved highway will be constructed in 1993 and beginning in 1994, approximately 700 km/year, at an average cost of US\$500/km. The planned restoration works include: 7,300 km in 1993; 5,000 km during the period 1994-1995; 3,000 km in 1996; and 3,000 in 1997, at an average cost of US\$100,000/km.
- 1.9 The estimated average annual cost of routine highway maintenance is estimated at US\$2,500/km. Maintenance activities will be conducted on 59,500 km in 1993, 61,000 km in 1994, 60,000 km in 1995 and

56,000 km in 1996-1997. Within the frame of reference given by both plans, it is understood that restoration of the highway system is designed to prolong the useful life of the highways, but at a cost lower than that for restoration. Basically, the work consist of resurfacing at an average cost of US\$30,000/km. It was estimated that those needs will continued to be covered on the basis of approximately 3,000 km/year beginning in 1994.

- 1.10 Other investments relate to highway safety, weighing stations and equipment, works necessary to eliminate critical points and other miscellaneous works. For the year 1993, due to budgetary restrictions, an investment equivalent to US\$90 million was estimated. The amount of US\$150 million is considered to be more consistent with these requirements and has been budgeted annually starting from the year 1994.
- 1.11 Among the highway policy objectives mentioned above, those concerning the participation of private initiative are especially important, and are being met through the formulation of plans for the concession of highway works and services to private enterprise. The DNER has conducted a preliminary study indicating the viability of privatizing the operation of 13 sections of federal highway with a total length of 7,740 km, which include the Fernão Dias highway (BR-381) between Belo Horizonte and São Paulo, the highway covered by this project.
- 1.12 In accordance with the DNER plans for implementing the policy on concession on highway works and service concessions, invitations to tender are now being issued for the bridge connecting the cities of Rio de Janeiro and Niterói and the section of highway BR-116 between São Paulo and Rio de Janeiro, which is 410 km in length. It is anticipated that contracting will be concluded during the current year.
- 1.13 The objectives concerning the use of private services for operation of federal highway are being fulfilled in a first stage by contracting the maintenance operations with private companies. It is anticipated that once the weighing stations in the federal highway systems have been reactivated (see paragraphs 1.25 and 1.26), their operations will also be privatized. Even though the law on concessions now under consideration in the Federal Senate has not yet been approved, current legislation permits the concession of highway construction and operation (Article 175 of the Constitution and Article 70 of law 191 of August 27, 1969, Decree 94002). Approval of the law on concessions would give better legal coverage to the field, since it is more extensive and detailed than current legislation.

D. The federal highway system

- 1.14 As currently planned, the federal highway system will consist of 89,060 km of highways, of which 66,561 km (74.8%) already exist and 22,499 km (25.2%) remain to be built. Of the 66,561 km in service, 50,162 km, i.e. 75.4%, are paved and 16,399 km are unpaved.
- 1.15 In accordance with the guidelines issued by the Ministry of Transportation for the development of highway transportation, DNER has modified the current system as follows:

Type of highway	Current system (km)	New system (km)	Difference (km)
Paved	50,162	45,059	5,103
Unpaved	16,399	15,439	960
Planned	22,499	8,586	13,913
Total	89,060	69,084	19,976

- 1.16 The system to remain under the responsibility of the DNER will consist basically of federal highways serving as main trunk roads. This system represents 3% of the total length of national highway system. In terms of service, however, it accounts for 43% of highway transportation. Consequently, the maintenance and operation of 6,063 km of existing highways will be transferred to the states concerned, as will responsibility for the construction of 13,613 km of planned highways.
- 1.17 The new federal highway system will be defined by specific law sanctioned to be adopted by the national congress in 1993.

E. Fernão Dias highway (BR-381)

- 1.18 Federal highway BR-381, which originates in the city of São Paulo, enters the state of Minas Gerais from the south, runs through Belo Horizonte, and continues northeastwards until it intersects with federal highway BR-116 in the municipality of Governador de Valadares, ending in the city of São Mateus in the state of Espírito Santo. Its total length is 1,117 km, of which 845 km are paved, between São Paulo and the junction with highway BR-116 (Governador Valadares). The section between São Paulo and Belo Horizonte has been named Fernão Dias in honor of the explorer who took roughly the same route through these states. It was built and paved during the 1950's and opened in 1961. Since its construction, this highway's importance has grown by completing the so-called Brazilian economic triangle, whose other two sides are formed by the highways Presidente Dutra (BR-116), between Rio de

Janeiro and São Paulo, and Juscelino Kubitschek (BR-040), between Belo Horizonte and Rio de Janeiro.

- 1.19 Through São Paulo, this highway provides access to the entire southern portion of the country and by way of Belo Horizonte connects the central southern region with Brasília from which point other highways radiate out towards the various regions of the country. Aside from its economic, social and cultural importance, the strategic character of this highway for national development is particularly noteworthy, since it constitutes one of the means of interconnection between the northeast and southern region of the country.
- 1.20 Over the 30 years the highway has been in service, traffic has gradually increased, particularly in the vicinity of major cities. As early as 1970, traffic demand led to the construction of a second roadway between Belo Horizonte and Betim and since then, widening projects were developed for the other sections, even though the works could never be executed for lack of financial resources. In 1983, given a situation that was worsening every year, a number of improvements were made which basically consisted of the conversion of highway shoulders into an extra uphill lane, which improved traffic flow along the steepest sections but worsened safety conditions.
- 1.21 Consequently, the project to widen and modernize the Fernão Dias Highway (BR-381) is designed to create appropriate technical conditions for current and future transportation needs, in accordance with quality and safety standards so as to reduce the large number of accidents which, in 1990 totaled 2,161, involving 3,250 vehicles and more than 2,300 victims (injuries and fatalities combined).

F. Maintenance of the federal highway system

- 1.22 Maintenance of the highways in the federal highway system is the responsibility of the DNER, a body which operates through 21 regional federal districts located in 21 different states. These districts have a total of 110 residencies. Specifically, the maintenance operations for the highway system are carried out by the districts by means of contracts awarded to private companies or agreements delegating these operations to the highway departments of the various states.
- 1.23 In the specific case of the Fernão Dias highway (BR-381) the regional federal district offices of Minas Gerais and São Paulo, located in Oliveira, Pouso Alegre and Guarulhos are responsible for maintenance. In both cases maintenance operations per se are performed by contractors. During the analysis mission, the project team observed that the current maintenance condition of the highway is satisfactory with the exception of a section of approximately 140 km between Oliveira and Varginha, which requires resurfacing.

On the remaining 423 km the road surface is in reasonably good condition but capacity and safety conditions are clearly deficient in some aspects.

- 1.24 The DNER has a road surface supervision and management program which can serve as an effective instrument for maintaining highways under its jurisdiction. The main objectives of this program are: (i) preparation of an annual detailed maintenance program, identifying maintenance requirements for priority highway sections and their related cost; (ii) establishment of a data base to analyze maintenance strategies; and (iii) adoption of methodologies for periodic monitoring of the travelability and maintenance of the highway system, updating of the data base and gradual improvement of the DNER's management system. Execution of the maintenance programs is monitored by the engineering division.

G. Weight control

- 1.25 Between 1975 and 1980, the DNER introduced a program for weighing heavy transport vehicles circulating on federal highways, building stations and other facilities and procuring the necessary equipment: dynamic-action electronic scales allowing trucks to be weighed while moving at reduced, controlled speed. Over the years, program operations began to break down, primarily as a result of damage caused to the sophisticated equipment by sudden, often intentional braking when trucks passed over the platforms. Another reason was the lack of skilled personnel and inadequate equipment maintenance.
- 1.26 The DNER's plan of action includes the reactivation of 430 control stations during the period 1992-2001. The operation of these stations will be contracted out to private companies which would also train the necessary personnel.

H. Cost recovery

- 1.27 Based on careful study, it has been concluded that the current legal framework allows for the introduction of cost recovery mechanisms, such as tolls, and the participation of private companies in highway operation. Article 150 of the Brazilian constitution permits the union, the states, the federal district and the municipalities to establish tolls. Decree Law No. 791 of August 27, 1969 provides that the tolls may be collected to recover the cost of investment in and operation, administration and maintenance of service facilities - in this case, highways and bridges.
- 1.28 The bill on concessions under consideration in the Senate will expressly permit tolls to be established in the bid proposals for concessions, including the country's highways concessions, without limitations based on rates of profitability or other criteria. Without prejudice to the progress that approval of the

aforementioned law would represent with regard to tolls, the current rules allow for the introduction of cost recovery systems on the most heavily travelled and technically advanced highways.

- 1.29 This year, the DNER intends to reintroduce tolls on the Rio de Janeiro - Niterói bridge and on the Rio de Janeiro - São Paulo highway (BR-101). Also under study is the introduction of tolls on all paved divided highways in the federal system, which would include the Fernão Dias highway once the proposed widening and modernization works have been completed. This would entail the construction of three toll stations. The contractual conditions for such toll collection are proposed in Chapter III of this document.

I. Importance of the project in terms of the national highway strategy

- 1.30 The widening and modernization of the Fernão Dias federal highway is a project entailing infrastructural development of great importance to Brazil's economy and integration of the country's northeastern, midwestern, southeastern and southern regions. Agricultural production - primarily cereals and food crops for the domestic and export markets - is concentrated in the midwestern, southeastern and southern regions of Brazil. Highway infrastructure is required to encourage industrial decentralization, i.e. moving certain industries from current industrial centers to the area served by the Fernão Dias highway and to the agricultural regions mentioned above. The São Paulo - Belo Horizonte corridor, in the region south of Minas Gerais, has been selected as a new area for industrial development to relieve saturation in São Paulo.
- 1.31 The Fernão Dias federal highway also provides an alternative and supplementary route for such major highway corridors as federal highways BR-101 and BR-116, which traverse the country from north to south, the first along the Atlantic coast the second running through the states with the greatest economic activity. These highways and others in the federal system, such as BR-050 in the state of São Paulo, which provide access to Porto de Santos, highway BR-040 from Belo Horizonte to Rio de Janeiro and highway BR-262 to Porto de Vitória, have been gradually improved along critical sections since the 1960s. The project to widen and modernize the Fernão Dias federal highway will thus help to improve conditions on the country's other main highway corridors.
- 1.32 The current technical characteristics of the highway, the congested conditions, the increasing number of accidents and the composition of traffic along this route are the factors that resulted in high priority being assigned to execution of the project. Current conditions are particularly problematic for heavy trucks (multi-axle, trailer). As for traffic composition, automobiles account for 28%, omnibuses for 17% and trucks 55%.

- 1.33 Highway demand is greatest between São Paulo and Belo Horizonte, since there is no direct railway between them. The only rail connection between these two cities is by way of a long rail line stretching into the state of Rio de Janeiro and passing through Barra do Piraí, Itatinga, Jeceaba and Belo Horizonte. The capacity and frequency of trains is insufficient for cargo transport, and passenger transportation between the terminal points is restricted.

J. Rationality of the project, strategies of the country and the Bank

- 1.34 In order to optimize the impact of Bank financing on the transportation sector of Brazil an identification mission was sent in November 1991. In cooperation with the Ministry for International Affairs (SEAIN), this mission helped to define the criteria for selecting transportation projects for possible Bank financing. The concept of principal transportation corridors was defined for use in prioritizing federal and state projects in the country, according to a functional and operational overview of the system. The Fernão Dias project meets these selection criteria which are consistent with the aim of rehabilitating and adapting the existing system under the Sistema Nacional de Viacão [National Transportation System] (SNV), and has been assigned high priority by the federal government and the states of Minas Gerais and São Paulo. Both states and the federal government will participate in the financing.
- 1.35 The conceptualization and design of the project are consistent with the government's policy objectives in this sector, particularly with regard to the reduction of transportation costs, and the improvement of highway safety and maintenance efficiency. The federal government and the Bank agreed that financing for the transportation sector will be allocated on a priority basis to the improvement of corridors that are most important for the economies of the country and/or the states. The project proposed is consistent with national priorities and with agreements between the Bank and the federal government, as reflected in the programming mission in May 1992, whose report was approved by the programming committee at its meeting on June 24, 1992, incorporating this project in the Bank's operating program for Brazil and was ratified by the last programming mission in June 1993.

K. The Bank's experience in financing federal highways

- 1.36 The Bank has financed seven projects to improve and/or build federal highways, with total lending of US\$296.5 million. The DNER has been the executing agency in all of these operations.

1.37 The projects financed are as follows:

1. Loan 80/SF. Improvement of Paranaguá-Foz do Iguacu highway

1.38 Financing was approved of December 1965 in the amount of US\$20 million intended for the improvement of this highway. The final cost was US\$62 million, in accordance with the original estimate. The established objectives were accomplished, the works were executed in accordance with the specifications and technical standards and the special contractual causes were adhered to.

2. Loan 191/SF. Project to improve and build highways in the northeast

1.39 Loan approved in September 1968 in the amount of US\$35 million. The project included the widening, construction and improvement of 785 km of various federal highway sections in the northeast region of the country (BR-101; BR-116 and BR-232), including the construction of a bridge over the river São Francisco. The period of execution of the project was expanded to two years, given the delay in construction of the bridge, and was completed in March 1974. The physical goals set for the project and the contractual conditions were met. The initial cost increased by 12.6% due to variations in prices and the exchange rate, as well as extension of the execution period. The final cost amounted to US\$87 million, the difference being covered by resources from the local counterpart funding. The DNER supervised the works in a satisfactory manner.

3. Loans 216/OC and 301/SF. Brazil-Uruguay integration highways

1.40 The financing was approved in July 1971. The project consisted of the construction, improvement and paving of four federal road sections (BR-116; BR-153; BR-158; and BR-392), located in the state of Rio Grande de Sul, with a total accumulated length of 635.6 km. The execution period for the project had to be extended by one year and five months due to delays in the preparation of studies and designs. The physical goals of the project were accomplished. The total cost of the project increased by 60% due to an increase in the price of fuel, and modified specifications concerning the type of pavement to be used. The original cost was US\$83 million with the Bank contributing US\$47 million. The final cost was US\$132 million, the difference being covered with local resources. The works were supervised in a satisfactory manner by the DNER. No failure to fulfill contractual conditions was noted.

4. Loan 234/OC. Construction of the Rio de Janeiro-Santos highway (stage I)

1.41 This loan was approved in September 1972. The project entailed the construction of 257.1 km for the first section of the highway between the cities of Santa Cruz, in the state of Rio de Janeiro

and Ubatuba, in the state of São Paulo. The physical goals of the project were fully met. The execution period of the project had to be extended by 18 months because of restrictions in the flow of local resources. The total cost of the project increased by 46% as a result of cost increases for oil, materials and labor. The original cost of US\$135 million rose to US\$197.2 million. The Bank's contribution was US\$40 million. The quality standards were fully satisfied. The DNER supervised the works of the program in a satisfactory manner. The DNER could not demonstrate fulfillment of the clause concerning the installation of weigh scales because of technical difficulties and resource problems (see paragraph 1.25). The other special conditions were fulfilled.

5. Loan 262/OC. Construction of the Rio de Janeiro-Santos highway (stage II)

- 1.42 Financing approved in November 1973 for the construction of stage II of the highway between Rio de Janeiro and Santos (Ubatuba-Cubatão section), 124 km in length. Of the US\$36 million in Bank financing, US\$22 million were canceled because of a change in priorities at the federal level and the unavailability of local counterpart resources. Forty-five percent of the goals originally established were completed, and the execution period had to be extended by four months. The total cost of the original project was estimated at US\$102 million. In general terms, the quality of work performed by the construction companies participating in project execution was good. Supervision of the works conducted by the DNER with the assistance of consulting firms was satisfactory, but the objectives established under the Bank financing were not fulfilled. Subsequently, the DNER improved the uncompleted section, but with technical characteristics inferior to those set forth in the original project.

6. Loan 269/OC. São Paulo-Curitiba highway

- 1.43 The loan was approved in June 1974 for widening and modernization of a 400 km section of highway BR-116. This project involved the construction of two new roadways 137 km in length; the construction of a third 60 km uphill lane; construction of bridges and the resurfacing of critical sections. The physical goals were only partially attained, as a result of technical modifications and cost increases for the construction works, but the works substantially improved highway service reducing travel time and costs. The main factor in the delay was the DNER's decision to modify the original project, building a double roadway along the entire length of the project, which could not be executed. The period for execution of the project had to be extended for two years due to these technical changes and the unavailability of local resources. The total cost of the project increased by 76% as a result of delays and price variations in the construction market. The original cost was US\$211 million with the Bank contributing US\$60 million. The final cost amounted to US\$371 million, the difference being covered with

local counterpart funding. The DNER, with the assistance of a consulting firm, supervised execution of the works in a satisfactory manner. Fulfillment of the contractual clauses was reasonable with the exception of certain irregularities in highway maintenance.

7. Loans 150/IC and 503/OC. Widening and paving of highway BR-634. Porto Velho-Rio Branco

- 1.44 Financing in the amount of US\$58.5 million was allocated to widen and pave 502 km of highway and to formulate and implement a Plan for the Environment and Indigenous Communities (PMACI) to mitigate the direct and indirect impact of the highway component on the environment. The total cost, initially US\$146.7 million, rose to US\$167.3 million, (14%), primarily because the period for disbursement was extended and the disbursements were suspended for more than one year, paralyzing the project because of failure to comply with the activities set forth in the PMACI. The highway has been opened to traffic, although components of the PMACI still must be completed, with final completion scheduled for September 1994. The works have been carried out in accordance with the quality standards adopted. Once these difficulties were overcome, the executing agencies, the DNER and the Ministry of the Environment, have fulfilled their obligations under the loan contract, although the PMACI still must be completed.

II. THE PROJECT 2/

A. Objectives

- 2.1 The main objectives of the project are as follows: (i) to efficiently meet the demand for highway transportation between the Metropolitan regions of Belo Horizonte and São Paulo; (ii) to offer a supplementary alternative route along the north-south longitudinal corridor along the country's Atlantic coast; (iii) to improve safety conditions for users of the Fernão Dias highway; (iv) to contribute to development economic activities in the highway's service areas; and (v) to establish the frame of reference and actions needed to recover the investment.

B. Description of the project

- 2.2 In order to attain these objectives, the DNER, an agency of the federal government with jurisdiction over highways, and the states of Minas Gerais and São Paulo have developed a specific project for widening and modernizing the Belo Horizonte-São Paulo section, whose total length is 563 km. The project provides for improvement of the technical characteristics of the highway and expansion of its capacity to effectively accommodate traffic volumes currently varying between approximately 4,500 and 54,000 vehicles per day. Stage I of the project includes works on a section approximately 269 km in length: approximately 217 km in the state of Minas Gerais (between the 420 km marker in the municipality of Contagem, in the metropolitan area of Belo Horizonte, where the highway intersects with Avenida Amazonas and the 637 km marker - turnoff to the locality of Nepomuceno) and approximately 52 km in the state of São Paulo, (between its intersection in the city of São Paulo with the Presidente Dutra highway (BR-116), which links São Paulo with Rio de Janeiro, (km 90) and its intersection with the Dom Pedro I state highway (SP-61) at km 37.7). This last road is a modern four lane highway linking the metropolitan region of greater São Paulo with Campinas. See maps 1 and 2.
- 2.3 The criteria used to select these sections for the first stage of widening and modernization of the Belo Horizonte-São Paulo highway is based on an analysis of the road's capacity, which revealed that the greatest hindrances to traffic are in the sections near to the two metropolitan areas.
- 2.4 In general, the projects include the following works:

2/ Chapters II, III, IV and V of this document may be supplemented with documents and annexes available in the project technical files.

- (i) Restoration and improvement of 269 km of existing highway, which will serve as one of the divided roadways, with two or more lanes each depending on traffic volumes. More than two lanes have been planned for the sections located in the metropolitan areas of Belo Horizonte and São Paulo. (See map 2 for longitudinal composition).
- (ii) Construction of approximately 269 km of a parallel roadway with technical characteristics similar to those of the existing roadway, to be constructed in the available right of way, including the necessary works and structures.
- (iii) Widening existing bridges and drainage, as necessary.
- (iv) Construction of two parallel tunnels in the section located in the Cantareira range near São Paulo.
- (v) Construction, improvement and widening of the access ramps and urban crossings served by the highway.
- (vi) Placement of road safety devices, including guardrails, horizontal and vertical traffic signs and signals, and supplementary projects for landscaping and environmental protection; and
- (vii) Construction and installation of three toll stations (two in Minas Gerais and one in São Paulo); six highway police control stations (four in Minas Gerais and two in São Paulo) and one station for weighing trucks and trailers in São Paulo (two of these stations already exist in Minas Gerais).

2.5 The widening work called for under the project will provide the existing highway with a transversal section composed of two roadways, each with two traffic lanes 3.5 m wide, external shoulders 2.5 m wide and a 0.60 m internal safety strip. The two roadways will be divided by a separator at least 3 m wide. In some sections, where topographical conditions or other physical restrictions make such a separator impossible, the two roadways will be divided by a rigid "New Jersey" type concrete barrier. Furthermore, in sections located within the Metropolitan area of São Paulo, depending on traffic volumes and urban conditions in the segment, the highway will have two roadways of up to four traffic lanes each, with additional service roadways along the last 4 km, in the city of São Paulo. Map 2 shows the sections that constitute the first stage of the project, identifying the longitudinal development.

2.6 The most important works to be executed include movement of roughly 17.8 million cubic meters of earth to make way for the new roadway

(13.2 million in Minas Gerais and 4.6 million in São Paulo); pavement of 5.3 million square meters with bituminous concrete (3.7 million in Minas Gerais and 1.6 million in São Paulo), and reinforcement of pavement on the existing roadway; the installation of 65,000 linear meters of various types of culverts (alcantarillas) (44,200 meters in Minas Gerais and 20,800 meters in São Paulo); the construction of 25 bridges in Minas Gerais with lengths varying between 20 m and 390 m, 52 viaducts (12 in Minas Gerais and 40 in São Paulo) with lengths between 30 m and 266 m and 17 foot-bridges (one in Minas Gerais and 16 in São Paulo) with lengths of 25 m to 218 m; strengthening and widening of 27 existing bridges (26 in Minas Gerais and one in São Paulo) with lengths between 15 m and 380 m; construction of 59 intersections and interchanges (42 in Minas Gerais and 17 in São Paulo); construction of seven urban through streets with a special project in Minas Gerais; in addition to the two tunnels mentioned above, both 250 m in length, one with two traffic lanes and the other with three counting the additional uphill lane.

C. Cost

1. Total cost

- 2.7 The total cost of the project has been estimated at the equivalent of US\$534 million, with the following breakdown according to investment category and financing source:

Project Cost and Financing (in thousands of US\$)						
Investment Category	IDB Loan	Local Counterpart			Total	%
		Departmen t of National Revenue	State of Minas Gerais	State of São Paulo		
1. <u>Engineering and administration</u>	--	900	19,035	10,730	30,665	5.8
1.1 Supervision	--	--	16,695	9,800	26,495	5.0
1.2 Administration	--	900	2,340	930	4,170	0.8
2. <u>Direct costs</u>	232,225	91,948	44,580	30,105	398,858	74.7
2.1 Construction	232,225	91,948	44,580	30,105	398,858	74.7
3. <u>Associated costs</u>	--	--	3,545	15,180	18,725	3.5
3.1 Rights of way	--	--	3,545	6,150	9,695	1.8
3.2 Relocation of families	--	--	--	9,030	9,030	1.7
4. <u>Financial costs</u>	2,670	27,941	--	--	30,611	5.7
4.1 Interest	--	27,157	--	--	27,157	5.1
4.2 Credit fee	--	784	--	--	784	0.1
4.3 IDB inspection	2,670	--	--	--	2,670	0.5
5. <u>Unallocated</u>	32,105	12,711	6,120	4,205	55,141	10.3
5.1 Escalation	6,007	2,378	1,110	821	10,316	1.9
5.2 Contingencies	26,098	10,333	5,010	3,384	44,825	8.4
Total	267,000	133,500	73,280	60,220	534,000	100.0
Percentage	50.0	25.0	13.7	11.3	100.0	

2. Components of the total cost

a. Engineering and administration (US\$30,665,000)

(i) Supervision (US\$26,495,000)

2.8 This subcategory includes the cost of supervision and technical monitoring of the works, to be carried out both in Minas Gerais and in São Paulo by one or more consulting firms specialized in highway engineering. This cost amounts to 6.6% of the direct cost of planned construction.

(ii) Administration (US\$4,170,000)

- 2.9 Costs covered by this item include full-time personnel hired by DER/MG for the executing agency responsible for administering project execution in that state, estimated at US\$1,125,000 equivalent. The equivalent of US\$1,215,000 corresponds to the services of a consulting firm to advise DER/MG on the administration and execution of its part of the project. The amounts of US\$930,000 and US\$900,000 corresponds to the cost of consulting firms to be hired by DER/SP and the DNER respectively to assist them in economic-financial monitoring of their portions of the project.

b. Direct costs (US\$398,858,000)

- 2.10 This category relates to construction work in connection with widening and modernization. These costs have been determined on the basis of the volume of works to be executed in accordance with the final engineering designs. Unit prices for basic salaries, the cost of renting construction equipment and machinery and current prices for materials and other inputs in the construction market as of December 1992 has been applied to the volume. Aside from the cost of constructing the highway itself, this item also covers the cost of building the toll stations, highway police control stations, and weighing stations for cargo vehicles. Annex II-1 provides a breakdown of construction cost according to main category of works.

c. Associated costs (US\$18,725,000)

(i) Rights-of-way (US\$9,695,000)

- 2.11 This item relates to the cost of acquiring additional rights-of-way where needed for the construction of viaducts, intersections, footbridges and similar facilities. Out of the total, US\$3,545,000 corresponds to Minas Gerais and US\$6,150,000 to São Paulo (see paragraphs 3.7 and 3.8).

(ii) Relocation of families (US\$9,030,000)

- 2.12 This amount covers the cost of relocating approximately 602 families now illegally occupying part of the Fernão Dias right-of-way (BR-381) in São Paulo (see paragraphs 3.9 to 3.13 inclusive). There is no such problem in Minas Gerais.

d. Financial costs (US\$30,611,000)

- 2.13 This category includes: (i) interest on the Bank loan accruing during the execution period (US\$27,157,000); (ii) the corresponding credit fee (US\$784,000); and (iii) the cost of inspection and supervision by the Bank (US\$2,670,000).

e. Unallocated (US\$55,141,000)

- 2.14 This category covers: (i) the escalation of prices after formulation of the basic budgets (December 1992) and throughout execution of the works; and (ii) the cost of unforeseen contingencies resulting from the design of the works and attributable to the construction market.
- 2.15 The cost of price escalation (US\$10,316,000) was calculated on the basis of the external inflation indices projected by the Bank for future years. It is expected that internal inflation will be offset by devaluation of the Brazilian currency. The amount allocated to cover contingencies (US\$44,825,000) corresponds to 10% of the basic estimated cost, for the works as well as supervision, administration and associated costs.

D. Financing

1. Bank resources

- 2.16 The Bank will contribute the equivalent of US\$267 million to project financing to be disbursed in foreign exchange chargeable to the ordinary capital. This amount equals 50% of total project costs.
- 2.17 Bank financing will cover: (i) 58.2% of the direct construction costs; (ii) 8.7% of the financial costs, (the borrower will cover interest on the Bank loan during project execution with local counterpart resources); (iii) 58.2% of the unallocated expenses; and (iv) the cost of Bank inspection and supervision.
- 2.18 The Bank loan will be subject to the following conditions:

<u>Item</u>	<u>Ordinary capital</u>
Amount	US\$267,000,000
Interest	Variable
Credit fee	0.75%
IDB inspection fee	1% of the loan
Amortization	20 years
Disbursement	4 years
Grace period	4 years

2. Local counterpart

- 2.19 The local counterpart, US\$267 million equivalent, will cover the remaining 50% of total project costs. It will be composed of budgetary allocations from the Department of National Revenue totaling US\$135.5 million equivalent (50% of the local counterpart); budgetary allocations from the state of Minas Gerais totaling US\$73,280,000, equivalent (27.4% of the local counterpart); and budgetary allocations from the state of São Paulo totaling US\$60,220,000 equivalent (22.6% of the local counterpart).

Participation by the states of Minas Gerais and São Paulo in the local counterpart is directly proportional to the cost to be incurred in each state. The local counterpart will be used to finance: (i) the total cost of supervising and administering the project; (ii) part of the direct cost of construction of the works (41.8%); (iii) the interest and credit fee payable in connection with the Bank loan, i.e. 91.3% of the financial costs; and (iv) a portion (41.8%) of the specific unallocated costs.

- 2.20 In accordance with the practice adopted by the Bank in the great majority of loan operations for Brazil, engineering and administration costs (the use of local consulting firms) will be financed entirely with resources from the local counterpart, because the selection procedures established by Brazilian law are incompatible with those used by the Bank. This arrangement has in all previous cases made it possible to avoid complaints or claims concerning the selection processes.
- 2.21 In this regard, it should be noted that the country has a sufficient number of qualified, reputable engineering consulting firms to meet the requirements of the project in terms of quality and competitive pricing of services.

III. PROJECT EXECUTION

A. Executing agency

- 3.1 Bank financing will be provided to the Federative Republic of Brazil and the executing agency will be the DNER, an agency connected with the Ministry of Transportation, with autonomy and responsibility for planning, coordination, execution, administration, monitoring and maintenance of the federal highway system. The institutional and financial capacity of the DNER is analyzed in Chapter IV of this document.
- 3.2 For project execution, the DNER has determined the constitution of a specific management unit responsible for coordination, monitoring and management of activities related with the project. This unit will report to the Director of Highway Engineering, under the Director General of the DNER and will be entrusted with informing the Bank on all aspects of the project. In performing its functions, this unit will coordinate the information and other elements it receives from the units entrusted with the project in the Minas Gerais and São Paulo state highway departments, agencies to which the DNER, by special agreement, has delegated project execution with regard to public bidding, contracting and supervision. This agency will hire a consulting firm to provide economic-financial monitoring services for the project.
- 3.3 The DER/MG has in turn established an executing unit for the project reporting directly to the general management of the agency and responsible for technical, administrative, financial and environmental monitoring of the project. The unit will also engage the services of a consulting firm. It should be noted that DER/MG established a similar structure for the execution of two highway programs previously financed by the Bank, and obtained good results.
- 3.4 In the case of the state of São Paulo, the administration and monitoring of project execution will be performed directly by the DER/SP through its highway districts No. 1, headquartered in Campinas and No. 10 headquartered in São Paulo, which reports to the agency's operation division. Coordination with the DNER will be entrusted to a technical and financial committee established by internal decision in June 1993. The DER/SP will hire specialized consulting firms to provide assistance and support in the economic-financial supervision of the project, and in connection with environmental matters.
- 3.5 These arrangements for the administration of project execution have been examined by the Bank and have been found consistent with its needs, the installed capacity of the executing agencies and the requirements imposed by the execution. In addition, both the DNER,

the DER/MG and DER/SP have taken measures to incorporate the arrangement described.

B. Engineering designs and construction plans

- 3.6 At the present time the following are available: technical studies; final engineering designs; detailed construction plans for all of the highway works, such as bridges, viaducts, tunnels and other planned civil works; general and particular technical construction specifications; and other documents required for execution of the project works. For the preparation of these technical documents topographical, hydrological, geological, geotechnical, environmental and other studies were conducted as required for satisfactory execution of the works according to the plans. The Bank has revised all of these studies and technical documents and has determined that they are sufficient and satisfactory. Furthermore, the required socioeconomic feasibility studies have been conducted for the project and are analyzed in Chapter V.

C. Rights-of-way

- 3.7 In projecting the widening and modernization of the Fernão Dias highway efforts were made wherever possible to maintain the current alignment, which meets technical and environmental protection standards. In some subsections, however, plans call for detours and lateral widenings, turnoffs to intermediate towns, viaducts and interchanges, drainage and other special structures such as footbridges necessitating the acquisition of additional land.
- 3.8 In this regard, the system of land acquisition for the rights-of-way of the highway works in Brazil is expeditious and permits the immediate possession of the land required even though the expropriation formalities have not been completed. Nonetheless, before calling for bids on any of the sections or elements of the project, the borrower must demonstrate to the Bank that it has legal possession of the additional land that may be necessary for the placement of any of the project works (see Recommendations, Appendix II).

D. Relocation of families

- 3.9 As indicated earlier, construction of the São Paulo project will require the relocation of 602 very low-income families that have settled illegally within the right-of-way of the Fernão Dias highway (BR-381), in the municipality of Guarulhos. A plan has been prepared to move these families to housing owned by the system of Companhia de Habitação e Desenvolvimento Urbano [Housing and Urban Development Company] (CHDU) of the state of São Paulo, which covers the selection and clearing of the necessary land, the construction of housing and relocation of the families concerned. In the drainage project for the municipality of São Paulo, financed by the Bank with loan 233/IC-BR, the participation of the institutions responsible for relocating approximately 1,600 families was

successful, so no problems are anticipated in relocating the 602 families affected by the proposed project.

- 3.10 The relocation plan presented and analyzed by the Bank is preliminary in nature, and consequently, it is proposed that before awarding the contract for the works on the highway section located in the municipality of Guarulhos, the borrower should present the detailed resettlement plan for the families affected by the project in that municipality. The borrower should prepare this plan based on the socioeconomic and physical-territorial information collected on the families affected (see Recommendations, Appendix II). It is not advisable to have the detailed plan prepared in an earlier stage, in order to prevent the official notice from leading to new families occupying the area illegally in order to gain the benefit of relocation.
- 3.11 In order to ensure relocation of the families in question it is recommended that prior to physical initiation of the works on the section located in the municipality of Guarulhos, the borrower, through the executing agency, should present to the Bank evidence that the relocation of the families affected by the project has begun (see Recommendations, Appendix II). A "favela" next to the Cabuçu creek is situated within the right of way in the municipality of Guarulhos. This affects a 4 km section of the Fernão Dias highway which is the object of a bidding package. Consequently, the relocation process does not affect other sections in the state of São Paulo.
- 3.12 It is also recommended that the semiannual progress reports include, inter alia, the following information: (i) number of families relocated; (ii) location of the new houses, description, characteristics and public services offered; and (iii) the extent to which the conditions set forth in the relocation plan have been fulfilled (see Recommendations, Appendix II).
- 3.13 It should be restated that in the case of Minas Gerais it is not necessary to relocate families, since the occupants of the areas to be expropriated legally own their homes and will be indemnified in accordance with current legislation governing expropriations for public utility.

E. Execution procedures

- 3.14 The project works will be executed by construction contractors to be awarded works contracts in accordance with international public bidding and prequalification procedures meeting the Bank's requisites in this area. The bidding and contracting of the works are based on Bank procedures to be set forth in Annex B to the loan contract.
- 3.15 For the purposes of bidding and contracting, the project works have been divided into two groups. The first group covers nine sections

approximately 217 km in length located in the state of Minas Gerais beginning in Contagem in the metropolitan area of Belo Horizonte. The second group includes six sections approximately 52 km in length located in the state of São Paulo. Annex III-1 provides information and the estimated cost of these contracts.

- 3.16 The international public bidding on the project will relate to all the works to be completed, including bridges and viaducts; civil works for the toll, weighing and highway police stations; and in the Serra da Cantareira section, the two planned tunnels. In all cases, the Bank's standards and procedures agreed upon with the Bank in this area will be followed permitting the participation of national and foreign building companies without restriction. Consequently, the bidding documents will enable bidders to submit proposals for execution of one or more of the bidding packages.
- 3.17 It should be pointed out that though relatively extensive in volume, the works for the project are a matter of common highway engineering practice not requiring any special or advanced technology unobtainable in Brazil. Consequently, there is sufficient capacity in the country to minimize the likelihood of any problems arising in project execution.
- 3.18 As already indicated, technical supervision and monitoring of the quality of the works will be carried out by highway engineering consultants hired exclusively for this purpose. These firms will conduct their work in accordance with the terms of reference previously accepted by the Bank. As for the Cantareira range tunnels, the consulting firm to be hired for supervision of the section in which they will be built, aside from demonstrating capacity for supervising highway and structural works, will provide evidence of sufficient experience in supervising tunnels similar to those planned.
- 3.19 As the condition precedent at the first disbursement of resources from the Bank loan, it is proposed that the borrower, through the executing agency, present evidence to the Bank's satisfaction that DNER and the co-executing agencies have hired the consulting services necessary for execution of the project in accordance with terms of reference considered acceptable by the Bank (see Proposed Resolution, Appendix I).
- 3.20 The consulting contract indicated will be awarded to engineering firms using procedures established by current Brazilian law, and its cost will be entirely covered with resources from the local counterpart (see paragraphs 2.20 and 2.21). However, the terms of reference that serve as a basis for the respective hirings will indicate the minimum personnel necessary, the engineering equipment and laboratories required, the nature and frequency of the technical and administrative controls to be carried out, and the content and frequency of the reports to be presented. These terms of reference will be subject to approval by the Bank prior to the

initiation of contract formalities. Before contracting services, the borrower, through the executing agency, must inform the Bank of the names and references of the firms selected and the price for each (see Annex A to the Contract, Appendix III).

F. Advance bidding and contracting for work and services

- 3.21 In order to take the greatest possible advantage of the next dry season, the Bank has expressed its willingness for the bidding and contracting process for the project works to begin prior to approval of the loan requested. The project team has reviewed the bidding conditions and has found them satisfactory. The bidding on all of the project works was commenced by DER/MG and DER/SP. It is expected that the contracts will be awarded in August or September 1993, since the conditions set out in Bank procedures have been satisfied with respect to publications and notices at embassies of Bank member countries that are represented in Brazil. Furthermore, the DNER, DER/MG and DER/SP will also hire before this date the consulting firms to advise on supervision and/or administration of the project.

G. Execution period and investment timetable

- 3.22 The period of execution of the project will be four years from the effective date of the loan contract. This period is compatible with the type and volume of project works, the construction procedures to be used to maintain the normal flow of traffic and the institutional capacity of the executing agency and co-executing agencies, and should allow the Department of National Revenue and the states of Minas Gerais and São Paulo to effect the local counterpart funding.
- 3.23 Based on the timetable for execution of the project, the following tentative investment timetable has been developed.

ANNUAL INVESTMENT TIMETABLE (in US\$000s)					
SOURCE	YEAR				TOTAL
	First	Second	Third	Fourth	
<u>IDB loan</u>	<u>54,268</u>	<u>80,089</u>	<u>105,932</u>	<u>26,701</u>	<u>267,000</u>
<u>Local counterpart</u>	<u>69,314</u>	<u>70,407</u>	<u>92,983</u>	<u>34,296</u>	<u>267,000</u>
Department of National Revenue	24,547	35,976	50,160	22,817	133,500
State of Minas Gerais	19,506	20,920	25,879	6,975	73,280
State of São Paulo	22,261	13,511	16,944	4,504	60,220
TOTALS	123,582	150,506	198,915	60,997	534,000
PERCENTAGES	23.1	28.2	37.3	11.4	100.0

H. Recognition of previous expenditures

- 3.24 According to the programming for project execution expenses, the amount of US\$350,000 for financing of the executing unit of DER/MG and of the consulting firms that will advise the DNER, DER/MG and DER/SP on project administration will be recognized as part of the local counterpart contribution (see Recommendations, Appendix II).

I. Advance of funds

- 3.25 Depending on the anticipated rate of execution of the works of the project, at the express request of the borrower funds may be advanced from the Bank financing up to the equivalent of 10% of the loan amount.

J. Maintenance of highway BR-381

- 3.26 The body responsible for maintaining federal highway BR-381 is the DNER. According to the policy of this agency, maintenance of highway BR-381, the sections of São Paulo-Belo Horizonte-BR-116 (Governador Valadares) junction is performed by means of specific contracts with private companies, which are administered and supervised by the local offices of the DNER. Maintenance of the section corresponding to the Fernão Dias highway is supervised by the Oliveira and Pouso Alegre office in Minas Gerais and Guarulhos in São Paulo.

- 3.27 In order to ensure proper maintenance of highway BR-381, the borrower, through the executing agency, must undertake to properly maintain the paved sections of this highway São Paulo-Belo Horizonte-junction with BR-116 (Governador Valadares), its immediate access points and equipment in accordance with acceptable technical standards and must submit to the Bank before August 31, of each year for ten years after the effective date of the loan contract, maintenance reports that will include, inter alia, an evaluation of the results of maintenance during the previous year and a maintenance plan for the following fiscal year, including a proposed budget for its implementation (see Recommendations, Appendix II, and Annex A, Appendix III).

K. Weight control

- 3.28 As indicated earlier, the project includes the construction of a weighing station for weight control in the São Paulo section. In the section located in Minas Gerais there are now two stations that were constructed several years ago but which were not placed in operation, even though they have the necessary equipment. Upon completion of the project these stations will be activated along with those to be built in São Paulo. It is considered that three truck weighing stations are sufficient, insofar as DNER can perform spot checks using mobile scales available in the highway districts.

- 3.29 Given the background with respect to the inactive status of the existing weighing stations in the federal highways, it is recommended that the borrower be required to submit to the Bank, within the fourth year from the effective date of the loan contract, evidence that weight control is effectively being performed on vehicles circulating on the Fernão Dias highway (BR-381). Furthermore, the borrower must present annually to the Bank for a period of ten years from the effective date of the loan contract, a report containing the results obtained during the previous year including statistics with respect to the number of transport vehicles weighed at each station, the number and volume of excess loads found, and penalties imposed. Information will also be completed on the amount of tolls collected (see Recommendations, Appendix II, and Annex A, Appendix III).

L. Tolls

- 3.30 As indicated earlier, the project includes the construction of three (3) toll stations for vehicles circulating on the Fernão Dias highway (Belo Horizonte-São Paulo section). Two of these stations will be located in Minas Gerais and the other in São Paulo. The number and location are sufficient, insofar as the collection will be made at strategic points, to cover most of the vehicles, outside of metropolitan areas of internal traffic. The form of collecting the amount to be paid and establishment of the system will be the subject of study, whose presentation in its specific plan is explained in detail further on. On the São Paulo state highways subject to the payment of tolls, the stations are located so as to collect tolls for both outbound and return in a specific section, in order to realize economies with respect to installation and personnel cost. In the proposed project, one toll station in the São Paulo section is considered sufficient insofar as approximately 15 km of highway is located in the urban area of the city of São Paulo.
- 3.31 It is recommended that the borrower be required during the second year from the effective date of the loan contract to present to the Bank a detailed plan for the operation of these stations and implementation of the tolls in question, calculated so as to cover at least the cost of investment in maintenance, operation and administration of the sections included in the project, taking into account the cost in terms of alternate routes and means of transportation. Toll collection should be operational upon completion of the project works (see Proposed Resolution, Appendix I). Similarly, the borrower must submit to the Bank, every year for a period of ten years from the effective date of the loan contract, certifying evidence that tolls continue to be collected in the aforementioned highway, indicating in the annual reports the amounts so collected (see Recommendations, Appendix II).

- 3.32 The period of two years from the signature of the contract for presentation of the plan and four years for the initiation of toll collection are considered reasonable, in that it will be necessary to perform detailed studies, process and legalize collection and await for the toll booths to be built and toll collection equipment to be procured.

M. Environmental protection

1. Classification and general framework of the studies

- 3.33 The project has been classified by the CMA as a Category III operation according to the characteristics of the service area, which has been occupied for some time, and the direct and indirect impact identified and analyzed in the Environmental Impact Assessment (EIA), and the corresponding Environmental Impact Report (RIMA). These documents were reviewed by the project team, which found their content, presentation and conclusions to properly cover all aspects concerning the environment of the project area.
- 3.34 The environmental summary for the project, approved by the CMA at its meeting on May 18, 1993, presents general information on the project, its description, the importance of the Fernão Dias highway and its service area, aspects related to the ecosystems characterizing the region and their current condition. It also describes the socioeconomic process of occupying the service area of the highway, the main production categories and those which will emerge in the future. It analyzes in detail the main environmental impact of the project, positive as well as negative, direct and indirect, as well as mitigating measures to be taken. After analyzing the institutional aspects for compliance with the measures proposed for mitigating the direct and indirect impact of the project on the environment, it formulates general conclusions and recommendations to be included in the loan contract.

2. The environmental impact of the project

a. Indirect impact

- 3.35 The negative indirect impact on the environment resulting from the project will not lead to significant alterations in the service area insofar as the land area was occupied in the past and the economic activities are in large part consolidated and defined. However, some economic activities, primarily agricultural and industrial, may be able to be established in the service area and/or in some of the urban areas of the state of Minas Gerais, near the border with the state of São Paulo.
- 3.36 In order to introduce this process, state and municipal authorities, according to the type of activity, will have to comply with pertinent laws and regulations, following the recommendations of

the environmental impact assessment and RIMA report for each case. Appropriate legislation is on the books and the Minas Gerais and São Paulo Ministries of the environment and their offices have the institutional capacity needed to comply with the legislation.

b. Direct impacts

(i) Adverse impacts

- 3.37 The project's adverse indirect impacts relate to execution of the works and are localized primarily in the right-of-way, the quarries and equipment storage areas, and the watersheds through which the highways runs. The direct adverse impacts can be properly controlled and/or mitigated by adopting the measures proposed in the EIA-RIMA, which will form part of the instructions to the works contractors.

(ii) Beneficial impacts

- 3.38 Execution of the project will help to reduce travel time between São Paulo and Belo Horizonte and intermediate points along the highway, and thus lower gasoline, diesel fuel and lubricant costs. The new design of the highway will significantly improve safety for users and a reduce the number of accidents; its execution will favor the environmental protection activities described in the following paragraph.

3. Principal environmental protection measures

- 3.39 The environmental impact assessment (EIA) and the corresponding report (RIMA) proposed various actions to alleviate, control and or prevent the various direct impacts derived from execution of the construction projects. These studies and the measures proposed are appropriate in terms of content and scope. The environmental summary describes these measures in detail, and this document cites only the main items: (i) prevention and control of erosion; (ii) pollution control and safety in work areas; (iii) restoration of construction areas and utilization of materials; (iv) preservation of native vegetation and landscaping; (v) protection of water resources; (vi) measures in the areas of environmental interest intersected by the project; (vii) resettlement of families; (viii) environmental protection areas; and (ix) other measures connected with preservation of the archaeological heritage and safety for highway users.

4. Approval of licenses resulting from the EIA-RIMA

- 3.40 The environmental impact assessments have formally been submitted to the Ministry for the Environment and the State Foundation for the Environment (FEAM) of the state of Minas Gerais, as well as the Ministry for the Environment (SMA) and its respective agencies in the state of São Paulo. In that these studies were prepared in

accordance with the terms of reference approved by the same organizations, the preliminary licenses for and ratification of the works were obtained from the Brazilian Environmental Institute (IBAMA).

5. Institutional aspects

- 3.41 With respect to direct impact, the implementation of the recommendations will have adequate technical-institutional support because the co-executing agencies (DER/MG and DER/SP) have professionals within their institutional structure who specialize in environmental issues. In addition, both agencies have the support of consulting firms for supervision of the construction project. Minas Gerais is obligated to include professionals and technicians specializing in the environment and São Paulo will contract a specialized consulting firm to provide advice and support in this area.
- 3.42 With regard to indirect impacts, the specialized agencies, GEAM in the state of Minas Gerais and SEMA in the state of São Paulo, have institutional structures that allow them to issue standards and to provide advisory services, control and supervision on the actions needed to control the indirect impacts. In addition, applicable legislation requires that any new industrial activity to be set up which may have negative effects on the environment according to current standards must obtain preliminary installation and operation licenses.

6. Recommendations

- 3.43 On the basis of the EIA-RIMA studies prepared for the project and the analysis performed, it is recommended that:
- (a) Prior to awarding the contract for works on the section located in the municipality of Guarulhos, the borrower should present to the Bank the relocation plan for the families described in paragraph 3.10, and before starting work on the works in the same section, the evidence indicated in paragraph 3.11 of this document.
 - (b) Within 24 months of the effective date of the loan contract, the borrower should submit the studies to be prepared by the state of Minas Gerais to establish and regulate the environmental protection area (EPA) in the basin of the Jaguari-Camanducaia and Sapucaí-Sapucaí Mirim rivers (see Recommendations, Appendix II).
 - (c) Within 36 months of the effective date of the loan contract, the borrower should submit evidence that the state of Minas Gerais: (i) has allocated sufficient resources to initiate the implementation of the aforementioned EPAs; (ii) has undertaken to include in the proposed annual budget resources necessary to

complete implementation of the EPAs; (iii) that implementation of the EPAs has been initiated (see Recommendations, Appendix II).

- (d) During the fourth year following the effective date of the loan contract, the borrower must demonstrate that it has put into effect the manual of operations for emergency situations establishing the procedures that will govern such operations in the case of accidents involving vehicles transporting toxic and hazardous substances that could contaminate the soil and water resources (see Recommendations, Appendix II).

N. Measures to contend with the effects of natural disasters

- 3.44 The region of the project and the country as a whole have not recorded seismic movements that might affect the project works. The DNER design standards for drainage and special structure works such as bridges and viaducts, establish the necessary measures with respect to flows and high water levels to consider for the execution of these works in order to reduce to a minimum the risk of damage and material loss in the event of extraordinary rainfall. The project region is also not subject to hurricanes and tornados.

O. Ex post evaluation

- 3.45 The Bank has consulted with the DNER as necessary in order to determine if the executing agency considers it useful and necessary to conduct an ex post evaluation of the project. The response received in the Bank indicates that the DNER considers such an evaluation unnecessary, based on the following arguments: (i) the DNER and the Empresa Brasileira de Planejamento do Transporte, periodically effect evaluation of the highway project executed in the Fernão Dias highway network; and (ii) in that the proposed project includes the first stage of modernization and widening of the Fernão Dias highway, ex post evaluation upon completion of the works of the second stage covering the total length (563.2 km) of the São Paulo-Belo Horizonte section would be justified.

IV. THE BORROWER AND THE EXECUTING AGENCY

A. Institutional analysis

1. The borrower

- 4.1 The borrower will be the Federative Republic of Brazil, which will also be responsible for servicing the debt incurred through the proposed partial loan from the Bank.

2. The executing agency - National Highway Department (DNER)

- 4.2 The executing agency will be DNER, which will assume responsibility for executing the project. However, under the agreement signed on May 17, 1993, the Ministry of Transport, through DNER, will delegate to DER/SP and to DER/MG its responsibility for the engineering works and project-related services within their respective jurisdictions. This arrangement will leave DNER exercising general project supervision while DER/MG and DER/SP, assisted by consulting firms, carry out technical control and inspection of works.

a. Nature and functions

- 4.3 DNER is an autarkic agency connected with the Ministry of Transport, responsible for the planning, coordination and monitoring of the federal highways system as well as execution of the policies regulating it. Its legal basis is found in decree no. 8463 of 1943 as amended, and in the bylaws adopted in 1991.
- 4.4 As executing agency of the project, DNER will be charged with the following functions: (i) supervision, approval and general technical oversight, including inspection visits; (ii) administration and monitoring to ensure compliance with agreements and liaison with federal agencies and the Bank; and (iii) financial control in connection with requests to disburse Bank funds and the release of counterpart in coordination with the DER/MG and DER/SP, such control also to encompass financial and accounting records and the submittal of annual statements for examination by the Ministry of Finance's Ministry of the Department of National Revenue, which will be in charge of auditing the project. Chapter III covers institutional coordination between the executing agency and the co-executors, as well as the project's execution procedures.

b. Organizational structure

- 4.5 DNER's current structure has the following levels:

- Governing body: Board of Directors;
- Offices directly assisting the General Director: Office of the Director General and Office of the Technical Adviser;

- Sectional divisions: Division of Legal Affairs, Internal Audit Division, and Administration and Finance Division;
 - Technical divisions: Highway Engineering Division, Highway Operations Division and Technological Development Division;
 - Regional bodies: Federal Highway Districts (DFRs).
- 4.6 The reorganization process that has been begun aims at administrative decentralization and, as noted in chapter I, at the transfer of part of the national highway network to the states. It is to be implemented through revision of the National Transportation Plan (PNV), 3/ under a bill awarding approval by the National Congress.
- 4.7 This entire process will require the adjustment of DNER's organizational structure to its new function both in planning, which will have to be decentralized toward the regional districts, and in the execution and control of operations. The process may possibly culminate in a new institutional model for the agency, in line with the new strategies and policies to be devised for the highway sector in the revision of the PNV.
- 4.8 Although the field of action ultimately defined by DNER will bring forth a new institutional configuration, it should be pointed out that its current organizational structure is acceptable for purposes of its functions, including those it will have to carry out as the project is executed.

c. Human resources

- 4.9 The restructuring of DNER, which began in 1989, led to substantial personnel changes, including replacements in all areas and a considerable quantitative reduction. These measures resulted in difficulties and delays in routine operations which also affected the execution and control of the projects it was carrying out, including the one partially funded by loans 150/IC-BR and 503/OC-BR. Those difficulties were eventually overcome.
- 4.10 The current pay scales are inadequate to satisfy the staff. Job descriptions must also be updated to define responsibilities and powers. To improve the expertise of its professional employees, DNER is preparing a human resources assessment coupled with a training program for managers and maintenance technicians financed by the World Bank.
- 4.11 The DNER personnel roster at December 31, 1992 breaks down as follows:

3/ Plan Nacional de Viação.

DNER - Active employee roster		
Organizational unit	Quantity	%
Office of the General Director	105	1.3
Administration and Finance Division	156	1.9
Technological Development Division	163	2.0
Highway Engineering Division	52	0.6
Operations Division	61	0.7
Federal Highway Districts	6,895	83.7
Personnel to be reclassified	805	9.8
Total	8,237	100.0

- 4.12 At 20% below average staffing for the last three years and 45% below that in place at the close of operations for 1990, the current complement reflects sizable cuts. Staff size will be defined in the modernization process, which will be resumed shortly.

d. Financial administration and control system

- 4.13 Financial resources are administered by the Finance Division, which belongs to DNER's Administration and Finance Division. The former is charged with execution and control of the agency's budget. Each division and regional district manages its own budget, committing resources in accordance with the schedules approved for the various programs. Financial management falls under the Integrated Financial Administration System (SIAF) administered by the Department of National Revenue Department under the "single account" concept. Under that concept, each public agency functions as a "depository of assets," with payments effected through accounts controlled by that department. All the activities mentioned show an acceptable level of execution and control.
- 4.14 The transactions carried out by DNER are governed by a system of internal and external control. Federally required audit activities are conducted at the following levels: (i) internal audit, (ii) internal audit of the Ministry of Transport, (iii) Ministry of the Department of National Revenue, and (iv) Court of Auditors of the Union. Each unit involved acts within its own scope and under its own authority, and their work is considered acceptable.
- 4.15 The Ministry of the Department of National Revenue (STN) conducts the external auditing of projects or programs funded by multilateral credit agencies. It is therefore recommended that during the execution period the project's financial statements be

submitted annually with that Ministry's report (see Recommendations, Appendix II).

3. Co-executing agencies

a. Minas Gerais State Highway Department (DER/MG)

- 4.16 As was indicated, DER/MG will, under the agreement, be responsible for the construction, technical control and inspection of projects completed within its purview, for which purpose it will be assisted by specialized consulting firms.

(i) Nature and functions

- 4.17 DER/MG, an autarkic entity with corporate legal status, forms part of the indirect administration of the state public sector. It enjoys financial and administrative autonomy and is linked to the executive branch through the State Ministry of Transport and Public Works.
- 4.18 DER/MG's basic functions, which are performed in adequate fashion, include: (a) participation in the preparation of the state highway and transport plan; (b) planning, coordination and control of the state's highway construction efforts; and (c) execution of the road construction, paving, maintenance, recovery and improvement services slated for the state and delegated federal network.

(ii) Organizational structure

- 4.19 DER/MG's present organizational plan enables it to discharge its basic responsibilities and those pertaining to the execution of the proposed project. Its structure is as follows:
- office of the General Director (senior assistants, legal adviser);
 - office of the Deputy General Director (office of the adviser of planning and coordination; officer of the technical standards adviser; data processing division; surveying and bidding division; audit division);
 - divisions (projects, construction, maintenance, financial and administrative affairs).

(iii) Human resources

- 4.20 Personnel-related activities are handled by the Human Resources Division, which performs this task creditably as part of the DER/MG's Financial Administration Division.
- 4.21 In the last five-year period, DER/MG staff numbered an average of 10,000 employees, in comparison with which the present 8,750 figure represents a reduction of 13%. This cut reflects the decision not to replace employees who leave the agency. This policy has reduced

the total roster by 44% in the last nine years. Staff distribution by geographic region shows that headquarters staff accounts for 15% of the total and the regional districts of the state's interior 85%.

4.22 The current DER/MG personnel roster breaks down as follows:

DER/MG - Active personnel roster		
Organizational unit	No. of employees	%
Office of the General Director	137	1.6
Office of the Deputy General Director	236	2.7
Financial-Administrative Division	286	3.3
Maintenance Division	7,177	82.0
Projects Division	335	3.8
Construction Division	429	4.9
Public Transport Division	150	1.7
Total	8,750	100.0

4.23 Plans call for an additional gradual reduction of about 10% per year, to be achieved by not replacing staff that take voluntary retirement. With the remaining staff, DER/MG will be able to perform its work on the highway network quite satisfactorily.

(iv) Financial administration and control system

4.24 DER/MG's financial-administrative division is responsible for directing, coordinating and controlling the financial, accounting and budgetary activities, including the control of assets, materials and support services. Routine budgetary-financial control is computerized and carried out through subprograms and activities, and it is centralized at agency headquarters. However, budget management is decentralized at the level of the fifty technical-administrative units of the state's interior.

4.25 Those tasks are performed satisfactorily, and they include the administration of the agency's operating costs and the work entailed in paying out short-, medium- and long-term financial commitments, which is done through the Department of Revenue of the state of São Paulo. The existing control system includes a technical-administrative audit unit which reports to the office of the deputy general director. The tasks follow a previously prepared program and are executed using accepted audit procedures. The organizational structure and the staff assigned to these duties are adequate to the purpose.

- 4.26 External control of DER/MG activities is conducted through agencies of the state public administration, especially the Ministries of Transport Public works, Finance, and Planning and the State Court of Auditors, which examines and approves the annual statements submitted.

b. São Paulo State Highway Department (DER/SP)

- 4.27 The state of São Paulo, through DER/SP, will be responsible for construction under the project within its geographic jurisdiction and for technical inspection and control of the work, with the assistance of specialized firms.

(i) Nature and functions

- 4.28 DER/SP, an autarkic entity with corporate legal status and administrative and financial autonomy, belongs to the executive branch through the State Ministry of Road Infrastructure Matters. Its basic aim is to design, plan, build, maintain, operate and administer São Paulo state highways, directly or through third parties. Through delegation agreements with DNER, it administers the federal highways located in the state.

(ii) Organizational structure

- 4.29 The Planning and Transport Divisions and the posts of Assistant Superintendent and Advisor for Financial Affairs were created when the DER/SP was last revised. The current organizational design, includes: Office of the Superintendent, Office of the Legal Adviser, Accounting and Finance Division, and Planning, Engineering, Transport, Administration and Operations Divisions.
- 4.30 This organizational structure enables the agency to deal satisfactorily with the responsibilities assigned to it under the agreement signed with DNER concerning the execution of the project. DER/SP is undergoing an institutional reform program meeting the requirements of World Bank loan no. 2830-BR and including: (i) modification of the organizational structure; (ii) a human resources policy; and (iii) a management control and evaluation system.
- 4.31 The agency's new model of organization allows for directly administered services only when quality is higher and the resulting costs lower than what can be obtained by contracting with specialized firms. Additionally, services must be performed in decentralized fashion and they must be evaluated on the basis of an adequate management information system. The use of consulting services is planned for program implementation in its entirety in 1994.

(iii) Human resources

- 4.32 Personnel-related activities are handled by the Personnel Administration Division of the Administration Division. DER/SP staff breaks down as follows:

DER/SP active personnel		
Organizational unit	Number of employees	%
Office of the General Director	47	0.5
Internal Audit	36	0.4
Office of the Legal Adviser	54	0.6
Public Relations	6	0.1
Accounting and Finance Division	78	0.8
Engineering Division	249	2.7
Administration Division	122	1.3
Operations Division	564	6.2
Planning Division	94	1.0
Transport Division	90	1.0
Office of the Conservation Adviser	11	0.1
Regional divisions	7,853	85.3
Totals	9,204	100.0

- 4.33 The number of employees has declined steadily in recent years. The present complement of 9,204 represents a reduction of 38% in relation to 1988, the result of the large number of retirements in that period. In terms of functional classification, operational personnel accounted for the major share (67%), followed by administrative (22%), technical (10%), and management personnel (1%).

(iv) Financial administration and control system

- 4.34 These activities are under the responsibility of the Accounting and Finance Division, which reports directly to the DER/SP superintendent's office. This division, which will be converted into a unit as part of the department's upcoming restructuring, has charge of the offices of accounting, budget (preparation and control), movement of assets (revenue and expenditure) and toll administration. Modernization is to entail the introduction into DER/SP of a data processing center linked with the field offices of the interior, the acquisition of microcomputers and the preparation of an automation master plan providing for the introduction of a system of management reports.

4.35 Financial resources administration is satisfactory, and it is organized and coordinated with other bodies within and outside DER/SP. The department's control system includes an audit unit, under the authority of the superintendent's office, whose field of action basically encompasses the evaluation of accounting, budget and financial matters and, more superficially, operational matters. Performance of this element of control is acceptable.

4.36 External control of DER/SP is carried out, in generic and appropriate fashion, in conjunction with the oversight practiced by the Ministry of Transport and through the interrelations with the State Ministries of Finance and Planning. The State Court of Audit examines the department's accounts in detail and reports on them.

B. Historical financial analysis 4/ 5/

1. State of São Paulo

a. State resources

4.37 The condensed budgetary payments of the period 1988-1992 are shown in the following table.

4/ The following criteria were used for the historical financial analysis: (1) current monetary values were expressed in end-December 1992 currency; (2) those amounts were converted into United States dollars at the rate of Cr\$12,387.00 - US\$1.00, the last quote for December 1992.

5/ Only the inflows and outflows corresponding to the state's Direct Administration are shown and analyzed, except that the amounts transferred for salary payments to the entities of the Indirect Administration are included under the heading of personnel outlays.

State of São Paulo Consolidated budgetary execution 1988-1992 (US\$ millions)1/						
Category	1988	1989	1990	1991	1992	TOTAL
RESOURCES						
Own revenues	7,768	11,959	11,214	10,260	9,648	50,849
ICMS	7,642	8,779	9,224	8,031	7,356	41,032
Other own revenues	126	3,180	1,990	2,229	2,292	9,817
Linked revenues	3,577	4,375	4,556	3,662	3,173	19,343
ICMS-municipalities	1,910	2,901	3,075	2,677	2,452	13,015
Miscellaneous	1,667	1,474	1,481	985	721	6,328
Credit transactions	909	1,205	1,558	1,707	2,678	8,057
Total resources	12,254	17,539	17,328	15,629	15,499	78,249
EXPENDITURES						
Personnel and social benefits	6,433	7,416	8,289	6,580	6,030	34,748
Other current expenditures	2,067	2,357	2,394	2,172	2,574	11,564
Awards and divestitures	125	149	81	215	822	1,392
Investments	1,700	1,728	2,548	1,784	2,253	10,013
Transfers to firms	2,214	2,186	2,319	1,867	1,553	10,139
Transfers to municipalities	2,302	3,395	3,583	3,093	2,045	14,418
Debt service	1,039	1,359	1,223	1,526	2,222	7,369
Total expenditures	15,880	18,590	20,437	17,237	17,499	89,643
Surplus (deficit)	-3,626	-1,051	-3,109	-1,608	-2,000	-11,394
1/ Exchange rate: Cr\$12,387 = US\$1.00						

- 4.38 The modification of the turnover tax on goods and services (ICMS), which took effect in April 1989 and placed new goods and services in the state's tax base, explains the increase in revenue from that year forward.
- 4.39 The year 1990 saw an additional factor in the growth of ICMS revenues, the ICMS on housing. It entails an increase of 1% over the rates charged for goods and services, as a means of raising additional funds to finance the housing sector. From 1991, ICMS receipts and other tax revenues declined steadily because of the recessionary climate in the country. The same trend is evident in the "Other own revenues" section. The introduction and payment of the surtax on the income tax and the tax on industrial export products is reflected from the period 1989-1990 on, as is the

increase in the tax base and the rates charged for the tax on motor vehicle ownership (IPVA).

- 4.40 The credit transactions show steady growth in the period analyzed, linked to a larger volume of investment, which required resources additional to those of currently generated savings. This development also reflects the increase in internal credit transactions through the issuance of public debt instruments for the payment of letters rogatory and expropriations. The revenues involved result from the segregation of the payments, set at 25% of ICMS and 50% of IPVA receipts, as well as others made to the municipalities.

b. State expenditure

- 4.41 Expenditure by the state for the period 1988-1993 is also shown in the previous table. Personnel costs represent the largest item under the heading of expenditure. The state government is attempting to frame that item within net ICMS receipts, i.e., 75% of the revenues, net of the amounts transferred to state universities and the housing sector. An important increase is evident in ICMS receipts and, concurrently, an increase in the resources destined for the funding of personnel outlays. When the amount collected subsequently declined, an offsetting reduction of that expenditure occurred via the indirect path of monetary devaluation, as a means of balancing expenditure with actually available funds. Meanwhile the level of the other current outlays, represented by supplies and primarily by third-party services, behaved in relatively homogeneous fashion during the period analyzed.
- 4.42 Investments also increased, financed basically with loans; this explains the increase in the state's consolidated debt service. The increase in intergovernmental transfers results from the tax reform, which established a higher percentage, 20% to 25%, in favor of the municipalities, while its relative decline in the last two fiscal years mirrors the general fall in revenues.
- 4.43 The public finances of the state of São Paulo, judging by its budget deficits, reflect a tendency to spend more than the state can take in. Under the applicable law, the balance payable (*restos a pagar*) mechanism was used to finance those shortfalls. This provision allows obligations to be deferred, or, more simply, commitments to be canceled wholly or in part in the following fiscal year.

c. São Paulo State Highway Department (DER/SP)

- 4.44 The execution of the DER/SP budget for 1988-1992 is analyzed by program in the following table. Emphasis in spending has been on highway construction activities grouped in the category of civil works and, to a lesser extent, on conservation and restoration. In addition, personnel cuts and the steady obsolescence of available

conservation equipment accentuated that process, contributing to a decline in productivity.

- 4.45 To overcome those problems, resources were increasingly devoted to periodic maintenance contracts with private firms. A staff training program was introduced recently and the rehabilitation and replacement of equipment has commenced, as part of a program funded by the World Bank.
- 4.46 The DER/SP budget relies on traditional funding sources for revenues, adding one source peculiar to the state of São Paulo. The department collects internally generated revenues in the form of tolls on heavily traveled highways connecting the city of São Paulo with other important centers in the state. This operation brought the Department of Revenue of the state of São Paulo US\$190 million equivalent in the last five years.
- 4.47 The results achieved by Desenvolvimento Rodoviário S.A. [Highway Development, Inc.] (DERSA), a state highway concession company founded in 1969, deserve special mention. By using its acquired technical and managerial capacity it has gradually expanded its scope, as is evident from the rise in toll receipts. DERSA's gross revenues from tolls totaled US\$587 million equivalent in the period 1988-1992.

DER - São Paulo Expenditures by program, 1988-1992 (US\$000s) 1/									
YEAR	CATEGORY	CIVIL WORKS		EQUIP.	STUDIES AND PROJECTS	ROUTINE CONSERV.	RESTOR.	CENTRAL ADM.	TOTAL
		DUPLIC.	OTHERS						
1988	Force acc.								
	Manpower	0	0	0	0	47,903	0	50,768	98,671
	Materials	0	0	0	0	11,335	0	1,853	13,188
	Others	0	0	0	0	12,457	0	23,374	35,831
	CONTRACTS	185,752	125,847	4,355	984	0	103,959	20,105	441,002
	Total	185,752	125,847	4,355	984	71,695	103,959	96,100	588,692
1989	Force acc.								
	Manpower	0	0	0	0	62,904	0	88,312	151,216
	Materials	0	0	0	0	9,476	0	1,403	10,879
	Others	0	0	0	0	11,394	0	15,975	27,369
	CONTRACTS	160,322	143,461	4,058	2,002	0	66,027	28,388	404,258
	Total	160,322	143,461	4,058	2,002	83,774	66,027	134,078	593,722
1990	Force acc.								
	Manpower	0	0	0	0	50,208	0	73,006	123,214
	Materials	0	0	0	0	9,339	1,680	2,259	13,278
	Others	0	0	0	0	24,944	1,043	11,611	37,598
	CONTRACTS	282,808	267,406	2,264	2,996	0	91,580	24,765	671,819
	Total	282,808	267,406	2,264	2,996	84,491	94,303	111,641	845,909
1991	Force acc.								
	Manpower	0	0	0	0	31,930	0	50,008	81,938
	Materials	0	0	0	0	11,147	0	2,085	13,232
	Other	0	0	0	0	19,340	0	23,437	42,777
	CONTRACTS	142,417	40,134	17,553	4,010	0	141,858	16,227	362,199
	Total	142,417	40,134	17,553	4,010	62,417	141,858	91,757	500,146
1992	Force acc.								
	Manpower	0	0	0	0	34,515	0	22,219	56,734
	Materials	0	0	0	0	1,918	0	8,362	10,280
	Others	0	0	0	0	37,255	0	18,368	55,623
	CONTRACTS	217,835	37,177	4,271	13,383	0	162,275	31,896	466,837
	Total	217,835	37,177	4,271	13,383	73,688	162,275	80,845	589,474
1/ Exchange rate: Cr\$12,387 = US\$1.00									

d. State public debt

4.48 The data shown below were provided by the Ministry of Finance of the state of São Paulo.

State of São Paulo public debt as of December 31, 1992 US\$000s 1/					
Type of debt	Current portion	Overdue portion Principal Interest		Total	%
INTERNAL					
Contracts	4,089,098	103,904	75,281	4,268,283	43
Securities	5,098,996			5,098,996	52
Total internal debt	9,188,094	103,904	75,281	9,367,279	95
EXTERNAL					
Contracts	513,190			513,190	5
Totals	9,701,284	103,904	75,281	9,880,469	100
1/ Exchange rate Cr\$12,387 = US\$1.00 (December 31, 1992)					

- 4.49 With respect to the preceding table, according to the State Ministry of Finance, the balances owed to the Federal Economic Fund, for approximately US\$170 million equivalent stemming from transactions completed between September 1991 and December 1992, were renegotiated. The amounts of capital and interest totaling US\$180 million equivalent derive from the debt to the National Bank of Economic and Social Development (BNDES). If the current bill for the rescheduling of overdue debts of the states to the union becomes law, the arrearages will be refinanced over periods of up to 20 years.
- 4.50 In accordance with the instructions of the Central Bank of Brazil, in 1989 the states ceased to pay their external creditors the installments on their loans and were only authorized to pay a portion of the interest thereon, which, in June 1992, became 50% of such interest. The states expect the union to permit the rescheduling of their external debt on the same terms that the federal government arranges with its international creditors.
- 4.51 According to the financial plan submitted for the project, the state of São Paulo will not be a direct and full debtor in respect of the resources received from the Bank (US\$107 million) and from DNER (US\$56 million), but it is responsible for the contribution of US\$62 million for construction on the section under its jurisdiction, which considering the state's economy, should not pose a problem.

e. Fiscal revenue related to the highway sector

- 4.52 Since the adoption of the 1988 Constitution, no link exists in Brazil between the contributions of federal, state or municipal highway users and the funds to be applied in the highway sector. Regardless of their financial treatment, there are resources that

are generated by the users which contribute indirectly with other resources to the financing of the states' activities pertaining to the maintenance and construction of road infrastructure.

- 4.53 The following table summarizes the fiscal revenue from users in the last five years in the state of São Paulo. Tolls provided the state, through DER/SP and DERSA, 13% of total revenue collected in the highway subsector during the period 1988-1992. Revenue from activities allied with the highway sector in the period under consideration surpassed the amount of total investment for construction and maintenance of the state highway network.

State of São Paulo Fiscal resources - Transport sector (In millions of constant US\$)							
	1988	1989	1990	1991	1992	1993(1)	TOTAL
I - IPVA (100%)	65.3	43.1	84.2	266.4	137.6	275.9	616.6
II - ICMS (100%)		812.4	898.4	1,087.9	1,327.3	192.4	4,318.4
Transport sect. (2)		230.3	308.8	225.7	191.5	21.3	977.7
Passengers/persons				41.3	35.6	6.7	83.6
Goods and merch.				144.1	116.1	7.4	267.6
Securities				3.2	3.7	0.6	7.5
Air				8.0	10.6	3.4	22.0
Rail				3.4	17.1	2.4	22.9
Other				25.7	8.4	0.8	34.9
Wholesale trade - fuel (2)(3)		582.1	589.6	862.2	1,135.7	171.1	3,340.8
III - Other taxes and charges	3.2	1.9	0.8	7.8	94.6	11.5	119.8
IV - Tolls	130.0	112.0	131.0	189.0	215.0	0.0	777.0
TOTAL	198.5	969.5	1,114.4	1,571.1	1,774.4	479.9	6,107.9
Note: Data concerning the transport sector for 1989 and 1990 are not available in the PRODESP data bank. (1) January and February 1993; (2) The ICMS was applied to the transport sector and fuel distribution beginning in 1989, in accordance with the 1988 Constitution. (3) The entire ICMS on fuels is collected in the distributorships.							

2. State of Minas Gerais

a. State resources

- 4.54 The following table shows the budgetary execution of resources for the period 1988-1992. Tax revenue, including ICMS receipts, constitute the principal funding source. In the period analyzed, tax collections represented 60% of total revenue, a figure consistent with that for other states of the union. Transfers, particularly current ones, represent an important funding source for the state. In addition, the growth of those transfers and the decrease of capital transfers reflects the fact that state partici-

pation in the distribution of union revenue stopped being characterized as capital transfer and became current transfer instead.

State of Minas Gerais Budgetary execution 1988-1992 (US\$000s) 1/						
CATEGORY	1988	1989	1990	1991	1992*	TOTAL
CURRENT REVENUE	2,791,295	2,916,197	3,532,000	3,415,546	3,210,225	15,865,263
Tax revenue	1,880,790	2,284,922	2,604,117	2,512,993	2,420,040	11,702,863
Taxes	1,871,593	2,277,133	2,599,888	2,506,252	2,409,512	11,664,378
AIRP/ITCD	0	14,930	28,402	24,382	38,075	105,788.7
IPVA	27,591	19,474	19,099	47,608	29,801	143,572.9
ITBI	32,190	974	0	0	0	33,163.25
ICMS	1,811,813	2,241,756	2,552,388	2,434,262	2,341,636	11,381,853
Charges	9,197	7,790	4,229	6,742	10,528	38,485.07
Return on capital	427,661	80,816	108,716	98,823	142,489	858,505.6
Income from real property	0	0	11	38	55	1,039,023
Income from movable property	418,464	61,018	76,805	57,325	82,656	696,268.7
Other income	9,197	19,798	31,899	41,460	59,778	162,132.9
Agricultural income	0	325	309	411	593	1,636,559
Industrial income	4,599	9,088	7,703	9,129	13,162	43,680.49
Income from services	0	1,623	1,794	1,421	2,049	6,887,157
Current transfers	413,866	457,958	730,475	688,688	481,821	2,772,807
Intergovernment transfers	413,866	456,335	722,280	679,719	468,889	2,741,089
Other transfers	0	1,623	8,195	8,969	12,931	31,717.93
Other current income	64,379	81,465	78,886	104,081	150,071	478,882.6
CAPITAL REVENUE	1,834,805	2,025,597	578,818	746,584	1,221,205	6,407,009
Credit transactions	675,981	606,608	348,802	312,259	594,969	2,538,619
Internal	652,988	597,196	300,593	295,079	529,942	2,375,797
External	22,993	9,412	48,209	17,180	65,027	162,821.3
Sales of property	160,948	23,044	7,578	286	412	192,268.2
Transfer of capital	229,925	38,623	31,259	17,196	24,795	341,798.4
Other capital revenue	767,951	1,357,322	191,179	416,842	601,029	3,334,323
OTHER REVENUE	4,626,101	4,941,794	4,110,819	4,162,130	4,431,430	22,272,272
TOTAL EXPENDITURE	4,318,000	4,944,390	4,874,522	4,156,635	4,431,444	22,724,992
SURPLUS (DEFICIT)	308,100	(2,597)	(763,704)	5,494	551	(452,720)
Source: General balance sheets of the state						
1/ Exchange rate: Cr\$12,387 = US\$1.00						
* Provisional data						

b. State expenditure

4.55 As is shown in the following table, the operating costs of the public administration, among which wages are a major item, have maintained a relatively uniform share of total current expenditure. During the period analyzed, total current expenditure accounted for a growing share of total expenditure because, concurrently with major transfers from the union to the states, a larger

participation of the municipalities in state revenues was legally enforced, and this participation was consolidated beginning in 1990.

State of Minas Gerais Budgetary execution 1988-1992 (US\$000s) 1/						
CATEGORY	1988	1989	1990	1991	1992*	TOTAL
CURRENT EXPENDITURES	2,496,991	3,045,698	3,261,400	3,249,646	3,124,961	15,178,696
Operat. expenditures	1,278,386	1,533,884	1,573,222	1,526,927	1,614,022	7,526,440
Personnel	1,016,271	1,266,769	1,337,982	1,191,905	1,209,563	6,022,489
Supplies	50,584	38,623	51,649	46,574	52,582	240,012
Third-party services	197,736	222,650	180,447	276,185	335,718	1,214,736
Misc. operations	13,796	5,842	3,143	10,263	16,159	49,203
Current transfers	1,218,605	1,511,814	1,688,179	1,722,719	1,510,940	7,652,255
Intragov. transfers	165,546	201,229	172,127	167,198	146,644	852,744
Intergov. transfers	441,457	589,731	730,338	753,268	834,263	3,349,056
Other transfers	390,873	574,152	604,261	557,851	284,305	2,411,442
Interest on debt	220,728	146,053	179,121	233,697	236,338	1,015,937
Internal	202,334	94,123	152,560	214,962	209,186	873,165
External	18,394	51,830	26,562	18,735	27,152	142,773
Misc. transfers	0	649	2,332	10,705	9,389	23,075
CAPITAL EXPENDITURES	1,821,010	1,898,693	1,613,122	906,989	1,306,483	7,546,296
Investments	413,866	459,256	301,393	96,529	332,670	1,603,714
Works and facilities	9,197	6,491	1,966	26,547	91,486	1,356,862
Equip. & perman. mat.	27,591	34,728	33,842	27,384	94,373	217,919
Special investments	202,334	225,247	165,680	573	1,975	595,809
Misc. investments	174,743	192,790	99,904	42,026	144,836	654,300
Financial investments	4,599	238,554	9,189	48,594	167,470	486,406
Capital transfers	1,402,545	1,200,883	1,302,539	761,866	806,343	5,474,176
Intragov. transfers	1,016,271	659,187	967,350	209,521	45,836	2,898,164
Intergov. transfers	13,796	13,632	10,046	13,525	2,959	53,958
Oth. capital transfers	0	30,570	18,447	9,650	2,111	33,779
Debt amortization	372,479	522,546	306,685	521,363	753,730	2,476,803
Internal	349,487	391,423	258,853	511,979	737,042	2,248,784
External	22,993	131,123	47,832	9,384	16,687	228,019
Misc. capital transfers	0	1,947	11	7,805	1,708	11,471
GENERAL TOTAL	4,318,000	4,944,390	4,874,522	4,156,635	4,431,444	22,724,992
Source: General balance sheets of the state 1/ Exchange rate: Cr\$12,387 = US\$1.00 * Provisional data						

4.56 With reference to capital expenditure, investment fluctuated according to the availability of internally generated resources and creditworthiness, once the primary needs such as state public debt service and investment in various agencies of the indirect administration had been met.

- 4.57 Budget measures resulted in both surpluses and shortfalls in the period analyzed. To finance the shortfalls, the practice used is to apply the balance payable mechanism, under which outlays committed and not spent in a given year must be paid during the following fiscal year, or otherwise the originally authorized expenditure will have to be canceled.

c. Public debt

- 4.58 According to data from the Public Credit Division of the Ministry of Finance, the state's indebtedness position at November 30, 1992 was as follows:

State of Minas Gerais public debt at November 30, 1992 US\$000s 1/					
Type of debt	Current portion	Overdue portion		Total	%
		Principal	Interest		
INTERNAL	3,997,648	0	0	3,997,648	87
Contracts	1,371,123	0	0	1,371,123	30
Securities	2,617,625	0	0	2,617,625	57
Advances	8,900	0	0	8,900	0
EXTERNAL	301,574	238,715	23,347	593,636	13
Contracts	301,574	238,715	23,347	593,636	13
Totals	4,299,222	238,715	23,347	4,591,284	100
1/ Exchange rate Cr\$9,949.90 = US\$1.00 (November 30, 1992)					

- 4.59 The preceding table shows that the internal debt of the state of Minas Gerais was, on the date referred to, in compliance with its financial obligations. With respect to the external public debt, the state has, since 1989, paid only a portion of the overdue interest; at present that portion is 50% of such interest. The remaining 50% and the principal will be paid only when the federal government reaches an agreement with its external creditors and the states are authorized to resume regular payment of those financial commitments.
- 4.60 The state of Minas Gerais, within the scope of Federal Senate Resolution no.36, of June 1992, has an acceptable degree of creditworthiness, which enables it to apply without restrictions to the Senate of the Union for authorization to negotiate internal or external credits. However, in the case of the operation under study, the Bank's credit will go in its entirety to the Republic, which will be responsible for repaying the debt that is assumed.

d. Minas Gerais State Highway Department (DER/MG)

- 4.61 To analyze DER/MG's expenditures, outlays made during the period 1988-1990 were grouped by program, as is shown in the following table. During the 1988-1990 period priority was given to new road construction, while relatively minor, but growing, funds were directed to highway restoration. The drop in investment, including conservation-related investment, coincides with the change of state government. The pace of spending on the subsector, which among other things includes the State Highways Improvement Program, financed with Bank loans 570/OC-BR and 825/SF-BR, subsequently grew.

DER - Minas Gerais Expenditures by program, 1988-1992 (US\$000s) 1/								
YEAR	CATEGORY	WORKS	EQUIP.	PROJ.	CONSERV.	RESTOR.	CENTRAL ADMIN.	TOTAL
1988	Force acc.	34,351	842	662	55,840	11,142	43,796	146,633
	Manpower	0	0	0	39,653	4,644	12,347	56,644
	Materials	20,401 1/	842	0	0	0	704	21,949
	Other	13,947 2/	0	662	16,187 4/	6,498 4/	30,746	68,040
	CONTRACTS	788,644	0	6,626	22,326	5,638	0	823,234
	Total	822,995	842	7,289	78,165	16,780	43,796	969,867
1989	Force acc.	11,590	249	74	48,442	17,023	41,075	118,452
	Manpower	0	0	0	40,725	13,329	4,124	58,179
	Materials	10,169 1/	249	0	0	0	990	11,407
	Other	1,421 2/	0	74	7,716 4/	3,694 4/	35,961	48,866
	CONTRACTS	474,031	0	2,122	3,158	11,672	0	491,684
	Total	485,621	249	2,196	52,300	28,696	41,075	610,136
1990	Force acc.	17,849	4,807	0	43,912	12,952	32,932	112,451
	Manpower	0	0	0	27,386	8,978	2,759	39,122
	Materials	15,897 1/	4,807	0	0	0	353	21,056
	Other	1,952 2/	0	0	16,526 4/	3,974 4/	29,820	52,272
	CONTRACTS	578,288 3/	0	3,131	13,052	69,186 5/	0	663,657
	Total	596,137	4,807	3,131	56,964	82,137	32,932	776,108
1991	Force acc.	9,197	7,527	0	26,820	7,725	44,722	95,891
	Manpower	0	0	0	20,344	6,898	1,821	29,063
	Materials	7,572 1/	7,527	0	0	0	248	15,346
	Other	1,825 2/	0	0	6,476 4/	827 4/	42,653	51,581
	CONTRACTS	70,181 3/	0	819	2,012	29,931 5/	0	102,843
	Total	79,378	7,527	819	28,832	37,655	44,722	198,934
1992	Force acc.	20,789	2,578	0	21,892	8,922	39,803	93,964
	Manpower	0	0	0	17,994	6,579	1,133	25,706
	Materials	19,311 1/	2,578	0	0	0	334	22,223
	Other	1,478 2/	0	0	3,898 4/	2,343 4/	38,336	46,055
	CONTRACTS	245,871 3/	0	1,965	7,994	82,878 5/	0	338,708
	Total	266,661	2,578	1,965	29,886	91,800	39,803	432,692
GRAND TOTAL		2,250,792	16,003	15,400	246,147	257,068	202,328	2,987,737
Source: General balances of DER/MG								
1/ Materials: represent the amounts paid to Petrobrás (asphalt purchases).								
2/ Others: include transfers to the municipalities, construction of highway terminals.								
3/ Includes projects under IDB II Program - laying and paving.								
4/ Amount included in "Others" because it cannot be disaggregated by costs.								
5/ Includes Program IDB II - restoration.								

4.62 With respect to the financing of DER/MG operations, the scant internal resources generated by this agency flow from the monthly charge for inspecting intermunicipal public transport, which generates relatively very small sums. In consequence, resources from the Department of Revenue of the state of São Paulo, either

from the treasury itself or through it, constitute the basic means of funding DER/MG transactions.

e. Fiscal revenue pertaining to the highway sector

- 4.63 The contributions of users of the highway subsector in the state of Minas Gerais, as in the other states of the union, are not constitutionally tied to any specific purpose and form part of the general revenue which the Department of Revenue of the state of São Paulo receives from that and other sources. The following table is designed to illustrate the relative importance of the taxes and charges generated by the subsector in the period 1989-1992.

State of Minas Gerais - Revenues generated by the highway sector US\$000s						
Description	1989	1990	1991	1992	Total	%
IPVA	19,474	19,099	47,608	29,801	115,982	10
ICMS	179,347	317,070	309,418	311,487	1,117,322	90
Fuel	96,848	216,777	219,299	209,325	742,249	60
Transport	82,499	100,293	90,119	102,162	375,073	30
Totals	198,821	336,169	357,026	341,288	1,233,304	100

- 4.64 According to the State Ministry of Finance, economic activities pertaining to the state of Minas Gerais's highway sector brought the treasury US\$1,233,300,000 equivalent in the last four years. Those funds, collected from the various users of the sector's infrastructure, were equivalent to two-thirds of DER/MG's outlays on state highway maintenance and construction over the same period, which is a satisfactory performance.

3. National Highway Department (DNER)

- 4.65 The following table, which shows expenditure by program for the period 1988-1992, brings out the shift in emphasis from investment in maintenance to highway construction.

NATIONAL HIGHWAY DEPARTMENT - DNER Expenditure by programs, 1988-1992 (US\$000s) 1/								
YEAR	CATEGORY	WORKS	EQUIP.	PROJ.	CONSERV.	RESTOR.	CENTRAL ADM.	TOTAL
1988	Force acc.	0	5,123	0	0	0	804,495	809,618
	Manpower	0	0	0	0	0	166,728	166,728
	Materials	0	5,123	0	0	0	25,338	30,461
	Other	0	0	0	0	0	612,430	612,430
	CONTRACTS	490,311	0	4,603	148,173	482,600	0	1,125,688
	Total	490,311	5,123	4,603	148,173	482,600	804,495	1,939,306
1989	Force acc.	0	255	0	0	0	1,033,531	1,033,786
	Manpower	0	0	0	0	0	308,435	308,435
	Materials	0	255	0	0	0	13,089	13,345
	Other	0	0	0	0	0	711,007	711,007
	CONTRACTS	625,054	0	2,061	51,140	427,252	0	1,105,507
	Total	625,054	255	2,061	51,140	427,252	1,033,531	2,139,295
1990	Force acc.	0	34	0	0	0	605,246	605,279
	Manpower	0	0	0	0	0	207,904	287,904
	Materials	0	34	0	0	0	8,571	8,605
	Other	0	0	0	0	0	388,771	388,771
	CONTRACTS	56,639	0	763	29,184	266,375	0	352,961
	Total	56,639	34	763	29,184	266,375	605,246	958,240
1991	Force acc.	0	1,184	0	0	0	474,570	475,754
	Manpower	0	0	0	0	0	81,315	81,315
	Materials	0	1,184	0	0	0	2,892	4,176
	Other	0	0	0	0	0	390,262	390,262
	CONTRACTS	174,689	0	12,367	68,427	340,132	0	595,624
	Total	174,689	1,184	12,367	68,427	340,132	474,570	1,071,378
1992	Force acc.	0	1,362	0	0	0	406,252	407,614
	Manpower	0	0	0	0	0	61,894	61,894
	Materials	0	1,362	0	0	0	3,300	4,663
	Other	0	0	0	0	0	340,858	340,858
	CONTRACTS	143,919	0	3,298	69,343	328,124	0	544,684
	Total	143,919	1,362	3,298	69,343	328,124	406,252	952,298
	GENERAL TOTAL	1,490,612	7,958	23,722	366,267	1,844,483	3,324,094	7,057,136
Fuente: General balances of DER/MG								
1/ Exchange rate: CR\$12,387 = US\$1.00								

4.66 The preceding table shows that 47% of outlays were applied to projects for highway construction and restoration and only 5% went into routine highway conservation. This situation will change significantly as a result of DNER's changed role. For purposes of financing DNER's operations for the period in question, funding sources historically included the so-called National Highway Fund, which was fed with resources derived from the highway charge, the highway transport charge on passengers and freight, and the tax on

liquid and gaseous fuels. The decision to merge that fund progressively with the national development fund led to a gradual financing of the sector. Subsequently, in 1986, the first of those contributions was replaced by the tax on motor vehicle ownership, which became a tax shared exclusively by states and municipalities. Following the tax reform sanctioned by the 1988 constitution, the two other taxes were incorporated into the base of the ICMS, whose proceeds are also shared by states and municipalities only. That transfer of traditionally federal funds accentuated the def financing of the highway sector.

- 4.67 DNER's funding derives mainly from budget transfers effected through the Ministry of Transport. This source was recently enhanced by the decision of the national authorities to reverse the deterioration of the highway infrastructure through policy and institutional changes and the introduction of financial mechanisms suited to that goal. A petroleum import tax with an ad valorem rate of 19% which went into effect towards the end of 1991 and was increased to 38% in January 1993 is expected to raise not less than US\$60 million equivalent per month. The federal government has agreed to channel those resources primarily to financing the DNER budget, with priority placed on rehabilitation of the highway network, in conjunction with the structural institutional changes just referred to.

V. PROJECT FEASIBILITY

A. Technical feasibility

- 5.1 The project to enlarge and modernize the Fernão Dias highway (BR-381) complies with the Government of Brazil's basic policy objective for the highway sector, which is to rehabilitate and maintain the existing highway network by improving its level of operation in order to raise user safety levels and to reduce vehicle operation costs. In addition, by constructing toll facilities the project meets the further objective of setting up a permanent financing system for the rehabilitation and maintenance of federal highways.
- 5.2 Sound final engineering designs are reflected in reasonable construction costs, including contingencies and allowances for price escalation.
- 5.3 DNER, which will execute the project through a specific delegation agreement with the Minas Gerais and São Paulo State Highway Departments (DER/MG and DER/SP), has extensive experience in the execution of highway projects partially financed by the Bank. This experience has been gained executing seven important projects since the 1960s. DER/MG has also given proof of its ability in the execution of two highway projects partially financed by the Bank. Although DER/SP has not yet executed projects funded by the Bank, the organization has an excellent reputation and has executed projects funded by the World Bank.
- 5.4 The expectation is that works constructed under the project will be satisfactorily maintained through contracts awarded to private contractors in accordance with DNER policy.

B. Economic feasibility

- 5.5 The investments will mainly permit vehicles to travel at higher average speed and to be operated at lower cost, and accidents will be substantially reduced on many segments. The projected improvements will allow diversion to the projected highway of a substantial amount of traffic now using longer routes to avoid the danger and congestion existing on many sections of Fernão Dias. This diverted traffic consists chiefly of long-distance transport vehicles traveling to points north or south in the country, which currently use the congested corridor through the state of Rio de Janeiro (route BR-116). Improvement of the surface along existing sections will also pay sizable dividends, considering the current high volumes of traffic.
- 5.6 These savings from the upgrading of the Fernão Dias highway will produce the most benefits, which have been evaluated through the

methodology adopted in the Bank. This methodology is based on the social surpluses approach. To establish the project's economic feasibility (first stage) and determine its optimum size, a separate socioeconomic analysis was conducted for fifteen homogeneous sections in which the construction costs, the projected traffic and other benefits are substantially different. Those analyses were conducted based on manual counts of vehicular flow and origin-and-destination surveys done at 46 different locations of the neighboring road system. In addition, innumerable manual counts were taken at existing intersections to optimize the size of the access ways. Speeds were recorded over an entire day in order to obtain the values of this variable correlated with the different types of vehicle using the highway, and the results were fed into the economic appraisal of the project.

- 5.7 The project's impact on vehicle speed was assessed using the methodology recommended in the *Highway Capacity Manual* of the Transportation Research Board. On the basis of these data and measurements of the roughness of the various sections of the existing highway, the equations of the *Highway Design and Maintenance Standards Model* (HDM-3) were used to evaluate the economic vehicle operating costs in situations with and without the project. The costs include investment (initial investment and the costs of resurfacing which will be necessary at the end of a useful life of 10 years) and the annual costs of routine and periodic maintenance.
- 5.8 A comparative analysis of technical alternatives concerning the type of pavement and the routing (especially the Betim and Itaguara bypasses) was also conducted in order to ensure that the best alternatives are adopted. As a result of this analysis it was concluded that the present routing is the best alternative for the project. The analyses indicate that the economic internal rates of return (EIRRs) of the individual sections vary between 23% and 159%, with a profitability of 35% for the total project; these are shown in the following table. The best-time optimization analysis indicates that the investment should be made as soon as possible. The sensitivity analysis shows that the risk of the project's not being profitable is low.

Table A-4 Results of the economic assessment of the project (first stage)		
Section	EIRR %	Net Present value (NPV) (Millions of Cr\$)
km 420 - km 432	159	203,682
km 432 - km 441	30	82,966
km 441 - km 455	30	54,038
km 455 - km 509	23	143,729
km 509 - km 535	24	63,500
km 535 - km 560	38	140,093
km 560 - km 584	35	122,309
km 584 - km 604	35	89,536
km 604 - km 626	30	92,638
km 626 - km 637	28	49,686
km 37 - km 53	31	134,307
km 53 - km 68	54	303,187
km 68 - km 79	24	137,795
km 79 - km 86	30	113,014
km 86 - km 90	52	429,592
TOTAL	35	2,160,072

C. Distributive impact

- 5.9 The distributive impact was measured using the Bank's methodology, calculating the proportion of benefits accruing to the low-income group within the total benefits accruing to the private sector as a whole. The distribution of benefits and costs of the project among the various groups is indicated below:

Economic Net Present Value of Benefits by beneficiary group (in millions of Cr\$)				
	Private sector		Public sector	Economic NVP
	Low income	Others		
Costs				
Investment	+ 31,335	0	- 814,703	- 783,368
Maintenance	+ 550	0	- 14,299	- 13,749
Benefits				
Light veh.	0	+ 881,384	- 176,277	+ 705,107
Buses	+ 39,646	+ 52,350	- 18,399	+ 73,596
Trucks	+ 182,079	+ 1,134,954	- 263,407	+ 1,053,626
Diverted tr.	+ 56,770	+ 353,865	- 82,127	+ 328,508
Time	+ 10,790	+ 528,717	0	+ 539,507
Accidents	+ 33,103	+ 287,952	- 64,211	+ 256,844
Tolls	0	- 31,000	+ 31,000	0
TOTAL	+ 354,272	+ 3,208,222	- 1,402,423	+ 2,160,071

5.10 The resulting distributive impact coefficient is 10% 6/.

5.11 This result does not totally reflect the fact that the project will benefit the entire population in the highway's direct impact area, permitting faster access to the urban centers where the schools, hospitals, etc. are located, encouraging investment in these areas, reducing transport costs and serious accidents on the Fernão Dias highway. These benefits will contribute to the development and well-being of all the inhabitants of the project's impact area, more than half of whom are in the low-income group.

D. Financial feasibility

5.12 The project's financial feasibility was examined in terms of whether the executing agency, DNER, and the states of Minas Gerais and São Paulo could generate the counterpart funds necessary for project implementation, since, under the financial plan adopted for the proposed operation, debt service on the proposed Bank loan will be the exclusive responsibility of the federal government.

$$\text{6/ Coefficient} = \frac{354,272}{354,272 + 3,208,222} = 0.10$$

1. DNER financial projections

5.13 These projections, prepared for the period 1993-1997, are shown in the following table.

National Highway Department - DNER Projected resources and expenditure, 1993-1997 (US\$000s) 1/						
Category	1993	1994	1995	1996	1997	TOTAL
RESOURCES	1,829,079	1,696,266	1,696,928	1,519,127	1,276,300	8,017,700
IDB project transfers	0	123,582	150,506	198,915	60,997	534,000
IDB loan	0	54,268	80,099	105,932	26,701	267,000
National Treasury	0	24,547	35,976	50,160	22,817	133,500
State of Minas Gerais	0	19,506	20,920	25,879	6,975	73,280
State of São Paulo	0	25,261	13,511	16,944	4,504	60,220
Other transfers	1,829,079	1,572,684	1,546,422	1,320,212	1,215,303	7,483,700
EXPENDITURES	1,829,079	1,696,266	1,696,928	1,519,127	1,276,300	8,017,700
Current	318,313	244,263	238,693	230,345	219,610	1,251,222
Personnel/benefits	62,000	62,620	63,246	63,879	64,517	316,262
Other curr. transf.	256,313	181,643	175,447	166,464	155,093	934,960
Capital	1,510,766	1,452,003	1,458,235	1,288,784	1,056,690	6,766,478
Investments	1,419,361	1,242,500	1,236,000	1,026,000	926,000	5,849,861
Construction	449,789	350,000	350,000	350,000	350,000	1,849,789
Restoration	730,561	500,000	500,000	30,000	200,000	2,230,561
Conservation	148,792	152,500	150,000	140,000	140,000	731,292
Rehabilitation	0	90,000	90,000	90,000	90,000	360,000
Others	90,219	150,000	146,000	146,000	146,000	678,219
IDB project under study	0	123,582	150,506	198,915	60,997	534,000
Transfers	91,405	85,921	71,729	63,869	69,693	382,617

1/ Exchange rate: Cr\$12,387 = US\$1.00

5.14 As indicated in chapters III and IV, DNER is a federal agency for which transfers from the Treasury of the Union are the chief source of funds. According to the historical financial analysis contained in chapter IV, the authorities want future DNER budgets to reach the levels required to implement the new policies of the subsector, whose main emphasis is on rehabilitating the federal highway infrastructure. Therefore, after the year 1993, which reflects the values of the budget for that year, the necessary resources were determined to finance the current expenditure and capital spending resulting from those new guidelines, which are detailed below.

5.15 The investment estimates are based on the multiannual plan (1993-1995) and the target plan (1992-2001), which are discussed in

detail in Chapter I (paragraphs 1.8, 1.9 and 1.10). The multianual plan was used in preparing the DNER budget forecast until 1995, because it contained the financial and physical goals for the subsector approved by the National Congress in 1992. The target plan, which is the only long-term study in existence for the federal highway sector, was used for the remaining years. The Fernão Dias highway modernization project is incorporated in the projections in accordance with its financial implementation schedule.

2. Financial projections of the state of Minas Gerais

- 5.16 The projections were prepared using an estimate of the principal fiscal revenues and of the magnitude of the various items of current and capital expenditures, based on expectations of growth by the state economy. These forecasts, and those prepared for the other financiers of the project, may be affected by the climate of economic instability in Brazil and by possible structural changes and adjustments at the national level affecting, to differing degrees, the economies of the various states. In any case, a reasonable expectation prevails that the working hypotheses employed for the period 1993-2002 will materialize. The following table shows the resource and expenditure projections of the state of Minas Gerais.
- 5.17 Approximately half of the total resources to be raised by the Department of Revenue of the state of São Paulo will come from the tax revenue generated by the ICMS, growth of which is conservatively estimated at 2% annually over the entire period under consideration. This result is based on the expectations of the Ministry of Planning for the gross state product, viz. 1.5%, 2.2% and 3% for 1994, 1995 and 1996, respectively, while from 1997 on the rates are expected to fluctuate between 3.8% and 5% annually.
- 5.18 If the Ministry's forecast is realized, an additional rise in revenue will occur that is not reflected in the financial projection. There will also be a rise in the state's investment capacity, which is normally limited by the rigidity of the operating costs, the priority given to servicing the public debt, and, more generally, the current instability of the national and state economies. Nevertheless, the state will devote resources to investment in excess of recent historical figures, 9.4% versus 7%, to accommodate the project under study.

STATE OF MINAS GERAIS
Projection of resources and expenditures, 1993-2002
(US\$000s) 1/

P R O J E C T E D

	Real 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	2,420,950	2,497,138	2,547,081	2,598,022	2,649,983	2,702,983	2,757,042	2,812,183	2,868,427	2,925,795	2,984,310
	2,341,035	2,388,774	2,436,549	2,485,280	2,534,986	2,585,685	2,637,399	2,690,147	2,743,950	2,798,829	2,854,860
	29,805	66,759	68,094	69,456	70,845	72,262	73,707	75,182	76,685	78,219	79,740
	48,610	41,605	42,437	43,286	44,152	45,035	45,936	46,854	47,791	48,747	49,720
	947,652	755,832	770,949	786,367	802,095	818,137	834,499	851,189	868,213	885,578	903,240
fers	468,948	1,077,414	1,109,736	1,143,029	1,177,319	1,212,639	1,249,018	1,286,489	1,325,083	1,364,836	1,405,700
	163,250	193,935	199,753	205,745	211,917	218,275	224,823	231,568	238,515	245,670	253,040
	72,141	107,741	110,974	114,303	117,732	121,264	124,902	128,649	132,508	136,484	140,510
ary	32,170	32,322	33,292	34,291	35,320	36,379	37,471	38,595	39,752	40,945	42,170
cs	127,436	129,290	133,168	137,163	141,278	145,517	149,882	154,379	159,010	163,780	168,680
	73,951	614,126	632,550	651,526	671,072	691,204	711,940	733,299	755,297	777,956	801,240
	0	0	32,603	48,122	63,643	16,042	0	0	0	0	0
	0	0	14,323	20,992	29,268	13,314	0	0	0	0	0
	73,951	614,126	585,624	582,412	578,161	661,848	711,940	733,299	755,297	777,956	801,240
	595,044	753,835	642,355	615,460	430,523	693,200	505,372	391,495	402,394	239,650	540,860
	530,009	548,766	446,127	457,266	272,329	614,654	466,937	391,495	402,394	239,650	540,860
	65,035	205,069	196,228	158,194	158,194	78,546	38,435				
as	4,431,994	5,084,219	5,070,121	5,142,878	5,059,920	5,426,958	5,345,932	5,341,356	5,464,117	5,415,859	5,834,210
	2,888,623	2,903,186	2,961,250	3,020,475	3,080,884	3,142,502	3,205,352	3,269,459	3,334,848	3,401,545	3,469,510
ts	2,132,426	2,027,478	2,068,027	2,109,388	2,151,575	2,194,607	2,238,499	2,283,269	2,328,934	2,375,513	2,423,020
osts	1,727,947	1,778,783	1,814,359	1,850,646	1,887,659	1,925,412	1,963,920	2,003,199	2,043,263	2,084,128	2,125,810
	404,479	248,694	253,668	258,741	263,916	269,195	274,579	280,070	285,672	291,385	297,210
	756,197	875,709	893,223	911,087	929,309	947,895	966,853	986,190	1,005,914	1,026,032	1,046,550
	687,438	684,147	697,830	711,787	726,023	740,543	755,354	770,461	785,870	801,588	817,630
	68,759	191,561	195,392	199,300	203,286	207,352	211,499	215,729	220,044	224,445	228,930
	1,542,821	2,181,033	2,110,172	2,119,940	1,981,708	2,282,038	2,144,272	2,073,162	2,126,593	2,015,755	2,363,160
	500,140	522,944	492,014	465,617	505,129	457,032	465,262	478,326	505,682	544,912	571,940
bj.	0	0	66,432	90,034	118,790	36,331					
	500,140	522,944	425,582	375,583	386,339	420,701	465,262	478,326	505,682	544,912	571,940
	990,068	797,584	807,247	890,613	642,715	1,075,377	909,729	806,484	791,486	572,746	851,630
	753,730	583,738	572,263	645,973	431,431	827,370	697,574	622,046	623,233	438,952	700,630
ats	236,338	213,846	234,984	244,640	211,284	248,007	212,155	184,438	168,253	133,794	150,970
end.	52,613	860,505	810,912	763,710	833,864	749,629	769,282	788,352	829,425	898,096	939,620
TURE	4,431,444	5,084,219	5,071,422	5,140,415	5,062,593	5,424,540	5,349,624	5,342,622	5,461,442	5,417,300	5,832,760
cit)	550	0	-1,302	2,464	-2,673	2,418	-3,693	-1,265	2,676	-1,442	1,510
	550	0	-1,302	1,162	-1,511	907	-2,785	-4,050	-1,375	-2,816	-1,300

1/ Exchange rate: Cr\$12,387 = US\$1.00

- 5.19 With respect to the factors conditioning investment, current expenditure and debt service, it is the intention of the state authorities to restore the purchasing power of wages at least partially and to allocate to debt service 15% of total projected resources, a share similar to previous years. In order not to put pressure on the state's cash flow, the personnel and social benefits entry will be held within the limit of 65% of net fiscal revenue. Long-term debt service includes the effect of reprogramming the state's external debt, according to the probable financial conditions to be agreed upon concerning any transfers from the union to the states.
- 5.20 The financial projection shows, for several years, possible negative balances which, cumulative to the year 2002, will amount to US\$1.3 million equivalent. If those deficits actually materialize, they can be financed through the balance payable mechanism previously described and provided for in budgetary law, or through short-term loans from banking institutions known as "advance on revenue," which are routinely and frequently negotiated by the state of Minas Gerais.

3. Minas Gerais State Highway Department (DER/MG)

- 5.21 The DER/MG resources and expenditure forecast for 1993-1997 is shown in the following table. The total amount of resources to finance the agency's basic activities will be kept within the levels reached in recent experience in accordance with the original sources, i.e., they will come from current and capital transfers from the Department of Revenue of the state of São Paulo. The most noteworthy item in regard to DER/MG financing is the transfer of resources from the Bank loan and DNER for the execution of the proposed program, to which the funds from the Department of Revenue of the state of São Paulo itself will be added.
- 5.22 Current expenditure will diminish slightly as the effect of trimming DER/MG, as described in chapter IV, sets in. The most significant capital outlays will be for activities grouped under the heading of works and facilities and for disbursements under the proposed project's investment schedule. With respect to the former, investment in laying and paving will remain constant, around 250 km/year, at a projected cost of US\$320,000/km.

Minas Gerais State Highway Department - DER/MG Projected resources and expenditures 1993-1997 (US\$000s)1/					
Category	1993	1994	1995	1996	1997
CURRENT RESOURCES	52,955	53,487	53,878	54,209	54,732
Internally generated rev.	1,421	1,456	1,493	1,530	1,568
Transf. and other cur. res.	51,535	52,031	52,385	52,679	53,163
CAPITAL RESOURCES	305,697	377,760	399,840	375,653	293,774
Internal credit trans.	0	0	0	0	0
Transf. and other cap. res.	305,697	311,328	309,806	256,863	257,443
Transfer of agreements	0	66,432	90,034	118,790	36,331
IDB BR 381 São Paulo Rev. Dept.	0	19,506	20,920	25,879	6,975
IDB OC BR 381	0	32,603	48,122	63,643	16,042
DNER BR 381	0	14,323	20,992	29,268	13,314
Total resources	358,652	431,248	453,718	429,862	348,506
CURRENT EXPENDITURES	52,955	53,487	53,878	54,209	54,732
Personnel and benefits	24,356	24,595	24,836	24,953	25,197
Supplies	243	243	243	243	243
Third party and oth. Op. exp.	3,711	3,785	3,841	3,938	3,997
Transf. and other cur. exp.	24,102	24,343	24,587	24,956	25,205
Interest on the internal debt	509	500	360	113	87
Interest on the external debt	35	22	11	7	3
CAPITAL EXPENDITURES	305,697	377,760	399,840	375,653	293,774
Works and facilities	297,710	300,194	300,285	249,376	249,468
Laying and paving (1)	80,000	80,000	80,000	80,000	80,000
Restor. (period. cons.) (2)	174,050	174,050	174,050	123,050	123,050
Routine Conservation (3)	34,705	37,100	37,100	37,100	37,100
Other works (4)	8,955	9,044	9,135	9,226	9,318
IDB BR 381 São Paulo Rev. Dept.	0	19,506	20,920	25,879	6,975
IDB OC BR 381	0	32,603	48,122	63,463	16,042
DNER BR 381	0	14,323	20,992	29,268	13,314
Miscellaneous investments	0	0	0	0	0
Perman. equip. and mat.	2,284	5,435	4,860	5,020	5,525
Transfers and other cap. exp.	1,266	1,266	1,266	1,266	1,266
Amort. of internal debt	2,858	2,728	2,854	832	606
Amort. of external debt	1,579	1,705	541	549	577
Total expenditures	358,652	431,248	453,718	429,862	348,506
BALANCE	0	0	0	0	0
Source: Minas Gerais State Highway Department (1) Includes projects (2) Includes only expenditure with contracts (on-staff personnel is under personnel and social benefits) (3) Includes third-party services expenditures (4) Includes transfers to municipalities, urban road systems, highway terminals, elimination of dangerous segments, among other investments.					

5.23 Periodic restoration and conservation includes recapping, actual restoration, application of the asphalt layer and primary road resurfacing. The needs were estimated at 2,000 km for 1993 and

4,000 km/year for the remaining years. The differences in total annual cost are explained by the different composition of the activities, in terms both of lengths covered annually and of unit costs. With respect to routine maintenance, the annual lengths planned are approximately 24,800 km in the year 1993 and 26,500 in the rest of the period, with an estimated average cost of US\$1,400/km. This does not include the cost of manpower, which is included under the heading of personnel and social benefits.

4. Financial projections of the state of São Paulo

- 5.24 Projections of state fiscal revenue and expenditure for the next ten years, 1993 to 2002, are shown in the next table. Tax revenue will register a slight growth driven by the positive change foreseen for the state's gross domestic product. That growth will achieve a rate of 0.25% per year beginning in 1993 and 2% by the end of the decade, for an average over the period of approximately 1.2%, which is acceptable given the state's economic potential.
- 5.25 Other fiscal revenue and federal transfers are estimated to have grown at lower rates than tax revenue, since they are driven primarily by factors exogenous to the state's own economic activity. Meanwhile, the size of public expenditure will be defined in conjunction with revenue actually collected. Since personnel costs are conditioned by the behavior of tax revenue, gradual growth in this area is expected. That entails a slight rebound from the decline in wages through monetary devaluation, and an increase, albeit small, in the staff size of the Force account in order to meet the growing demand for public services, especially for low-income users, where the greatest shortcomings are evident.
- 5.26 The other operating expenses will grow more slowly than revenue, thanks to improved productivity resulting from spending cuts, especially in routine activities. The ensuing current saving, as well as increased credit transactions, will finance the investment which will consequently more closely reflect the expected levels of fiscal revenue. Intergovernment transfers will remain near recent historical levels.

GOVERNMENT OF THE STATE OF SAO PAULO
PROJECTION OF REVENUE AND EXPENDITURE
IN THOUSAND OF US\$/BASE DEC. 1992

CATEGORY	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
REVENUE	15,960,750	16,041,075	16,138,161	16,276,529	16,307,633	16,584,737	16,836,657	17,135,103	17,482,332	17,836,711
TAX REVENUE	11,126,865	11,156,688	11,212,471	11,296,564	11,409,530	11,552,150	11,725,431	11,930,627	12,169,238	12,412,62
ICMS	10,462,764	10,488,921	10,541,365	10,620,425	10,726,630	10,860,713	11,023,623	11,216,537	11,440,867	11,669,68
OTHERS	666,101	667,767	671,106	676,139	682,900	691,437	701,806	714,090	728,371	742,93
OTHER REVENUE	1,008,905	1,129,851	1,150,009	1,172,607	1,138,020	1,128,477	1,141,342	1,156,522	1,174,101	1,191,94
AGREEMENTS(+)	0	31,869	46,961	63,181	20,162	0	0	0	0	0
BR 381/DB/OC	0	21,665	31,977	42,289	10,659	0	0	0	0	0
BR 381/DNER	0	10,224	14,984	20,892	9,503	0	0	0	0	0
OTHERS	1,008,905	1,097,962	1,103,138	1,109,426	1,117,858	1,128,477	1,141,342	1,156,522	1,174,101	1,191,94
FEDERAL TRANSFERS	923,899	925,632	929,149	934,444	941,547	950,490	961,327	974,112	988,919	1,003,94
FPE	42,422	42,501	42,663	42,906	43,232	43,643	44,140	44,727	45,407	46,09
IRRF	315,753	316,345	317,547	319,357	321,784	324,841	328,544	332,914	337,974	343,11
EXPORT FUND	164,635	164,944	165,571	166,514	167,780	169,374	171,305	173,583	176,222	178,90
EDUCATION WAGES	230,646	231,079	231,957	233,279	235,052	237,285	239,990	243,182	246,878	250,63
OTHER FEDERAL TRANSACTIONS	170,443	170,763	171,411	172,388	173,699	175,347	177,348	179,706	182,438	185,21
CREDIT TRANSACTIONS	2,820,090	2,828,904	2,846,442	2,872,914	2,908,536	2,953,620	3,008,557	3,073,842	3,150,074	3,228,19
INTERNAL	2,711,234	2,719,708	2,736,569	2,762,019	2,796,266	2,839,610	2,892,427	2,955,192	3,028,481	3,103,58
EXTERNAL	108,856	109,196	109,873	110,895	112,270	114,010	116,130	118,650	121,593	124,60
EXPENDITURE	15,960,750	16,026,002	16,129,844	16,292,753	16,402,137	16,584,737	16,836,658	17,135,102	17,484,336	17,836,72
CURRENT EXPENDITURE	7,864,303	7,881,536	7,987,275	7,988,617	7,997,136	8,065,226	8,192,121	8,318,510	8,465,226	8,614,57
PERSONNEL AND BENEFITS	3,980,532	3,990,483	4,010,436	4,040,514	4,039,180	4,089,670	4,151,015	4,223,657	4,308,131	4,394,29
OTHER COSTS	2,075,483	2,079,375	2,087,276	2,099,174	2,115,128	2,135,221	2,159,563	2,188,285	2,221,547	2,255,31
INTRAGOVERN. TRANSFERS	1,808,288	1,811,678	1,889,563	1,826,929	1,842,828	1,860,335	1,881,543	1,906,568	1,935,548	1,964,96
CAPITAL EXPENDITURE	2,747,120	2,773,082	2,802,142	2,875,398	2,853,611	2,870,625	2,921,383	2,981,655	3,051,970	3,123,95
DIRECT. ADM. INVESTMENT	693,129	694,861	694,336	703,573	710,609	719,492	730,284	743,064	757,925	773,08
FINANCIAL INVESTMENT	3,158	3,166	3,182	3,206	3,238	3,278	3,328	3,386	3,454	3,52
OTHER CAPITAL INVESTMENTS	9,111	9,134	9,180	9,249	9,341	9,458	9,600	9,768	9,963	10,16
INTRAGOVERN. TRANSFERS	2,041,722	2,008,771	2,034,972	2,079,245	2,105,757	2,138,397	2,178,171	2,225,437	2,280,628	2,337,18
INVESTMENT - AGREEMENTS (*)	0	57,150	60,472	80,125	24,666	0	0	0	0	0
BR 381/DB/OC	0	21,665	31,977	42,289	10,659	0	0	0	0	0
BR/381/DNER	0	10,224	14,984	20,892	9,503	0	0	0	0	0
BR/381/COUNTERPART	0	25,261	13,511	16,944	4,504	0	0	0	0	0
DEBT SERVICE	2,268,926	2,276,250	2,227,808	2,312,774	2,384,066	2,421,971	2,468,135	2,522,955	2,588,919	2,652,39
INTERNAL	2,175,356	2,182,378	2,133,336	2,217,396	2,285,748	2,322,090	2,366,349	2,418,909	2,480,233	2,543,01
PRINCIPAL	751,803	780,855	827,360	855,915	853,041	870,784	894,007	913,864	937,032	960,75
INTEREST AND COMMISSIONS	1,423,553	1,401,523	1,305,976	1,361,481	1,432,707	1,451,306	1,472,342	1,505,045	1,543,201	1,582,26
EXTERNAL	93,570	93,872	94,472	95,378	96,318	99,681	101,786	104,046	108,686	109,38
PRINCIPAL	42,219	29,448	21,889	21,422	29,859	26,388	26,403	31,089	38,648	37,57
INTEREST AND COMMISSIONS	51,351	64,424	72,583	73,956	66,459	73,493	75,383	72,957	70,038	71,81
TRANSFER TO MUNICIPI.	3,089,410	3,097,134	3,112,619	3,135,964	3,167,324	3,206,915	3,255,019	3,311,982	3,378,221	3,445,78
ANNUAL SURPLUS (DEFICIT)	0	0	13,073	8,317	(16,224)	(4,504)	0	(1)	1	(2,00
CUMULATIVE SURPLUS (DEFICIT)		0	13,073	21,390	5,166	662	662	661	662	(1,34

SOURCES:

1993: STATE BUDGET

1994/2002: PROJECTION

NOTE: DATA SUBJECT TO CHANGE

(+): DATA MAY BE CHANGED TO REFLECT ADJUSTMENTS IN THE INVESTMENT SCHEDULE.

- 5.27 Stated data from the Coordenadoria de Crédito e Patrimônio [Credit and Assets Coordinating Office] of the Ministry of Finance concerning the make-up of the public debt reflect the rescheduling of the overdue internal public debt to the federal government and the overdue external debt to private banks. Although the negative balances that will occur during the period in which the project is executed are relatively large, they can be absorbed through the use of accumulated cash balances.

5. São Paulo State Highway Department (DER/SP)

- 5.28 The financial results forecast for the department over the execution period of the proposed project are shown in the following table:

SÃO PAULO STATE HIGHWAY DEPARTMENT (DER/SP) (US\$000s)		
Budget item	Totals 1993-1997	%
Resources		
Current	1,209,700	36
Tolls	300,710	9
Others	908,990	27
Capital	2,149,444	64
Project under study	247,595	7
Others	1,901,849	57
Total resources	3,359,144	100
Expenditures		
Current	1,209,700	36
Capital	2,149,444	64
Project under study	247,595	7
Others	1,901,849	57
Total expenditures	3,359,144	100

- 5.29 According to the budget forecast, DER/SP will raise approximately US\$3.5 billion in resources during the project's construction period, including \$300 million in tolls. In this connection the revenue projections include eight new toll plazas in addition to those already in operation. These are to be built in the next five years even though it has been conservatively estimated that collections will remain flat because the larger traffic volumes will offset any devaluations of the local currency in relation to the foreign currency.

- 5.30 Also shown is the inflow of funds - transferred by DNER (Department of National Revenue and the IDB) and contributed by the Department of Revenue of the state of São Paulo - for the financing of the project under study. For their part, the forecast investment includes the application of those resources to the work pertaining to the segment of BR-381 located inside the jurisdiction of the state of São Paulo.

6. Feasibility of local input

- 5.31 Execution of the proposed project will require resources totaling US\$534 million equivalent, to be disbursed between 1994 and 1997. In addition to funds from the Bank loan, estimated at US\$267 million, US\$133.5 million will be needed from the Treasury of the Union, US\$73.3 million from the state of Minas Gerais, and US\$60.2 million from the state of São Paulo.
- 5.32 Federal resources are expected to be available in good time, on the basis of two key decisions by the national authorities. The first is to give DNER sufficient resources to rehabilitate the highway infrastructure and subsequently to maintain it at an operationally adequate level. Under the second, the authorities will propose to congress, in good time, the establishment of a permanent financing system for that purpose. Although this cannot be enshrined in law under the current federal constitution, a 38% ad hoc tax has been created on petroleum imports, the receipts of which are funneled to the highway subsector. The tax produces an amount of approximately US\$750 million, or 50% of DNER's total budget in the project execution period. Further, as one of the incentives to be offered to private initiative, sections of the federal network are being offered under a concession arrangement tied in with the toll and other mechanisms, 1/ which will make it possible to raise additional moneys for a Highway Fund or the equivalent, also under consideration by the national authorities. The availability of resources to be contributed by the union is thought to be adequately ensured by those actions.
- 5.33 With respect to the state of Minas Gerais, the financial projections provide an adequate frame of reference to evaluate the state's ability to generate funds and fulfill its financial obligations, which include pledged contributions to the proposed project. In that context, adequate financial capacity is provided to meet the investment requirements outlined in the government's multiannual plans, which give priority to the proposed project.

1/ A clause is recommended for inclusion in the proposed loan contract whereby the borrower undertakes to implement the toll mechanism on the BR-381 F. Dias highway, with the additional provision that the rates to be applied must produce sufficient revenue to cover the annual cost of its maintenance and operation (see paragraphs 3.30, 3.31, and 3.32).

- 5.34 Considering the potential strength of its economy, the state of São Paulo is expected to generate annual tax revenue estimated at US\$11 billion equivalent, in the light of which the treasury's contributions to the financing of the project appear feasible.

E. Institutional capacity

- 5.35 DNER will have responsibility for executing the proposed project. Under the signed agreement, that agency will delegate to the highway departments of Minas Gerais and São Paulo the works and services to be carried out within their respective state jurisdictions. DNER will also be the agency responsible for general project supervision, to which end it will create a management unit in charge of requests for financial resources, their transfer to the states, and the submittal of accounts. The highway departments (DERs) will, in coordination with DNER, prepare the actual financial scheduling and the application of resources deriving from the proposed Bank loan and the Federal and State Treasuries.
- 5.36 The organizational structure and the physical, financial and human resources of the agencies participating in that decentralized execution plan have been analyzed. The conclusion is that these agencies have the capacity to execute the proposed project. The technical and administrative capacity of DNER and the DERs has in fact been confirmed by their execution of highway construction and conservation programs, some partially funded by the Bank, in the course of which they demonstrably absorbed a valuable store of training and experience.
- 5.37 As was indicated in the institutional analysis, all the participating agencies are conducting restructuring programs that are benefiting their organizational frameworks and improving their normative and management instruments. This process is backed up by training and upgrading in the areas of information technology, construction and maintenance engineering, environmental protection, road surface management, and highway signs, safety and operations. The range of services contracted out to the private sector has broadened steadily.
- 5.38 Given the upgrading of the organizational structures of DNER, DER/MG and DER/SP, the acceptability of the administrative model proposed for the execution of the project, and the availability of human, technical and financial resources suited to its objectives, no institutional problems are expected to hinder the project.

F. Environmental feasibility

- 5.39 The project provides for detailed environmental impact studies and the associated RIMA report required under Brazilian law prior to the granting of installation and operating permits in the various starting, construction and completion phases. The studies specified have identified the project's direct, indirect, negative and positive impacts, and recommendations and measures have been

formulated to prevent or mitigate negative impacts on the environment. Permits have been granted for the project in the states of Minas Gerais and São Paulo.

- 5.40 The technical specifications and instructions to contractors incorporate the standards, measures and actions that must be followed to prevent or mitigate the project's direct negative impacts. The indirect negative impacts on the environment will not cause significant alterations in the service area, since the territory was occupied in the past and the economic activities are well established. Furthermore, the proposed project is directed at an existing highway, the expansion and modernization of which will be carried out on the present right-of-way.
- 5.41 Expropriation of land will be necessary on some segments or sectors, and approximately 602 families will have to be relocated. These steps are covered in a preliminary plan that will be refined and submitted to the Bank as a condition precedent to the first disbursement. The co-executing agencies have environmentally competent construction supervisors on staff, and the consulting firms used will have to provide the necessary professionals in that discipline.

Direct construction costs
(in US\$000s)

<u>Type of work</u>	Minas Gerais section <u>(217.0 km)</u>	São Paulo section <u>53.7 km)</u>
Earth moving	62,133	34,320
Paving	94,549	26,742
Structures (bridges and viaducts)	25,306	46,585
Tunnels and containments	-	19,493
Drainage	28,437	9,790
Environmental protection	4,229	7,656
Signs and safety	6,194	9,957
Additional construction	9,931	758
Installations for the operation	7,301	5,477
	238,080	160,778
TOTAL	<hr/>	<hr/>
Average cost per km	1,097	2,994

Bidding sections

<u>Section</u>	<u>Length (km)</u>	<u>Estimated cost</u> <u>US\$000S</u>
MINAS GERAIS		
km 420 - km 455	35.0	36,390
km 455 - km 480	25.0	35,479
km 480 - km 509	29.0	31,091
km 509 - km 535	26.0	25,956
km 535 - km 560	25.0	23,696
km 560 - km 584	24.0	24,201
km 584 - km 604	20.0	19,617
km 604 - km 626	22.0	25,450
km 626 - km 637	11.0	16,198
SÃO PAULO		
km 36.3 - km 53.0	16.7	31,132
km 53.0 - km 68.0	15.0	30,575
km 68.0 - km 73.5	5.5	30,563
km 73.5 - km 79.0	5.5	26,289
km 79.0 - km 85.6	6.6	21,523
km 85.6 - km 90.0	4.4	20,696

PROPOSED RESOLUTION

BRAZIL. LOAN /OC-BR TO THE FEDERATIVE REPUBLIC OF BRAZIL

**MODERNIZATION AND EXTENSION OF
THE FERNÃO DIAS HIGHWAY .**

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Federative Republic of Brazil, as Borrower, for the purpose of granting it a loan to cooperate in the financing of a project for modernization and extension of capacity of the Fernão Dias Highway, hereinafter referred to as "the Project". This financing shall be subject substantially to the following conditions:

1. Amount and currencies: Up to US\$267,000,000, or the equivalent thereof in other currencies, except that of the Federative Republic of Brazil, which are part of the ordinary capital resources of the Bank, to pay for goods and services acquired through international bidding in the member countries of the Bank and for such other purposes as may be specified in the loan contract. Payments of amortization and interest shall be made in the currency or currencies specified by the Bank, in an amount equivalent to the corresponding amount owed, calculated in units of account denominated in United States dollars, in accordance with provisions to be included in the loan contract.
2. Source of funds: The ordinary capital resources of the Bank.
3. Guarantee: The general responsibility of the Borrower.
4. Credit fee: 0.75% per annum on the undisbursed portion of the financing, commencing to accrue 60 days after the date of the loan contract and payable in United States dollars on the interest payment dates.
5. Amortization: The Borrower shall amortize the loan over a period of 20 years from the date of the loan contract, in semiannual, consecutive, and, insofar as possible, equal installments. The first installment shall become due and payable six months after the date scheduled for the last disbursement of the financing.

6. Interest: The Borrower shall pay interest semiannually on the daily outstanding balances of the loan. The first payment shall be made six months after the date of the loan contract. The Bank shall determine the interest rates to be applied during the life of the loan, in accordance with the lending rate policy of the Bank.
7. Disbursement: The term for disbursement of the financing shall expire four years after the effective date of the loan contract.
8. Special conditions:
 - (a) The execution of the Project and the use of the resources of the loan shall be performed and coordinated in their entirety by the Borrower, through the Departamento Nacional de Estradas de Rodagem [National Roads Bureau], hereinafter referred to as the "Executing Agency" or "DNER", having as "Co-executing Agencies" the Minas Gerais Roads Bureau and the São Paulo Roads Bureau, hereinafter referred to as the or "DER/MG" and "DER/SP" respectively.
 - (b) The resources of the loan shall be used to participate in the execution of a program the total cost of which is estimated at the equivalent of US\$534,000,000. Consequently, the loan contract shall contain such provisions as the Bank deems appropriate to ensure that such additional resources as may be necessary, in addition to the loan, for the complete execution of the Project shall be duly provided, in an amount estimated in the equivalent of US\$267,000,000, which may include up to US\$73,280,000 equivalent from the budgetary allocations of the State of Minas Gerais, and up to US\$60,220,000 from the budgetary allocations of the State of São Paulo, in accordance with a schedule of investments satisfactory to the Bank.
 - (c) Prior to the first disbursement of the financing, the Borrower, through the Executing Agency, shall demonstrate to the satisfaction of the Bank that the Executing Agency and Co-executing Agencies have hired the consulting services necessary for execution of the Project, in accordance with the terms of reference acceptable to the Bank.
 - (d) The Borrower shall take appropriate measures acceptable to the Bank in order to set up a system for the collection of tolls for using the Project highway segments, from the moment in which these segments start to operate. The revenue from the tolls shall be used to cover the cost of investments made and subsequent maintenance, operation and administration expenses.

- (e) In the acquisition of machinery, equipment and other goods for the Project, and in the awarding of construction contracts, the system of public bidding shall be followed in each case in which the value of such acquisitions exceeds the equivalent of US\$250,000 or the value of such contracts for the execution of works exceeds the equivalent of US\$1,000,000. The bidding shall be subject to the procedures to be appended as an annex to the loan contract.
- (f) The Bank shall establish such inspection procedures as it deems necessary to assure the satisfactory execution of the Project and the Borrower shall extend all cooperation which is required for the most effective accomplishment of this purpose. From the amount of the financing the sum of US\$2,670,000 shall be allocated for credit to the income accounts of the Bank to meet expenses of general inspection and supervision.

RECOMMENDATIONS

- A. It is recommended that the following conditions, to be fulfilled to the satisfaction of the Bank, be included in the loan contract in addition to the conditions set forth in the proposed resolution:
1. Unless otherwise agreed by the parties, prior to each open call for tenders, or if a call for tenders should not be applicable, before any works are initiated, the Borrower, through the Executing Agency, shall submit to the Bank for approval: (a) the engineering projects, specifications, budgets, and other documentation that may be required in connection with the construction and, if applicable, the bidding conditions and other documentation required for the call for tenders; and (b) evidence of legal possession, easements or other pertinent rights to the land so that construction of the works may proceed.
 2. The Bank may recognize as part of the local counterpart contribution for the Project, expenses relating to the hiring of consulting services up to the equivalent of US\$350,000, in cruzeiros, incurred within the 18 months prior to the date of the resolution, provided that requirements substantially similar to those set forth in the resolution and the loan contract have been met.
 3. Prior to awarding the contract pertaining to the works of the Guarulhos Municipality segment, the Borrower, through the Executing Agency, shall submit to the Bank the family-resettlement plan for the municipality's affected families.
 4. Prior to initiation of the works of the Guarulhos Municipality segment, the Borrower, through the Executing Agency, shall present to the Bank that it has initiated the execution of the family-resettlement plan referred to in recommendation A.3.
 5. The Borrower, through the Executing Agency, shall present to the Bank: (i) within 24 months from the date of the loan contract, the studies for the implementation of the Environmental Protection Areas of the Jaguari-Camanducaia and Sapucaí-Sapucaí Mirim rivers basins; and (ii) within 36 months from the date of the loan contract, evidence that: (A) the State of Minas Gerais has assigned enough resources to initiate the implementation of the above mentioned Environmental Protection Areas and that has undertaken to include in the annual budget proposal enough resources to fully implement the cited areas; and (B) that the implementation of the Environmental Protection Areas has been initiated.

6. The Borrower, through the Executing Agency, shall present to the Bank: (a) within the second year of the effective date of the loan contract, a detailed plan for operating the toll-booths referred to in paragraph 8(d) of Appendix I, including a proposal for the collection of tolls; and (b) within the fourth year of the effective date of the loan contract, evidence that: (i) the weighing stations of the highway segments included in the Project have been put into operation, and (ii) Emergency Operational Manual has been put into effect.
 7. The Borrower, through the Executing Agency, undertake to submit to the Bank, within 10 years from the fifth year of the effective date of the contract, annual reports containing the following statistics from the previous year: (a) the number of transport vehicles weighed at each station; (b) the number and volume of excess loads found; (c) the number of penalties imposed; and (d) the amounts collected from payment of tolls.
 8. The Borrower, through the Executing Agency, undertake that: (a) the highway BR-381 between the Sao Paulo-Belo Horizonte-Governador Valadares (BR-116) segments, its immediate accesses and equipment shall be duly maintained in accordance with generally accepted technical standards; and (b) they shall submit to the Bank before August 31 of each year for 10 years after the date of the loan contract a report on the maintenance of the works, accesses and equipment and the annual maintenance plan for the following fiscal year, in accordance with Section VI of Appendix III. Should it be determined through inspections conducted by the Bank or from the reports the Bank has received that maintenance has been performed below the standards stipulated, the Borrower and the Executing Agency shall take such action as is appropriate to ensure that the shortcomings are fully corrected.
 9. During Project execution the Borrower, through the Executing Agency, shall submit to the Bank, semestral progress reports on the Project containing the following information: (i) the number of families relocated; (ii) the location of the new dwellings, their description and characteristics, as well as a detailed list of public services supplied; (iii) the degree of fulfillment of the conditions laid down in the family-resettlement plan referred to in recommendation 3 above, and (iv) the budgetary resources assigned to the implementation and operation of the Environmental Protection Areas mentioned in recommendation 5 above.
 10. The financial statements of the Project during its execution, audited by the Departamento do Tesouro Nacional of the Ministerio da Fazenda, shall be submitted each year to the Bank.
- B. The loan contract shall include an annex that is materially similar to Appendix III (The Project).

THE PROJECT

Annex A to the Loan Contract

I. Objective

- 1.1 The main objectives of the project are to: (i) provide efficient road transport services between the metropolitan regions of Belo Horizonte and São Paulo; (ii) provide an alternative route in the north-south corridor of the country's Atlantic coast; (iii) improve safety conditions for users of the Fernão Dias highway (BR-381); (iv) help implement economic activities in its service area; and (v) establish the frame of reference and actions needed for recovery of investments.

II. Description

- 2.1 The project comprises execution of the first stage of the modernization and expansion of capacity works of approximately 269 km, of which 217 km are located in the state of Minas Gerais between kilometer 420 (municipality of Contagem) and kilometer 637 (access to the village of Nepomuceno), and 52 km in the state of São Paulo, from its intersection with the President Dutra highway (BR-116), to its intersection with the Dom Pedro I state highway (SP-61) at kilometer 37.
- 2.2 In particular, the following works will be carried out:
- (i) Recovery and improvement of the surface of approximately 269 km of alignment.
 - (ii) Construction of 269 km of paved roadway parallel to the existing one and with similar technical features.
 - (iii) Expansion of existing bridges and drainage systems, as required.
 - (iv) Construction of two parallel tunnels on the segment located in the Serra da Cantareira.
 - (v) Construction, improvement and expansion of the access and through roads in the highway's urban service areas.
 - (vi) Arrangement and placement of road safety devices, including lateral barriers, horizontal and vertical traffic signs and additional landscaping and environmental-protection works.
 - (vii) Construction and installation of three toll-booths (two in Minas Gerais and one in São Paulo); six highway police

checkpoints (four in Minas Gerais and two in São Paulo) and a vehicle weight-control station in São Paulo.

III. Project cost and financing plan

- 3.1 The total cost of the project is estimated at US\$534,000,000 equivalent, in accordance with the following distribution by investment category and source of financing:

Project cost and financing (in US\$ thousands)						
Investment Category	Bank OC	Local contribution			Total	%
		Borrower	State of Minas Gerais	State of São Paulo		
1. <u>Engineering and Administration</u>	-	900	19,035	10,730	30,665	5.8
1.1 Supervision	-	-	16,695	9,800	26,495	5.0
1.2 Administration	-	900	2,340	930	4,170	0.8
2. <u>Direct costs</u>	232,225	91,948	44,580	30,105	398,858	74.7
2.1 Construction	232,225	91,948	44,580	30,105	398,858	74.7
3. <u>Associated costs</u>	-	-	3,545	15,180	18,725	3.5
3.1 Rights of way	-	-	3,545	6,150	9,695	1.8
3.2 Resettlement of families	-	-	-	9,030	9,030	1.7
4. <u>Financial costs</u>	2,670	27,941	-	-	30,611	5.7
4.1 Interest	-	27,157	-	-	27,157	5.1
4.2 Credit fee	-	784	-	-	784	0.1
4.3 IDB inspection	2,670	-	-	-	2,670	0.5
5. <u>Unallocated</u>	32,105	12,711	6,120	4,205	55,141	10.3
5.1 Escalation	6,007	2,378	1,110	821	10,316	1.9
5.2 Contingencies	26,098	10,333	5,010	3,384	44,825	8.4
T O T A L	267,000	133,500	73,280	60,220	534,000	100.0
P E R C E N T A G E	50.0	25.0	13.7	11.3	100.0	

IV. Procurement

- 4.01 When goods to be procured or services to be contracted for the Project, including those related to any form of transportation or insurance, are to be financed in whole or in part with foreign exchange from the financing, the procedures and specific requirements for the bidding or other forms of contracting shall permit the unrestricted participation of goods and services from member countries of the Bank. Consequently, no conditions that would prevent or restrict the offer of goods or the participation

of contractors from such countries shall be established in such procedures or specific requirements.

V. Consulting services

- 5.1 (a) Prior to issuing a call for bids for consulting services to be financed with local counterpart resources, the Borrower shall agree with the Bank on the terms of reference for such services.
- (b) Prior to the contracting of such services, the Borrower shall inform the Bank of the names and background of the selected firms and the fees agreed upon.

VI. Maintenance

- 6.1 The purpose of the maintenance is to preserve the highway BR-381, its accesses and equipment at a level compatible with the services they should provide.
- 6.2 The annual maintenance report described in recommendation A. 8 shall include:
- (a) general information that includes:
- (i) the organizational structure of the entity in charge of the maintenance and its responsibilities;
 - (ii) the classification, number and distribution of personnel in the weight-control stations, toll-booths and highway police posts, as well as the type, number, distribution and operating conditions of the equipment to be used in the maintenance; and
 - (iii) the current maintenance contracts, their term, coverage and degree of execution.
- (b) an evaluation of the conditions of transitiability of the complimentary highway net of the BR-381 between Sao Paulo-Belo Horizonte-Governador Valadares (BR-116);
- (c) an evaluation of the execution of the maintenance plan for the previous year, which shall include:
- (i) a comparison of the current conditions of the separate highway sections with the conditions indicated in the previous year's inventory;
 - (ii) the statistics relating to activities accomplished, to the volume of executed works, and to the material and financial resources utilized, as regards both the

activities executed by force account and those contracted out; and

(iii) the extent to which the plan has been carried out, its degree of efficiency and the adjustments that should be made in such plan.

(d) the highway maintenance plan for the following fiscal year, with justification of the priorities established therein, the activities that shall be executed and the corresponding execution schedule. In addition, the plan shall indicate both the material resources required and the budget proposal, appropriately itemized. This budget shall include annual resources sufficient to carry out the maintenance.

6.3 The first annual maintenance report shall include the plan corresponding to the fiscal year following that of the effective date of the loan contract.