

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

GUYANA

MOLESON CREEK – NEW AMSTERDAM ROAD

(GY-0076)

LOAN PROPOSAL

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BASIC SOCIOECONOMIC DATA

The basic socioeconomic data for Guyana available on the Internet at the following address:

www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata

INFORMATION AVAILABLE IN THE FILES OF RE3

PREPARATION:

Roughton International

Structural Feasibility Report, December 2003

Roadways Feasibility Report (pavements, traffic data and design criteria), December 2003

Environmental Impact Assessment Report, December 2003

Environmental Management Plan, January 2004

Economic Assessment and Cost Estimates, April 2004

NDLEA

Basic Report, Alternative Southern Approach to Georgetown, September 2003

Route Selection Report, Alternative Southern Approach to Georgetown, September 2003

Public Transport Report, Alternative Southern Approach to Georgetown, September 2003

Draft Final Report, Alternative Southern Approach to Georgetown, March 2004

Georgetown Arterial Road System, Alternative Southern Approach to Georgetown, April 2004

M.H. Montplaisir

Action Plan for the Central Transport Planning Unit (CTPU) and Review of WSG, March 2004

Gordon P. Bodely

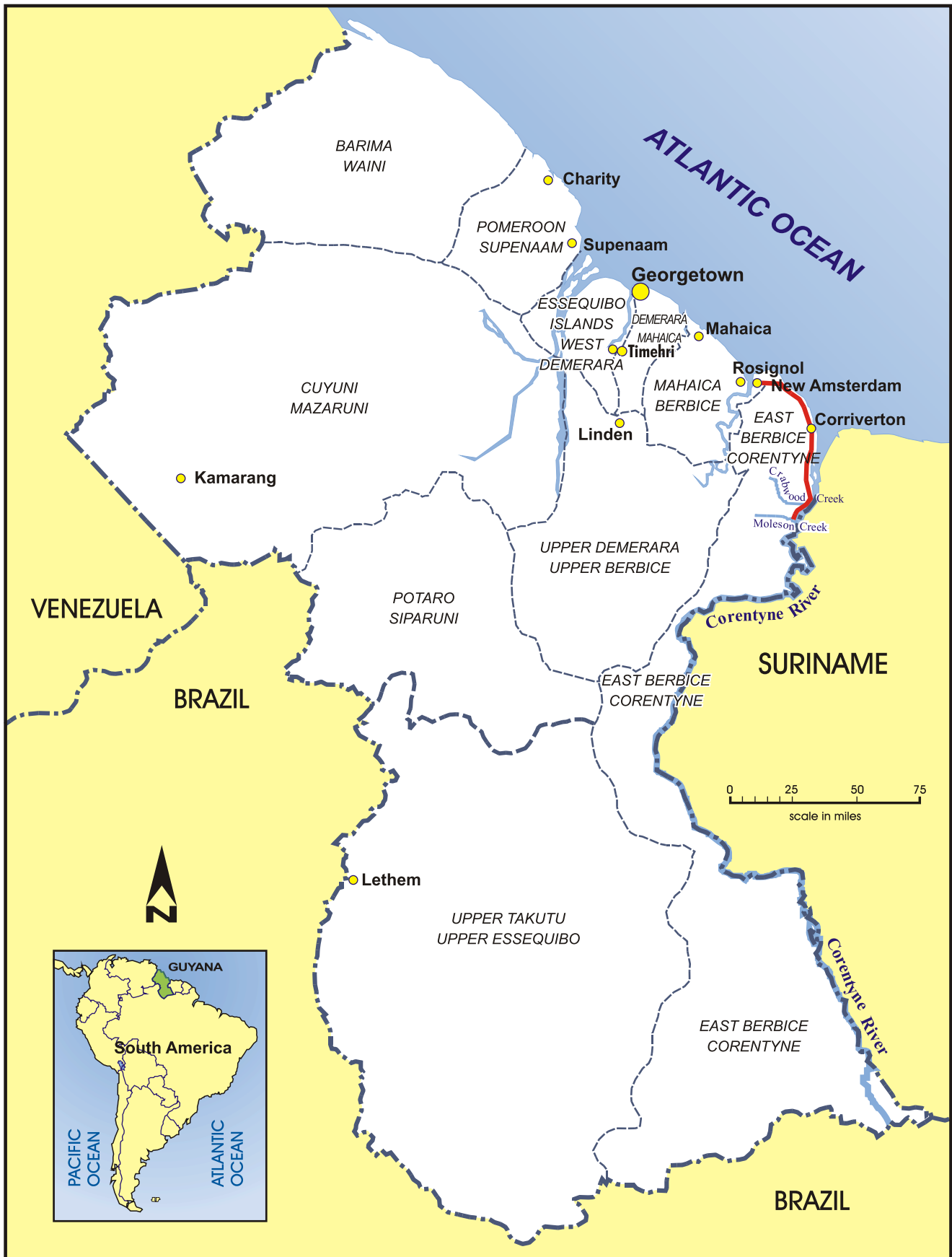
Institutional Strengthening of the Central Transport Planning Unit, February 1997

ABBREVIATIONS

CDB	The Caribbean Development Bank
CJIA	Cheddi Jagan International Airport
CTB	Central Tendering Board
CTPU	Central Transport Planning Unit
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESS	Environmental and Social Strategy
EU	European Union
GOG	Government of the Cooperative Republic of Guyana
HIPC	Heavily-Indebted Poor Countries
ICAO	International Civil Aviation Organization
ICB	International Competitive Bidding
IIRSA	Regional Infrastructure Integration in South America
IRR	Internal Rate of Return
MPW&C	Ministry of Public Works & Communications
MRR	Mahaica-Rosignol Road
NACCR	New Amsterdam to Crabwood Creek Road
NPV	Net Present Value
PEU	Project Execution Unit
PTI	Poverty Targeted Investment
RAD	Roads Administration Division
RDC	Regional Democratic Council
RMMS	Routine Maintenance Management System
UNDP	United Nations Development Program
WCP	Weight Control Program
WSG	Works Services Group

GUYANA

Moleson Creek - New Amsterdam Road Rehabilitation (GY- 0076)





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IDB LOANS

APPROVED AS OF APRIL 30, 2004

	US\$Thousand	Percent
TOTAL APPROVED	838,127	
DISBURSED	644,839	76.93 %
UNDISBURSED BALANCE	193,288	23.06 %
CANCELATIONS	41,405	4.94 %
PRINCIPAL COLLECTED	231,511	27.62 %
APPROVED BY FUND		
ORDINARY CAPITAL	115,230	13.74 %
FUND FOR SPECIAL OPERATIONS	715,963	85.42 %
OTHER FUNDS	6,934	0.82 %
OUTSTANDING DEBT BALANCE	413,329	
ORDINARY CAPITAL	18,159	4.39 %
FUND FOR SPECIAL OPERATIONS	395,170	95.60 %
OTHER FUNDS	0	0.00 %
APPROVED BY SECTOR		
AGRICULTURE AND FISHERY	250,505	29.88 %
INDUSTRY, TOURISM, SCIENCE AND TECHNOLOGY	37,857	4.51 %
ENERGY	106,366	12.69 %
TRANSPORTATION AND COMMUNICATIONS	128,059	15.27 %
EDUCATION	92,568	11.04 %
HEALTH AND SANITATION	80,562	9.61 %
ENVIRONMENT	900	0.10 %
URBAN DEVELOPMENT	48,399	5.77 %
SOCIAL INVESTMENT AND MICROENTERPRISE	50,989	6.08 %
REFORM AND PUBLIC SECTOR MODERNIZATION	40,988	4.89 %
EXPORT FINANCING	934	0.11 %
PREINVESTMENT AND OTHER	0	0.00 %

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



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STATUS OF LOANS IN EXECUTION AS OF APRIL 30, 2004

(Amount in US\$ thousands)

APPROVAL PERIOD	NUMBER OF LOANS	AMOUNT APPROVED*	AMOUNT DISBURSED	% DISBURSED
<u>REGULAR PROGRAM</u>				
Before 1998	2	45,100	23,405	51.90 %
1998 - 1999	5	104,000	38,096	36.63 %
2000 - 2001	3	53,900	14,494	26.89 %
2002 - 2003	4	65,850	1,748	2.65 %
TOTAL	14	\$268,850	\$77,743	28.92 %

* Net of cancellations. Excludes export financing loans.



Inter-American Development Bank
Regional Operations Support Office
Operational Information Unit

Guyana

Tentative Lending Program

2004

Project Number	Project Name	IDB US\$ Millions	Status
GY0077	Health Sector Program	23.0	
GY0053	Fiscal and Financial Management Program	28.0	
GY0011	Agricultural Support Services	20.0	
GY0076	Moleson Creek-New Amsterdam Road	37.3	
* GY1002	Trans World Telecom Guyana	18.0	
GY0055	Georgetown Solid Waste Management	9.5	
GY0073	Public Management Modernization Program	5.0	
Total - A : 7 Projects		140.8	
GY0066	Information & Communications Technology	21.3	
GY0071	Citizen Security Program	7.0	
Total - B : 2 Projects		28.3	
TOTAL 2004 : 9 Projects		169.1	

2005

Project Number	Project Name	IDB US\$ Millions	Status
GY0075	Timehri Bypass Road	40.0	
GY0074	Rural Roads Program	20.0	
Total - A : 2 Projects		60.0	
TOTAL - 2005 : 2 Projects		60.0	

Total Private Sector 2004 - 2005	18.0
Total Regular Program 2004 - 2005	211.1

* Private Sector Project

Moleson Creek – New Amsterdam Road

(GY-0076)

EXECUTIVE SUMMARY

Borrower:	The Government of the Cooperative Republic of Guyana (GOG)		
Executing agency:	The Ministry of Public Works & Communications (MPW&C)		
Amount and source:	IDB: (FSO)	US\$	37,300,000
	Cofinancing:	US\$	0
	Local:	US\$	4,150,000
	Total:	US\$	41,450,000
Financial terms and conditions:	Amortization Period:	40	years
	Grace Period:	10	years
	Disbursement Period:	5	years
	Interest Rate:	1% during grace period 2% thereafter	
	Supervision and Inspection:	1.00	%
	Credit Fee:	0.50	%
	Currency:	US Dollars	
Objectives:	The main objective of the project is to lower transport costs and reduce accident rates, improving access to an important agricultural zone and facilitate regional integration between Guyana and Suriname, within the Regional Infrastructure Integration in South America (IIRSA) initiative, through the rehabilitation and improvement of the New Amsterdam-Moleson Creek road. Additional objectives include providing support for the institutional strengthening of the MPW&C especially in the areas of transport planning, project design, supervision and reporting and road safety, and the preparation of studies.		
Description:	The Project consists of three main components, an institutional strengthening component for the MPW&C, an investment component for road works and a component including the feasibility study of the Demerara River Crossing, urban		

transportation studies for Georgetown and rural transportation studies:

(1) Institutional Strengthening of the MPW&C (US\$ 3.05 million)

The institutional component will finance the continuation of ongoing activities directed at improving the institutional capacity of the MPW&C, based upon the institutional improvement plan developed under the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). Specific support will be provided to strengthen the MPW&C's capacity, through the Central Transport Planning Unit (CTPU), to evaluate and set transport policies, carry out transport planning and prioritize all mode transport investments. This component will also provide support for the Works Services Group (WSG), the specialized unit responsible for road system management, project execution, supervision and reporting of road and bridge investment and maintenance works, strengthening the implementation of its action plan.

(2) Moleson Creek–New Amsterdam road rehabilitation (US\$ 32.8 million)

The investment component would provide funds for the: (1) rehabilitation of the 2-lane 81 km New Amsterdam to Crabwood Creek Road and the improvement of the 5-km road from Crabwood Creek to Moleson Creek, located on the Corentyne river, the border between Guyana and Suriname; (2) rehabilitation of related bridges and drainage structures; and (3) improvement of "critical spots" (unsafe road locations with high accident rates). This road investment component will complete the improvement of the eastern Atlantic shore road system commenced with the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). This network connects Georgetown to the major population centers on the Atlantic coast and provides the only land transport integration link with Suriname.

(3) Feasibility study and preparation of final designs (US\$ 2.30 million)

Feasibility Study of the Demerara River Crossing. The Demerara Harbour Bridge is a major integration link between the Georgetown / East Demerara and West Demerara / Essequibo Regions. It is a floating steel bridge with 7.2 m. of two-lane carriageway, 1m. wide pedestrian sidewalk, and no proper collision protection. The bridge, constructed in 1978, was designed to last for 10 years, rehabilitation works were completed in 1995, and extended the bridge's life by 15 years, coming to an end in

2010. An average of 8,400 vehicles cross the bridge per day. The bridge is retracted once a day for one and a half hours, causing major delays and congestion. At present the annual operation cost totals US\$ 1.1 million, and the revenues are US\$ 1 million. The revenues to be collected cannot offset the cost of the next maintenance major activities, scheduled for 2007. A feasibility study and an Environmental Impact Assessment will be undertaken for a new crossing across the Demerara River; its location will be selected based on technical, economic and environmental analysis of different alternatives; an analysis for a DBOT, or other arrangements involving private sector participation will be included.

Urban transport study for Georgetown. In April 2003 the GoG commissioned a study that evaluated the arterial road system and the public transport needs in the city of Georgetown and its metropolitan area and has concluded that the current urban transportation services and the urban road network of Georgetown cannot support the increasing demand, and will become unsafe and costly for the users. The current urban traffic conditions will worsen when the ongoing widening of the existing southern approach to Georgetown (construction of two additional lanes between the city and the Demerara Bridge) will be completed in 2005. Therefore, it is urgent to carry out a transportation study, focusing mainly on existing entry and access routes, traffic flow and management, safety, and institutional aspects, with the following principal components: i) policy and institutional strengthening, and ii) traffic management and road safety improvements. The first component will evaluate and prioritize the requirements in the institutional, legal, regulatory, and infrastructure areas. The second component will develop traffic regulations and control procedures, public transportation plans, and final designs of solutions to ease traffic congestion and improve road safety through improvements in the capacity of the urban road system, upgrading intersections, changing traffic flows, etc.

Rural Transportation. Several studies, preparatory of the rural transportation program (GY-0074), will be developed under this subcomponent, including: i) diagnostic of rural transport: transport modes, affected population, beneficiaries, transport costs, transport services provided for freight and passengers, impact upon production and means of subsistence; ii) development of a planning system that will allow identification in investment priorities, giving fundamental importance to users, beneficiaries and local authorities' participation in the identification process; iii)

preparation of technical, environmental and social basic standards for the planning and execution of a rural transport program. These standards will expand during the execution process; iv) engineering designs for rehabilitation of rural roads, small docks, and other rural transportation infrastructure; v) development of methodologies that will allow sustainable management (operation and maintenance) of the rehabilitated infrastructure and related services. The participation of the communities and local governments in the financing of maintenance will be of particular importance; and vi) preparation of the baseline that will allow the measurement of social and economic impacts of the rural transport improvement.

**Bank's country
and sector
strategy:**

The Bank's strategy in Guyana, expressed in the Country Paper (GN-2228), seeks to achieve medium-term poverty reduction through activities that will: (i) lead to sustainable economic growth; (ii) improve governance and public sector efficiency; and (iii) strengthen social programs. The program supports the objective of sustainable economic growth by improving critical transport infrastructure in one of the most important economic regions of Guyana. These improvements will reduce transport costs and increase market accessibility, reducing important barriers to increased productivity and creating a more attractive environment for private sector investment. By facilitating transportation, the program will increase the accessibility of essential social services to the Guyanese communities living in the surrounding areas. In terms of modernization of the public sector, the Program supports actions designed to increase the efficiency and effectiveness of the MPW&C, particularly through the institutional strengthening of both the CTPU and WSG.

The country's strategy in the transport sector aims at reducing transportation costs, improve market access and overall competitiveness, and increase coverage of main roads, bridges and other infrastructure by management contracts. The Project will increase competitiveness by reducing both users costs and future reconstruction costs through rehabilitation and maintenance of part of the road network that has completed its economic life expectancy, and will improve safety of pedestrians and traveling public

**Environmental/
social review:**

The net potential socio-environmental impacts of the Project are, in general, likely to be positive. By improving the physical, operational and safety conditions of the road, the Project can potentially make important positive contributions to socio-environmental quality in the Project area, favoring the rural

population of Guyana, who rank among the poorest in the hemisphere, as the road traverses an eminently agricultural region and is the main source of market access for agricultural producers.

Given the type, size and technical simplicity of the proposed civil works, as well as the fact that they will take place mostly within the existing right-of-way of a corridor that serves consolidated urban and rural areas, the Project is not anticipated to generate permanent, widespread or irreversible significant negative impacts.

In general, the anticipated negative impacts of the Project can be characterized as easily identifiable, minor to moderate in magnitude, temporary in duration and spatially restricted. These negative impacts will be avoided, mitigated, corrected and/or compensated through the implementation of the environmental and social management, supervision and monitoring plan designed for the Project.

The plan is comprised of the following three components: i) Impact Mitigation (Environmental Management Plan, General and Particular Environmental Specifications, and Preconstruction Conferences); ii) Supervision and Monitoring (Supervision, Inspection and Enforcement, and Socio-Environmental Monitoring Program) and iii) Training.

As a condition for the issuance of the Environmental Permit required by the Environmental Protection Act for the implementation of the Project, the MPW&C submitted an Environmental Management Plan (EMP) and a supporting Environmental Study, both prepared by a consulting consortium formed by local and international specialists. The EMP was approved by the national environmental authority, the Environmental Protection Agency, and the Environmental Permit was granted in March 2004.

The EMP and the General and Particular Environmental Specifications included as an attachment to it will be part of tender documents for construction contracts that must be observed by contractors and subcontractors.

The CESI reviewed Project documents in its October 24, 2003 meeting, and its recommendations are included in the ESMR. The CESI reviewed and verified the Project Report and the ESMR during its April 2, 2004 meeting (CESI 13-04).

Benefits:

The strengthening of the MPW&C through the implementation of an action plan for the CTPU will improve the capacity to set transport policies, carry out evaluation, planning, and prioritization of transport investment and regulate public transport. Additionally, WSG's action plan was reviewed to ensure its implementation as intended, and that the goals and objectives have been achieved. On the basis of this review, the action plan was updated, and this Program will finance its strengthening.

The economic benefits of the rehabilitation of the New Amsterdam-Moleson Creek were evaluated using the HDM-4 model. The IRR, without consideration of benefits due to accident reduction and with safety measure costs included, is 31.3 % with a corresponding NPV of US\$ 75.47 million. These results are quite robust. For example, with a cost increase of 100% and 0% growth over the evaluation period, the IRR would be reduced to 17% and the NPV would be US\$ 16.6 million.

Risks:

The risk of procurement delays was associated with the institutional weaknesses of the Central Tendering Board (CTB). However, new procurement bills approved in May 2002 and June 2003 represent an improvement and a new National Tender Board with public and private representation has been created by law to replace the existing CTB, although its provisions have not yet been implemented. To contribute to reduce this risk, GOG informed that World Bank committed to providing additional assistance in the implementation of the law through the development of relevant regulations and procedures. Additionally, with support from the IADB and other financial institutions, research and analyses have been undertaken and study reports prepared in support of preparing a country procurement assessment report.

Another risk is the weakness of the MPW&C to monitor contractors, and to avoid implementation delays and possible contractor's claims which may result in major cost overruns. The Project Team recommends continuing with the performance based lump-sum procedure implemented in the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), the airside rehabilitation of the Cheddi Jagan International Airport as part of the Air Transport Reform Program (LO-1042/SF) and the Bridges Rehabilitation Program (LO-999/SF), and that the MPW&C has accepted. Lump-sum contracts will be used for the rehabilitation works (including 3-years routine maintenance works) and for engineering supervision using ICB procedures.

To further reduce risks associated with institutional weaknesses, delays in initiation that may lead to cost overruns, and implementation, the Project will provide funds to continue with the on-the-job institutional strengthening of the WSG through development and implementation of an action plan, improved management information systems, procedures, technical assistance, training, etc. Additionally, an engineering consulting firm, selected through an International Competitive Bidding Process (ICB), will have a major role in the supervision of the civil works. These measures will reduce the risk associated with the relatively weak institutional capacity of the MPW&C.

**Special
contractual
clauses:**

Prior to first disbursement of the loan, the Executing Agency shall be subject to the fulfillment, to the satisfaction of the Bank, of the following requirements: a) the Central Transport Planning Unit (CTPU) is fully staffed (Chief Transport Planning Officer, Transport Planning Officer, Transport Economist and Planning Technician have been hired) with commitments for at least the first year of Project execution (§ 2.7); b) the CTPU has prepared a first year work program for land, river and air modes of transportation and has an approved budget that includes the counterpart funds necessary for the first year of execution (§ 2.7), c) the terms of reference for the required studies and/or consultants for both the CTPU and WSG have been drafted (§ 2.7 and § 2.9); d) the WSG is fully staffed (Highway Engineer, Contracts / Procurement Specialist, and Materials Engineer have been hired) (§ 2.8); e) an external auditing firm of independent public accountants have been hired by the Borrower in accordance with Bank Policies and Procedures for the hiring of independent auditing firms (§ 3.15); and f) evidence that the CTPU and WSG have been merged into a single coordinated Unit of the MPW&C (§ 2.6).

Prior to tender documents approval, the Executing Agency will incorporate as part of these documents a) the EMP including its mitigation, management, supervision, monitoring and training provisions, as well as the attachment containing the General and Particular Environmental Specifications (§ 4.27), and b) the requirement that the Contractor hires an Environmental Manager, and the supervision firm hires an Environmental Inspector, as part of their field personnel (§ 4.28).

At least one month prior to requesting the Bank's no-objection on the final version of the Bidding Documents and Request for Proposals from the pre-qualified civil works contractors, the

Borrower shall present to the satisfaction of the Bank evidence that the Engineering Supervisory firm for the Civil Works Component has been hired to review and evaluate such Bidding Documents and Request for Proposals (¶ 3.6).

Coordination with other MDBs

The World Bank has disbursed US\$20 million, out of US\$26 million, in an Infrastructure Rehabilitation Project focused mainly on the rehabilitation of the Essequibo coast road and maintenance of sea defenses. The European Union (EU) financed a US\$25.9 million Economic Infrastructure Rehabilitation Project including rehabilitation of sea defenses and the Demerara Harbor Bridge. Additionally, the EU financed the establishment of a ferry service between Suriname and Guyana. The EU is preparing a national transportation plan which objectives are to provide a coherent and consistent policy and strategy for the development of the transport sector over the next 12 years, to identify the requirements in the areas of policy, legislation, institutional arrangements, regulation, service provision and implementation for the sustainable growth of the sector. The Caribbean Development Bank (CDB) has fully disbursed its US\$20M for the rehabilitation of the Linden-Soesdyke highway and selected streets in the town of Linden. CDB has recently approved a US\$19.1M operation to finance the upgrading of the existing southern approach from the Demerara Harbor Bridge to the city of Georgetown, to a four-lane facility, and is financing the rehabilitation of the West Demerara Highway from the Demerara Harbor Bridge to Vreed-en-Hoop.

Poverty-targeting and social equity classification:

This operation qualifies as a social equity enhancing project, as described in the indicative targets mandated by the Bank's Eighth Replenishment (document AB-1704). Furthermore, this operation qualifies as a poverty targeted investment (PTI) (see ¶ 4.34 and ¶ 4.35). The borrowing country will not be using the 10 percentage points in additional financing.

Exceptions to Bank policy:

None

Procurement:

The threshold above which procurement will be subject to ICB is US\$ 250,000 for goods and services, US\$ 1,000,000 for civil works, and US\$ 200,000 for consulting services. All bank-financed civil works (rehabilitation of Moleson Creek – New Amsterdam Road) will be let in one package to pre-qualified firms.

I. FRAME OF REFERENCE

A. Socioeconomic framework

- 1.1 Guyana is a low-income, thinly-populated country with a predominantly agricultural economy. The total population according to the 1991 census was 723,000. Population growth since then is thought to have been marginal owing to substantial emigration. The vast majority of the population (around 70%) lives in the coastal strip. The rural interior is very sparsely populated, with communication being predominately along waterways, and/or by air and road to the coast. The country is divided into 10 Regional Democratic Councils (RDCs). Regions 1, 7, 8, and 9 are classified as the interior regions - rural and remote, with small populations. Regions 2, 3, 4, 5, and 6 are the coastal regions, and Region 10 has one moderate sized town and a large rural area. Region 4 includes Georgetown, the capital, and represents the largest concentration of population.
- 1.2 Despite rich endowments of mineral resources, biodiversity and land, economic development was stymied in the 1970s and 1980s by a state-led development strategy which reduced GDP per capita to one of the lowest levels in the region. Beginning in 1988, policy reforms in the fiscal, monetary, exchange rate and structural areas successfully stabilized the economy and gave the private sector a wider role. The liberalized policy framework had highly positive effects from the early 1990s onwards: during 1991-97, real GDP growth averaged 7% per year, while inflation was reduced from over 100% in the late 1980s to 4.5% in 1997. GDP per capita almost doubled in the 1990-97 period, from US\$482 to \$956, causing absolute poverty to fall from 43% (1993) to 35% (1999).
- 1.3 Notwithstanding these improvements, Guyana remains among the poorest countries in the Americas. It was ranked 92nd in the United Nations Development Program (UNDP's) 2003 Human Development Index Report, the lowest ranking in the English-speaking Caribbean. Deterioration in economic performance since 1997 indicates that there is also likely to have been a partial reversal of the downward trend in poverty. Inflation has remained low, yet growth averaged just 0.7% in the 1998-2002 period. A number of important factors have contributed to the downturn, including adverse movements in the terms of trade; large public sector wage increases; political instability; increasing rates of crime, and the slowing pace of structural reform.
- 1.4 The impact of these factors has been softened somewhat by the impact of debt relief awarded under the original and enhanced Heavily-Indebted Poor Countries (HIPC) Initiatives. After receiving US\$256.4 million in net present value terms under the original HIPC framework in May 1999, Guyana gained permanent access to additional debt relief totaling NPV \$334.5 million under the enhanced HIPC Initiative, upon reaching the completion point in December 2003. The IDB is the single largest donor to Guyana under the HIPC initiative, with a share of just under 20% of the total. Debt relief under the two initiatives has allowed public spending to rise substantially. Pro-poor growth spending -on education,

health, housing and water, and other poverty alleviation programs- grew by more than a third in the 1998-2002 period to reach 21% of GDP, compared to an overall rise in spending of only 3%. Total capital expenditure, on the other hand, has experienced broad decline, from an average of 17.8% of GDP in 1995-97 to 13.4% in 2000-02, although underestimation of GDP tends to inflate these ratios.

B. Transport Sector

1. Transport Infrastructure

- 1.5 The transport system consists basically of an inadequate road network, providing little internal and international connections, highly congested roads in urban areas and poor and expensive transport services (ferries and buses). Air service and river transport to the interior is sporadic and limited by inadequate infrastructure. Guyana has 98 km of railroads entirely dedicated to ore transport, one international airport, and 46 additional airstrips with short runways. The country has a single general cargo seaport in Georgetown, and 4 specialized bulk loading facilities. Guyana relies upon its 6,000 km of navigable water-ways used for carrying bauxite, sugar cane or other bulk commodities. A limited number of ferries and river taxis are used to cross the three larger rivers.
- 1.6 Although the road network is one of the sparsest in South America, most of the population has access to paved roads, mostly in fair conditions, due to the concentration of the population and the main road system in the coastal areas. Since Guyana has only two bridges crossing major rivers, the lack of adequate river crossings limits the expansion of the road system. The road network in the interior is short and in bad condition, consisting mainly of roads open only during the dry season and limited to 4wd drive vehicles. All national paved roads have only two lanes and they serve a national fleet of about 52,000 vehicles. The road network of Guyana totals 3,995 kilometers. The national paved road network originates in Georgetown and consists of four main roads of about 500 kilometers.
- 1.7 The lack of effective road maintenance has increased traffic hazards and has reduced the effective life expectancy of existing infrastructure increasing the need for and cost of road rehabilitation. Periodic and routine annual needs for national paved roads maintenance at minimum standards are estimated at US\$ 4.2 million, of which 85% is needed for periodic maintenance (the minimum annual expenditure is US\$ 3.5 million, while the optimum level is US\$ 5 million), and 15% is needed for routine maintenance (the minimum and optimum annual expenditures are US\$ 0.7 and US\$ 1.2 million respectively). Current expenditures of the Ministry of Public Works and Communications (MPW&C) for routine maintenance have averaged US\$ 620,000 per year. Current expenditures are less than the minimum annual level of US\$ 2,300 per kilometer estimated for the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). The optimum and minimum annual expenditures needed for routine maintenance works have been determined by the Routine Maintenance Management System (RMMS) for a road sample of 85 kilometers, and range between US\$ 3,000 and US\$ 1,500

respectively. Almost all maintenance has been concentrated on the paved road system, mainly road surface and drainage works, resulting in most of these roads being in fair condition, while the unpaved roads are generally poor. Based on a combination of optimum and minimum standards obtained from the RMMS, safety, periodic and routine maintenance works on 85 km of main roads have been tendered and awarded to private firms. In addition, to better support road performance and optimize routine maintenance expenditures, a Weight Control Program (WCP) and the establishment of six permanent weight stations are financed by the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF).

2. The Road Network

- 1.8 The road network of Guyana totals 3,995 kilometers and is classified as follows: i) main roads (940 Km), ii) feeder roads (820 Km), iii) all weather trails (1,125 Km), and iv) earthen trails (1,110 Km), respectively representing 24%, 21%, 28% and 28% of the total network.

3. Institutional Framework

- 1.9 Government responsibilities in the transportation sector are spread among various agencies, with the MPW&C taking on the main role. The MPW&C is basically responsible for transport policy and the provision and maintenance of almost all major transport infrastructure. The Ministries of Agriculture and Local Government assume the responsibility for providing and maintaining some local infrastructure while the Ministry of Home Affairs assumes some regulatory functions regarding safety and security of transport services.
- 1.10 With funding from the IDB, major rehabilitation work was undertaken on the east west corridor stretching from Timehri to Mahaica as part of the Main Roads Rehabilitation Program (LO890/SF). The World Bank financed the rehabilitation of the main road in the Essequibo area (US\$ 17.0 million). Because of the limited institutional and organizational capacity of the MPW&C, a Project Execution Unit (PEU) was established in 1993 to oversee and monitor the execution of both loan programs.
- 1.11 The MPW&C's capacity to perform the function of executing agency has been affected over the years by the difficulty to retain its core technical and professional staff due to declining real wages over time. An attempt to address this situation and improve contract administration resulted in the formation of semi-autonomous Project Executing Units within the Ministry, thereby enabling them to offer better conditions outside those of the public service management guidelines. This situation gave rise to ineffective and inefficient use of both human and physical resources and high levels of redundancy.
- 1.12 As part of the design of the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF) and Bridges Rehabilitation Program (LO-999/SF), and with the objective of consolidating the administration of the road sector and formulating an

Institutional Improvement Plan, an Institutional and Organizational Capacity Assessment was undertaken. This Plan consisted of the following elements; i) strengthening national transport planning and policy formulation; and ii) institutional reform to improve the capacity of the MPW&C to plan, design and supervise construction, rehabilitation and maintenance of roads and bridges. The Work Services Group (WSG) has assumed these responsibilities for the main roads and bridges.

- 1.13 Main executive responsibilities for the road sector are carried out through the WSG. This unit, created in 2002 is responsible for the planning and management of road investments and maintenance activities. The WSG carries out all of its activities, and has provided engineering advice to the Regional Councils, the Airport Authority and the Central Tender Board.
- 1.14 The MPW&C has several line divisions dealing with different types of infrastructure. One of them, the Roads Administration Division (RAD), was responsible for the planning, engineering, construction supervision and operation and maintenance of public roads. The RAD has suffered in recent years from an acute shortage of staff and the statutory position of Chief Roads Officer has been vacant for a number of years. At present, there is only one qualified engineer in the unit who relies heavily on the WSG Highway Engineer for support in planning and coordinating the maintenance activities of the unit. The other functions i.e. planning, engineering and construction supervision of the rehabilitation of public roads were transferred and are now performed by the WSG. In coordination with WSG, the RAD is currently carrying out limited emergency maintenance works on city streets with an annual budget of US\$ 50,000.
- 1.15 The MPW&C includes the Central Transport Planning Unit (CTPU), responsible for core transport planning and establishing project priorities and consolidating budget proposals within the Ministry. This unit is responsible for planning, coordinating and regulating public transport although these functions are generally ignored. This unit has an acute shortage of staff and is currently staffed with just one person, the Chief Transport Planning Officer, and it cannot fulfill its mandate. The CTPU is mandated to control the development of the transport sector by integrating the investment proposals of the different sector agencies, to establish priorities among projects, and propose and review transport tariffs and other charges. The CTPU will be the coordinating agency for the implementation of the National Development Strategy as it relates to the transport sector as well as the IIRSA initiative, and the counterpart agency for the National Transport Study to be financed by the European Union. No funding was provided for the institutional strengthening of the CTPU within previous projects.

4. Moleson Creek – New Amsterdam Area

- 1.16 The 86 km New Amsterdam to Moleson Creek road forms a vital integration link with the ferry services to Rosignol and Suriname. The corridor is located fully

within the coastal plain, an area containing the highest concentration of residents in Region 6. This road serves a population of about 143,000 persons and agriculture communities with approximately 250,000 ha of rice, 70,000 ha of sugar, and important farming communities with two of the largest rice milling facilities in the country. Current levels of average daily traffic in the New Amsterdam area of the corridor were estimated to be of the order of 7,500 vehicles. Further east along the highway, average daily traffic volumes in the different segments identified were in the range of 5,000 to 6,000 vehicles. According to vehicle classifications 55% are private vehicles (cars, pick ups and motorcycles), 30% are public transportation vehicles and 15% are trucks.

- 1.17 The road, constructed more than forty years ago, has completed its useful life expectancy and need urgent rehabilitation works in order to minimize construction costs, improve highway safety and reduce road users' costs.

C. The country's sector strategy

- 1.18 The country's strategy in the transport sector aims at reducing transportation costs, improve market access and overall competitiveness, and increase coverage of main roads, bridges and other infrastructure by management contracts. The Program will increase competitiveness by reducing both users' costs and future reconstruction costs through rehabilitation and maintenance of part of the road network that has completed its economic life expectancy, and will improve safety of pedestrians and traveling public.

D. The Bank's sector strategy

- 1.19 The Bank's strategy in Guyana, expressed in the Country Paper (GN-2228), seeks to achieve medium-term poverty reduction through activities that will: (i) lead to sustainable economic growth; (ii) improve governance and public sector efficiency; and (iii) strengthen social programs. The program supports the objective of sustainable economic growth by improving critical transport infrastructure in one of the most important economic regions of Guyana. These improvements will reduce transport costs and increase market accessibility, reducing important barriers to increased productivity and creating a more attractive environment for private sector investment. By facilitating transportation, the program will increase the accessibility of essential social services to the Guyanese communities living in the surrounding areas. In terms of modernization of the public sector, the Program supports actions designed to increase the efficiency and effectiveness of the MPW&C, particularly through the institutional strengthening of both the CTPU and WSG

E. Regional Integration

- 1.20 The Initiative for the Integration of Regional Infrastructure in South America (IIRSA) emerged from the Meeting of South American Presidents held in the second half of 2000 in Brasilia, Brazil. Recognizing that joint actions were

necessary if their shared goal of integration was to be achieved, the Presidents of participating countries made a strong commitment to work together to modernize - and adopt specific measures to integrate- infrastructure in the region. IIRSA is based on the premise that the integration of physical infrastructure across national borders is a decisive factor in promoting production and trade capable of fostering sustained and sustainable growth in the countries of the region.

- 1.21 The integrated infrastructure development in South America is a priority in the Region. This implies not only the improvement of physical infrastructure (transportation, energy and telecommunications) but to conceive and integrate logistics platforms that harmonize and integrate markets, improvement of information systems and border regulation, development of Information and Communication Technology and other actions in logistics services. The articulation of the South American territory seeks to reduce the logistic cost of regional production and promotes the creation of regional – scale industrial, trade and service clusters.
- 1.22 As part of the results of the IIRSA Initiative, several Integration Development Hubs were identified, whose supporting infrastructure were outlined as mechanisms for territorial planning across the twelve countries. In the process, strategic projects have been identified and discussed with the countries under a regional overview.

- 1.23 The country of Guyana is part of the Guyanese Shield Hub, comprised of Venezuela, Guyana, Suriname and Brazil. The territory of this Hub is not currently articulated as a development hub, but it is divided into relatively isolated regions from each other and has varied development patterns. The lack of articulation of the territory takes the form of significant deficiencies in infrastructure that provides access to the large territories involved, and a lack of interconnection between the main centers of population and economic activity.



- 1.24 Since trade flows are still in the incipient stage, the formulation and analysis of structural infrastructure projects in this hub are subordinated to long-term territorial planning. In this aspect, a meeting with all the countries that conform the Hub was held under IIRSA, and the portfolio of projects for the Hub was

discussed and the projects were grouped under vertical and horizontal synergies. For each group, an anchor project, vital for the incorporation of the vertical and horizontal synergies of the group, was defined. For the case pertaining Guyana, the countries in the group identified the interconnection between Guyana – Suriname – French Guyana and Brazil as one of the main groups of integration groups of project and the improvement of the road between Georgetown and Albina as the anchor project.

- 1.25 The New Amsterdam - Moleson Creek Road solves a bottleneck in the anchor project of one of the principal groups of projects, and it will contribute to the integration of this Hub. In addition the program will support the Bank's overall strategy of promoting regional integration by improving the only land based link to neighboring Suriname as part of the Venezuela-Brazil-Guyana-Suriname hub within the IIRSA initiative

F. Bank Experience in the Sector

1. Road Rehabilitation Programs.

- 1.26 In the roads sub-sector, the Main Roads Rehabilitation Program (LO890/SF) was completed in 2002, and implementation of the Bridges Rehabilitation Program (LO-999/SF) with the creation of the WSG in 2002 reached 47% disbursement by March 2004 (35% by September 2003). The Bank approved, in November 2001, the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). Works started in May 2003 on various sections of the roadway with 29% disbursed by March 2004 (21% by September 2003). The weight control component of the program which intends to review existing weight limits and legislation with a view of bringing these on par with international standards, as well as finance the installation of permanent scales, is deferred for implementation in 2004 awaiting completion of ongoing rehabilitation and construction works and results of ongoing feasibility studies to identify final locations of scales. WSG is currently in the process of drafting bid documents for portable scales for mobile weight control and will commence procurement of fixed scales within the second semester of 2004.

Disbursement Rates (As at March 17, 2004)

Loan Number	Approval Date	Approved	1999	2000	2001	2002	2003	2004	Total Disbursed
LO-999/SF	25-Nov-97	41,000	1,649	234	746	5,127	9,893	1,627	19,275.50
LO-1094/SF	07-Nov-01	33,000	0	0	0	26	8,872	620	9,517.40

- 1.27 Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF) will also monitor the development and implementation of the RMMS financed by the bridge rehabilitation program, and currently in its final stages of implementation. The Project, supports cost reliability in terms of using performance based lump-sum

investment and maintenance contracts for contractors and supervisors, which restrict cost overruns and minimize delays.

2. Air Transport Reform Program.

- 1.28 The ongoing Air Transport Reform Program (LO-1042/SF) seeks to bring air transport in Guyana up to international (International Civil Aviation Organization - ICAO) standards, and to increase efficiency in the sector by introducing a commercial element into the operations of major airports, while providing for regulatory control. The Program is a hybrid operation with three components: i) a Policy Component (US\$20 million to be disbursed in two tranches) with elements tied to the adoption of a sectoral policy, regulatory and institutional reforms, and the introduction of private sector participation and commercial incentives in the operation of airlines and airport facilities; ii) an Investment Component to provide funding for improvements of the main runway to ICAO standards at the International Airport; iii) a technical cooperation for institutional strengthening.
- 1.29 The disbursement of the first tranche of the policy component, linked mainly to the drafting of a new regulatory-legal framework for the sector and the establishment of the new sector agencies, occurred in December 2002. The second tranche disbursement is conditioned by the completion of the corresponding conditions, depending primarily on the GOG's ability to set a sustainable financial structure for air transport and the completion and implementation of plans to ensure certification of priority interior airfields according to the new Aviation Regulation for Guyana. After some initial delays, related to late approval of the supervision services, the works on the runway have been completed adequately. Similarly, the TC component is progressing adequately. This Program is complemented with a Technical Cooperation financed through the MIF facility (ATN/MT-8602-GY), created to support investments and training in safety.

G. Other Donors Experience

- 1.30 Three other donors have been active in the road transportation sector, the World Bank, the European Union (EU) and the Caribbean Development Bank. The World Bank has disbursed US\$20 million of an Infrastructure Rehabilitation Project of US\$26 million. This project focused mainly on the rehabilitation of the Essequibo coast road and preventive maintenance of sea defenses. The EU, through the National Indicative Program, financed an Economic Infrastructure Rehabilitation Project of US\$25.9 million. The program included rehabilitation of sea defenses and the Demerara Harbor Bridge. The EU financed, through a Regional Program, the establishment of a ferry service between Suriname and Guyana, and this has resulted in an increase in traffic between the two countries, and consequently an increase in traffic along the New Amsterdam – Moleson Creek road segment. Additionally, the EU is preparing a comprehensive national transportation plan under the 9th European Development Fund. Its objectives are to provide a coherent and consistent policy and strategy for the development of

the transport sector over the next 12 years, to identify the requirements in the areas of policy, legislation, regulation, institutional arrangements, service provision and implementation for the sustainable growth of the sector. A key output of the study would be an indicative investment program consistent with the Government's anticipated financial capacity that will meet the demands for transport and support the social and economic development of the country. The Caribbean Development Bank (CDB) has fully disbursed its US\$20M for the rehabilitation of the Linden-Soesdyke highway and selected streets in the town of Linden. It has also recently approved a US\$19.1M operation to finance the upgrading of the heavily congested existing southern approach to the city of Georgetown from the Demerara Harbor Bridge, to a four-lane facility, and is financing the rehabilitation of the most heavily trafficked section of the West Demerara Highway from the Demerara Harbor Bridge to Vreed-en-Hoop.

H. Lessons Learned

- 1.31 Projects from all donors have faced major implementation delays and cost overruns. Implementation delays have resulted from the inability of the executing agency to meet conditions prior to loan disbursement, and an inability to conclude contract actions in a reasonable time. An important lesson learned is that a major source of delays and cost overruns was the fragmentation of contracts, as small contracts do not attract well-qualified bidders. Therefore, the road and structures construction works (and supervision) included in the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF) and in the Bridges Rehabilitation Program (LO-999/SF) have "bundled" construction activities into sufficiently large, partially or fully performance-based lump-sum contracts.
- 1.32 The creation in the Ministry of Public Works & Communication (PW&C) of a Work Services Group (WSG), which replaced a series of dedicated donor PEUs, has produced good results in the area of execution whilst lowering costs. The Government of Guyana is starting to recognize the value of this new model, and the health sector is considering a similar approach. An alternative model is also being tested in the education sector with positive initial results.
- 1.33 WSG concluded the first phase of routine maintenance works, including designs and bidding documents, and contracted out 85 Km. of roads with a performance based fixed price cost (G\$1.7). Ongoing IADB projects support sustainability of that program in terms of financing actual maintenance works through a 3-year contract with the private sector, while this program will continue the support of design and engineering services to expand the sustainable implementation throughout the paved network. In terms of financial sustainability, the GOG has committed itself to provide the expenditures required to achieve the minimum level of routine maintenance works determined by the RMMS.

I. Lump Sum Contracts

- 1.34 The execution of the cost plus Essequibo Road Project and the Main Roads

- Rehabilitation Program (LO890/SF), which included the Georgetown-Timehri and Georgetown-Mahaica Roads, encountered problems with claims and delays, resulting in increases in final costs and execution periods. The final cost of the Essequibo Road Project was 63% higher than the contract sum, and the execution period was seven years instead of the contractual agreement of two years. Due to claims by the contractor on issues concerned with price fluctuations, increased quantities and disputed measurements, the contract was terminated and went into litigation. A settlement was concluded without the road being completed. A second contractor took over construction and also ended up in litigation, claiming that promises made during the negotiation stage regarding control of quarrying operations for production of aggregates were not met and therefore the cost of aggregate supplied by the client was arbitrary set and too expensive. The project, completed by a third contractor, is currently in an ongoing litigation.
- 1.35 With respect to the Georgetown-Timehri and Georgetown-Mahaica Roads, part of the Main Road Rehabilitation Program (LO890/SF), the final cost was more than 30% higher than the contractual sum, and the execution period was, respectively, 17% and 100% higher than the expected contractual duration. These increases occurred because of price fluctuations being contractually allowed, increased scope of works and major redesign of activities.
- 1.36 Based on past experiences, lump sum contracts were introduced. It was intended that bidders would be required to conduct a thorough design review of all the plans and specifications before the submittal of their proposals, during the final negotiation with the selected contractor justified design errors are corrected and the selected contractor certifies that there are no errors or omissions in the contract documents and accepts all design conditions, adjusted quantities, specifications and drawings ahead of execution, and not be allowed claims for design errors or extra time. Currently there are three ongoing contracts (¶1.26 to ¶1.29) being executed under the lump sum modality: civil works and supervision of construction of Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), civil works of Bridges Rehabilitation Program (LO-999/SF), and Air Transport Reform Program (LO-1042/SF).
- 1.37 In the Bridges Rehabilitation Program ninety days were allowed, and in the case of the Mahaica Rosignol Road Rehabilitation Project, a period of sixty days was allowed for design review. In the first program no reimbursement was allowed to the successful bidder. Only two bidders were pre-qualified (the second ranked bidder did not submit the security bond and did not fulfill the pre-qualification requirements, therefore the process ended up with limited negotiation leverage), and both bidders expressed an unwillingness to accept geo-technical information and earthwork quantities, and a provisional sum was included for quantities in excess of the bid quantities. In the second program both the successful bidder and the second ranked bidder received a reimbursement for design review expenses.
- 1.38 In the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), the lack of coordination with the utility companies (mainly water services) arose as an

unforeseen issue. To minimize the effect of works being performed independently, WSG established a committee with the participation of the water company to provide information and exchange programs and schedules of works. Due to the positive results obtained, the continuation of this procedure is proposed in this program.

- 1.39 In the case of the Runway Rehabilitation of the Cheddi Jagan International Airport (CJIA), the actual cost of the works was 105 % of contract sum including additional works of taxiway rehabilitation and airside peripheral road paving, not included in the original contract. The contract duration was 17 weeks and the actual completion time was 23 weeks, mainly due to the late start of works that pushed the construction period into the rainy season (Contractor's claim that the works could not start on schedule because the supervision was not on board, was declined by both the supervision and the GOG).
- 1.40 The inclusion of a design review stage in the projects did not eliminate all design errors. The system as used is workable although there will still be design changes and amendments resulting in some quantity variations for which contingency sums should be allowed, due to changes of the road conditions, change of scope of works, insufficient engineering or environmental baseline data, errors or other omissions of the bidding documents. Since the contracts are in various stages of execution, only a preliminary assessment of the process is possible at this point. The major difficulties experienced in the execution of civil works were related to repairs recommended for structures and culverts that turned out to be heavily deteriorated and in need of complete replacement.
- 1.41 The contractor was allowed to propose alternative methods of construction or design changes, to effect savings, or to improve methods of construction. This procedure was further applied to cater for additional problems experienced during the execution stage. Additionally, some allowances had to be made for design changes and additional costs allowed for during Value Engineering procedures. In the case of the Bridges Rehabilitation Program, a review of construction methods and designs resulted in the elimination of the need for demolishing two existing large bridges, and therefore allowing for the construction of thirty additional structures without cost increase.
- 1.42 Lump sum contracts were recommended for these projects, though all design errors cannot be eliminated in the review process. In the ongoing projects, a number of adjustments prevailed, which could not be reasonably anticipated and additional work required has to be reimbursed from contingencies to maintain the original performance level of the project. The Value Engineering process was applied in this case. In the Mahaica Rosignol Road Rehabilitation Project, mobilization and unsatisfactory initial progress was experienced and ways to penalize the contractor for these lapses are being examined, since existing penalties are only related to delayed completion at the end of the project, and loosing the contract benchmarked and final bonuses.

II. THE PROGRAM

A. Objectives and description

- 2.1 The main objective of the project is to lower transport costs and reduce accident rates, improving access to an important agricultural zone and facilitate regional integration between Guyana and Suriname, within the IIRSA initiative, through the rehabilitation and improvement of the New Amsterdam-Moleson Creek road. Additional objectives include providing support for the institutional strengthening of the MPW&C especially in the areas of transport planning, project design, supervision and reporting and road safety, and the preparation of studies.
- 2.2 Expected results include reductions in generalized transport costs achieved by reductions in vehicle operating costs and reduced travel times. Road rehabilitation should also result in reduced future periodic road maintenance costs. Improved transport will increase accessibility of surrounding communities to markets and services. “Critical spot” interventions will reduce traffic related fatalities and injuries. Institutional strengthening activities will improve road asset management and assure better returns for road investments.

B. Program Structure

- 2.3 The Program consists of three main components, an institutional strengthening component for the MPW&C, an investment component for road works and a component including the feasibility study of the Demerara River Crossing, urban transport study for Georgetown and rural transportation studies.

1. Institutional Strengthening of the MPW&C (US\$ 3.05 million)

- 2.4 The institutional component will finance activities directed at further improving the institutional capacity of the MPW&C, based upon the institutional improvement plan developed under the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). Specific support will be provided to strengthen the MPW&C's capacity, through the CTPU, to evaluate and set transport policies, carry out transport planning and prioritize transport investment. This component will also provide support for the WSG, the specialized unit responsible for road system management and project execution, strengthening the implementation of its action plan.
- 2.5 Efforts will concentrate on improving MPW&C's capacity to plan and regulate public transport. This will be carried out through the strengthening of the CTPU and the WSG. Funds available in the Bridges Rehabilitation Program (LO-999/SF) were used to prepare a diagnostic of the current situation of the CTPU and an action plan for its strengthening, and to review the action plan used for the implementation of the WSG to ensure that it was implemented as intended, that it is still relevant to the WSG, that the goals and objectives have been achieved, and, on the basis of this review, update the Action Plan.

- 2.6 The CTPU's action plan outlines the strategy for its strengthening, presents an implementation plan, work program and functions, organizational structure, job descriptions, qualifications and a salary structure, and also establishes budget requirements. Since the functions of the CTPU are very closely aligned with those of the WSG, even overlapping in the areas of environmental impact assessment, traffic safety engineering studies and transport data management, it is recommended to establish the CTPU within WSG's structure, and the Chief Transport Planning Officer –head of the CTPU unit- will report directly to WSG's Coordinator. Furthermore, cost savings can be derived from having both units under the same organizational structure. This program will support the implementation of the recommended action plan.
- 2.7 Activities to be funded within this subcomponent include: i) expert consultancy to support the development of a computerized inter-modal transportation system planning and data management, including associated training, and assist in the formulation and preparation of a long term national transport investment plan and transport policy (\$320,000); ii) expert consultancy to support the evaluation and development of transport policies (\$150,000); iii) inter institutional and inter disciplinary coordination, including the development and implementation of training programs (\$150,000), iv) expert support in planning of conceptual urban transport plans for main cities (\$100,000), v) expert support in administration of regulating public transportation (\$30,000), and vi) computer equipment and software (\$50,000). Counterpart resources will finance: i) all local staff salaries in the CTPU: Chief Transport Planning Officer (incumbent), Transport Planning Officer, Economist Planning Officer, and Planning Assistant; and ii) other set up and operating costs such as electricity, telephone, office materials, etc.
- 2.8 In the case of the WSG, the development plan prepared under LO-1094/SF was reviewed, to ensure that it was implemented as intended. On the basis of this review, the action plan was updated, and fulfillment of existing vacancies (Highway Engineer, Contracts / Procurement Specialist, and Materials Engineer) was recommended as well as the development of specified required consultancies. The program will support the ongoing financing of the WSG between the moment that the assigned resources under LO-1094/SF are exhausted until the end of the disbursement period of this program. It is estimated that this is a one year period. The project also includes an environmental training of MPW&C and WSG staff and construction contractor's personnel.
- 2.9 Activities to be funded within this subcomponent include: i) support the road safety unit providing traffic modeling software and training to establish the road network in GIS format and linked with the Micro Computer Accident Analysis Package being developed under the Bridges Rehabilitation Program (LO-999/SF) (\$330,000); ii) review the RMMS to suggest amendments and updates based on lessons learnt, and assess road condition changes overtime (\$150,000), iii) expert consultancy support for the monitoring of the lump-sum investment and maintenance contracts (\$100,000); iv) expert consultancy for quality control procedures (\$70,000), v) expert consultancy to support the institutional quality

assurance procedure of the WSG (\$30,000) , vi) expert consultancy for social/environmental monitoring, supervision, management and conservation of investment and maintenance projects (\$70,000). Counterpart resources will continue to finance: i) local staff salaries in the WSG as defined before (§ 2.9); and ii) other additional operating costs such as electricity, telephone, office materials, etc.

2. New Amsterdam-Moleson Creek road rehabilitation (US\$ 32.8 million)

- 2.10 The investment component provides funds for: (1) the rehabilitation of the 2-lane 81 km New Amsterdam to Crabwood Creek Road (NACCR) and the improvement of the 5-km road from Crabwood Creek to Moleson Creek, located on the Corentyne river, the border between Guyana and Suriname; (2) the rehabilitation of related bridges and drainage structures; and (3) the improvement of “critical spots” (i.e., unsafe road locations with high accident rates). This road investment component will complete the planned improvement of the eastern Atlantic shore road system that commenced with the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF). This corridor connects Georgetown to the major population centers along the Atlantic coast and provides the only land transport link between the important coastal belt of Guyana and Suriname.
- 2.11 Constructed in the late 1960s, some sections of the road have subsequently received a surface seal in previous maintenance/repair interventions. However, much of the existing roadway surface now exhibits extensive block cracking (in some cases these have degenerated into potholes), indicative of asphalt in a brittle state and approaching the end of its useful life as a wearing course. Tests have indicated however, that there is generally no differential movement between adjacent “blocks” and that the distress does not extend into the sub-layers. The appropriate treatment has therefore been judged to be crack sealing and asphalt overlay. Between 5 to 10% of the length of the route features alligator and other types of crack manifestations, indication of deeper based distress. In those locations, full depth reconstruction is deemed to be required.
- 2.12 The level of intervention now needed on the New Amsterdam-Moleson Creek road has been determined during the feasibility study stage of this project carried out in 2003. Based on the findings of that study, full depth reconstruction is required only in localized areas with crack sealing and asphalt overlay being required over the majority of the route. Other investments will be targeted at restoring the integrity of much of the aging bridge and culvert inventory and in improving road safety. The roadway surface will be designed to provide an effective life expectancy of 10 years before a new intervention would again be warranted. However, major bridge and drainage structures will be replaced or rehabilitated as required to insure that they can remain in service without significant rehabilitation, for a minimum of another 15 years. To ensure sustainability of future road maintenance, the Loan Document will specify that GOG is committed to ensure that the works included in the project be adequately maintained, providing at least the required annual expenditures, by means of the

national budget, to meet the minimum standards determined annually by the RMMS.

- 2.13 Limited regional classified traffic and axle load survey data was made available by the MPW&C for the Corentyne Highway from the year 2000. Supplementary counts were conducted in September and October of 2003 as part of the feasibility study preparation work, and they, though higher, were found to correlate quite well. Current levels of average daily traffic in the New Amsterdam area of the corridor were estimated to be of the order of 7,500 vehicles. Further east along the highway, average daily traffic volumes in the different segments identified were in the range of 5,000 to 6,000 on average.
- 2.14 Axle load surveys were performed to determine average axle weight and gross vehicle weight for 2, 3 and 4-axle trucks. The data indicates that the critical load of the single axle dual wheel truck (80% of the total number of trucks) is within 5% of the legal limit. Additionally, the 3 and 4-axle trucks represent less than 1% of the total number of vehicles, and only in one case, while carrying a special cargo, the axle weight was above the legal limit. However, the legal limit of 8,2 tons for single axle dual wheel is conservative, being at least 20% lower than allowable axle load in other countries.
- 2.15 The Corentyne Highway is conceived to be a connecting link between the ferry terminal in New Amsterdam with that at Moleson Creek. As such the route that is the subject of the Program is comprised of the following geographical sections:

Section	Direction of Traffic Flow	Length (km)
Stelling Access Road, New Amsterdam	2-way	0.25
Water Street, New Amsterdam	2-way	0.25
Esplanade Road, New Amsterdam (northbound)	1-way	0.80
Princess Elizabeth Road, New Amsterdam (southbound)	1-way	0.55
(Vryheid Road) ¹	(2-way)	(0.25)
Corentyne Highway (New Amsterdam - Crabwood Creek)	2-way	80.5
Stelling Access Road (Crabwood Creek - Moleson Creek)	2-way	5.40

- 2.16 A full range of inspections and tests were carried out along all sections of the route in order to determine the residual strength of the pavement layers and the support strength of the sub-grade materials below. This work included i) visual condition assessments including measurement of crack and pothole extent and severity, frequency and depth of edge breaks, etc.; ii) trial pits and analysis of recovered samples; iii) Dynamic Cone Penetrometer testing; iv) peak deflection testing; v) radius of curvature and deflection bowl measurement; vi) crack activity assessment; and vii) rut depth measurement.

¹ This link is not included in the Project, but will be completed under the 2004 Urban Development Program

- 2.17 From this assessment it was observed that much of the existing asphalt was of significant thickness and thereby represented a considerable “asset value”. As such it should be retained as far as possible. Proposed interventions of rehabilitation and reconstruction were then developed based on the above observations and analysis together with predictions of lifetime axle loads.
- 2.18 Rehabilitation is proposed for sections of roadway (approximately 86.6 km) where existing strength is adequate and distress is limited to surface cracking with no differential movement. The works planned include sealing of map cracks with a bitumen-based slurry, repair of edge damage and potholes with a subsequent application of an asphalt overlay. An asphalt leveling / regulating course is also proposed for areas where rut depth is greater than about 8 to 10 mm and/or super-elevation rates are deficient. Reconstruction is proposed in those segments (approximately 1.1 km) where present distress is significant and to a degree where replacement of the full depth pavement structure is warranted.
- 2.19 Based on the design details and on derived unit prices, estimates of construction costs for the road works part of the project were compiled considering site clearance, excavation and ditching, base and sub-base repair, pavement repairs, surfacing and utilities. The estimated total cost is US\$ 14,90 million.
- 2.20 A number of inspections and tests were carried out for each structure located along the route in order to determine present conditions and to estimate the remaining life span before replacement or major reconstruction becomes necessary. Field activities included: i) determination of location and function of each structure; ii) recording of dimensions for each bridge, box culvert and pipe culvert; iii) physical testing of materials (e.g. by means of Cover meter, Schmidt hammer, and Half-cell test equipment); and iv) determination of extraneous environmental influences (e.g. sulphate content of water, chloride content of concrete and degree of carbonation).
- 2.21 Design was done in order to assure a minimum 15-year residual service life for each structure before the next major rehabilitation effort is required, focusing on assessment of theoretical load carrying capacities and categorization of necessary remedial works for each structure type by extent of intervention in such categories as full replacement, major repair, minor repair and “no structural work”. The analyses resulted in the following list of interventions for the 103 structures contained in the corridor.

Type of Structure	Replacement	Major Repair	Minor Repair	No structural work	Total
Bridge – Conc.	17	1	1	1	20
Bridge - Steel	-	1	3	-	4
Box Culvert	13	29	21	1	64
Pipe Culvert	1	11	2	1	15
Total	31	42	27	3	103

- 2.22 Based on the design details and on derived unit prices, the estimated construction cost for the structural works is US\$ 12,75 million.
- 2.23 Several factors give cause for concern in terms of road users' safety along the corridor. These include the presence of non-motorized vehicles, stray animals and lane obstructions (e.g. building materials and the drying of rice crops) as well as significant pedestrian traffic volumes. The latter associated with the many commercial and institutional areas along the route. The flat terrain and straight alignment of the existing road leads to high vehicle speeds and to significant speed differentials between through traffic and other road users.
- 2.24 In an attempt to reduce the incidence of road accidents in the post-construction phase, a range of treatments is to be introduced. These include the provision of extensive paved shoulders with appropriate lane edge demarcation throughout much of the corridor. Additionally, parking lanes in areas having significant parking and/or stopping demand and the installation of raised sidewalks where pedestrian activity is greatest, new or improved street lighting and signage will be provided. Improvements along urban critical sections includes road marking, signing, lighting, sidewalks, bus stops, identification of School Zones, additional parking lanes, and school and pedestrian crossings and their signalization. All of these elements are considered essential in the interests of providing a safer environment for road users.
- 2.25 The provision of all-weather concrete or asphalt-surfaced sidewalks is recommended along 3.9 km., on a non-continuous basis, where pedestrian activities are greater. Generally, these will be of 1.5 to 2.0 meter width and raised above adjacent shoulder surfaces by means of a low, barrier type curb. Curb depressions will be required at each of the frequent property access points.
- 2.26 Subject to the availability of existing right of way (no additional land is to be acquired), 18.8 km of surfaced parking lanes will be provided in areas where parked and/or stopping traffic volumes are significant. The desirable width of these lanes will be 2.4 meters with a minimum of 2.0 meters where areas are constrained by existing development.
- 2.27 Street lighting is notably deficient along the roadway. Some of the more urbanized areas have some coverage though its effectiveness is questionable. The minimum coverage of new or improved lightning will be 18.8 km.
- 2.28 Additional safety measures selectively introduced may include transverse speed "humps", longitudinal and transverse "rumble strips" raised pavement markers (RPMs) and appropriate edge and lane delineation as well as conventional and standard signage - regulatory, advisory and directional types.
- 2.29 Based on the safety requirements and derived unit prices, estimated of construction cost for the safety measures of the project is US\$ 2.65 million.

- 2.30 The final cost estimate at the feasibility study stage for the physical rehabilitation works is US\$ 30.3 million, including an allowance of US\$ 1.0 million for the 3-years of routine maintenance that will be financed through the local counterpart.

3. Studies and preparation of designs (US\$ 2.30 million)

- 2.31 **Feasibility Study of the Demerara River Crossing.** The objective of this study is to conduct an evaluation of the Demerara River Crossing based on technical, economic social and environmental analysis of different alternatives to estimate its economic costs and benefits and determine the economic and financial viability. The Demerara Harbour Bridge, a toll bridge crossing the Demerara River, is a major integration link between the East and West Demerara areas. It is a steel pontoon floating bridge with 7.2 m. of two-lane carriageway, 1.2 m. wide pedestrian sidewalk, and no proper collision protection. The length of the bridge is 1850m, and consists of 61 spans supported by floating piers. The bridge, constructed in 1978, was designed to last for 10 years, major rehabilitation works were completed in 1995, at a cost of US\$ 9.0 million, that extended the bridge's life by 15 years, coming to an end in 2010. An average of 8,400 vehicles cross the bridge per day. The bridge is retracted once a day for one and a half hours, causing major delays and congestion. At present the annual operation cost totals US\$ 1.1 million, and the revenues are US\$ 1 million. The revenues to be collected cannot offset the cost of the next maintenance major activities, scheduled for 2007. A feasibility study and an Environmental Impact Assessment will be undertaken for a new crossing across the Demerara River; its location will be selected based on technical, economic and environmental analysis of different alternatives; an analysis for a DBOT, or other arrangements involving private sector participation will be included.
- 2.32 **Urban transport study for Georgetown.** In April 2003 the GoG commissioned a study that evaluated the arterial road system and the public transport needs in the city of Georgetown and its metropolitan area. This study has concluded that the current urban transportation services and the urban road network of Georgetown cannot support the increasing demand, and will become unsafe and costly for the users. The current urban traffic conditions will worsen when the ongoing widening of the existing southern approach to Georgetown (construction of two additional lanes between the city and the Demerara Bridge) will be completed in 2005. Therefore, it is urgent to carry out a transportation study, focusing mainly on existing entry and access routes, traffic flow and management, safety, and institutional aspects, with the following principal components: i) policy and institutional strengthening, and ii) traffic management and road safety improvements. The first component will evaluate and prioritize the requirements in the institutional, legal, regulatory, and infrastructure (traffic management, safety, environment, etc.) areas. The second component, and complementary to the first one, will develop traffic regulations and control procedures, public transportation plans, and final designs of solutions to ease traffic congestion and improve road safety through improvements in the capacity of the urban road system, upgrading intersections, changing traffic flows, etc.

- 2.33 **Rural Transportation.** Several studies, preparatory of the rural transportation program (GY-0074), will be developed under this subcomponent, including: i) diagnostic of rural transport: transport modes, affected population, beneficiaries, transport costs, transport services provided for freight and passengers, impact upon production and means of subsistence; ii) development of a planning system that will allow identification in investment priorities, giving fundamental importance to users, beneficiaries and local authorities' participation in the identification process; iii) preparation of technical, environmental and social basic standards for the planning and execution of a rural transport program. These standards will expand during the execution process; iv) engineering designs for rehabilitation of rural roads, small docks, and other rural transportation infrastructure; v) development of methodologies that will allow sustainable management (operation and maintenance) of the rehabilitated infrastructure and related services. The participation of the communities and local governments in the financing of maintenance will be of particular importance; and vi) preparation of the baseline that will allow the measurement of social and economic impacts of the rural transport improvement.

C. Cost and financing

- 2.34 Project costs, in thousands of dollars, are summarized in the table below:

	Bank	GOG	Total
Institutional Strengthening	1,550	1,500	3,050
CTPU	800	550	1,350
WSG	750	950	1,700
Civil works and supervisory consultancy	30,850	1,950	32,800
Moleson Creek – New Amsterdam Road	28,350	1,950	30,300
Works Supervision	2,500	0	2,500
Studies	1,800	500	2,300
Feasibility study Demerara River Crossing	400	200	600
Urban Transport Study for Georgetown	800	200	1,000
Rural Transportation	600	100	700
Evaluation	350	0	350
Audits	350	0	350
Financial Expenditures	773	200	973
Interests	400	0	400
Commitment Fee	0	200	200
Inspection and Supervision	373	0	373
Contingencies	1,627	0	1,627
TOTAL	37,300	4,150	41,450
Percent	90%	10%	100%

III. PROGRAM EXECUTION

A. The borrower and executing agency

- 3.1 The borrower is the Government of the Cooperative Republic of Guyana (GOG). The executing agency is the Ministry of Public Works and Communications (MPW&C). Project implementation will be the direct responsibility of the WSG.

B. Institutional structure of the executing agency

- 3.2 WSG's primary responsibilities include the execution of two IDB loan contracts (Bridges Rehabilitation Program (LO-999/SF) and Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF)), as well as other miscellaneous assignments related to right-of-way works, in-house designs for forced account works, and lending general engineering advice and support to other Government agencies responsible for infrastructure projects.
- 3.3 The unit is currently staffed in accordance with its organizational chart depicting key engineering positions, as contained in the Action Plan for its implementation, except for the highways engineer, the materials engineer and the Contracts / Procurement Specialist, positions that are vacant. Support staff is adequate and three office engineers provide key support to senior engineers. By the time New Amsterdam to Moleson Creek Project comes on stream, WSG shall be fully staffed, and the CTPU shall be fully incorporated and operational within WSG's structure.
- 3.4 In spite of the existing vacancies, the current deployment of responsibilities is adequate and all assignments are being executed. During 2003, WSG was able to meet all disbursement targets and there are no major issues with regards to any of the component of the two loans contracts under execution.
- 3.5 WSG will be responsible for the implementation of the Project. WSG will monitor the activities of the engineering supervision firm, and will maintain adequate accounting and financial controls, and appropriate support documentation filing systems. WSG will also prepare and submit to the Bank the disbursement requests and the corresponding justification of expenses, financial reports, and the annual audited financial statements. WSG will also act on behalf of the borrower in such matters as contractor claims and related contract adjustments to preserve the design level of service.

C. Engineering Supervision

- 3.6 The contractor who will carry out the civil works for the rehabilitation of the New Amsterdam – Moleson Creek road will be overseen by an engineering supervision firm hired under lump-sum contract services by the WSG with project funds, in accordance with terms of reference agreed with the Bank and using ICB

procedures. This firm will also carry out the supervision of the environmental aspects of the civil work. The firm will have the direct responsibility to:

- a. familiarize itself with designs,
 - b. if the conditions of the road have been changed, or if there are other technical justifications, make minor adjustments in the contract before award is made,
 - c. establish appropriate inspection, quality assurance / quality control procedures to ensure adequate administration of the lump sum construction contract, and ensure that environmental and social concerns are addressed fully by the contractor,
 - d. approve civil works contract invoices and submit them to the GOG, and
 - e. data gathering (traffic counts and axle load distribution in four selected fixed locations) for evaluation of the program.
- 3.7 The firm will also review all technical documentation at the beginning of its contract and at regular intervals throughout the project to ensure, *inter alia* the adequacy of the programming of work such as geotechnical and subsurface investigation, drainage, environmental specifications and mitigation measures, and worker safety recommendations. The firm will also confirm that contractor qualifications and equipment capacity satisfy design requirements.
- 3.8 The firm will submit, twice per year, reports to the Executing Agency and the Bank outlining progress compared with the Project Monitoring Checklist in Annex 3. The supervisory firm will also prepare as-built drawings (they will also be submitted in digital format) for all work performed upon the completion of each major work component. It is recommended that this firm be hired prior to completing contractor pre-qualification to ensure adequate supervision over the process and to avoid unnecessary claims.

D. Bank experience with lump sum contracts for road rehabilitation

- 3.9 Previous cost-plus contracts in Guyana have transferred most or all of the risk to the public sector. Therefore the WSG has implemented the performance based lump-sum modality for road and bridge construction and supervision (¶1.27 and ¶1.34 to ¶1.42). Lump-sum highway rehabilitation and maintenance bidding procedures are most common in developed countries. These procedures have been designed and implemented on recent Bank projects in Ecuador, (1138/OC-EC) and (1057/OC-EC), with success in terms of significant cost reduction of over 50% while keeping equitable and affordable quality of road services. The Guyanese experience with this construction and supervision contract modality includes the airside rehabilitation of the Cheddi Jagan International Airport, completed according to contractual budget and timetable constraints as part of the Air Transport Reform Program (LO-1042/SF), and the Mahaica-Rosignol

rehabilitation works currently under implementation. The Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF) includes the tools to evaluate the results of using lump-sum contracts in Guyana. Among them, an ex post evaluation designed to improve the collaboration among all stakeholders and to improve cost reliability and cost effectiveness of road and bridge investment and maintenance projects.

E. Contracting for the Civil Works

- 3.10 Taking into account the lessons learnt and the previous experiences with lump sum contracts, the Project Team considers that contracting the civil works at New Amsterdam – Molsen Creek using lump sum procedures is feasible and advisable for the following reasons:
- a. the lump sum contract provides the incentives and encourages teamwork of all stakeholders, specially the contractor and the supervisor, to implement effectively the technical designs and their quality control procedures in terms of eliminating unwarranted construction claims and implementation delays, thus reducing the total cost overrun risks,
 - b. the lump sum contract will shift a significant part of the reduced cost overrun risk to the agent (construction firm) that has a greater ability to manage and control that risk,
 - c. the lump sum contract includes specific bonuses, penalty clauses and performance warranties until the conclusion of the 3-year maintenance responsibility,
 - d. the road foundation has been in place for more than 40 years, so its characteristics are well known and therefore the risks that there will be a need to carry out unforeseen civil works are very low,
 - e. the engineering consulting firm that carried out the feasibility study and design for the civil works at New Amsterdam – Moleson Creek used non-destructive techniques to assess the actual condition of the pavement and its foundations throughout the entire length of the road. As a result, it is very unlikely that there will be unforeseen costs because of foundation factors,
 - f. the engineering consulting firm is highly experienced in the design of lump sum contracts and has defined very precisely the work that needs to be carried out,
 - g. the bidding documents for the civil works contract have been designed using best practices from developed and developing countries, and

- h. the engineering firm that will be selected to supervise the construction firm will have to demonstrate that it has experience in the supervision of lump sum contracts.

F. Project Oversight

- 3.11 An Engineering supervision firm will be hired using project fund to supervise the construction firm. During the first year of implementation of the physical works, review meetings will be held at least monthly among representatives of the Bank, the WSG and the supervisory firm to oversee the advance of the Project. Depending on the level of progress during the first year, the periodicity of meetings may be reduced.

G. Procurement of goods and services

- 3.12 In procuring goods and services financed by the Bank, the Executing Agency will follow Bank procurement policies and procedures. The Executing Agency will use international competitive biddings for all goods and services valued at more than US\$ 250,000, for civil works valued at more than US\$ 1.0 million, and for consulting services in excess of US\$ 200,000. All bank-financed civil works (rehabilitation of Moleson Creek – New Amsterdam Road) will be let in one package to pre-qualified firms.
- 3.13 To avoid delays in project implementation, the MPW&C has initiated the procurement of Program works and services prior to Loan approval by advertising for expressions of interest in the UN Development Business. In all cases these procedures have carefully followed all Bank procurement procedures.

H. Execution and disbursement schedule

- 3.14 Considering the scope of works that have to be done, the expected execution period of this Program is 54 months, while the disbursement period is 60 months.

I. External Auditing

- 3.15 During the project execution, the Executing Agency will prepare and submit annual financial statements regarding the use of the Program's funds. As a result of an evaluation carried out by the Bank's Disbursements and Audits Office (ROS/DAU) from May 12 to 21, 2003, operations approved after January 16, 2004 financed by the Bank in Guyana will be subject to auditing performed by a firm of independent public accountants (private audit firms) acceptable to the Bank, selected and hired by the Borrower according to Bank policies and procedures. These financial statements will be submitted within one hundred and twenty (120) days after the closing date of each fiscal year. Additionally, the Executing Agency will prepare a final financial statement, to be submitted within one hundred and twenty (120) days after the last disbursement of the project.

J. Annual Maintenance Report

- 3.16 The baseline road condition is included in the final design of the road, and will be transferred to the RMMS. During the 3 years following the rehabilitation of the road, when the contractor remains responsible for the maintenance, the MPW&C, through the WSG, will present to the Bank an annual report of routine maintenance works performed using the reporting procedure capabilities of the RMMS. This reporting procedure will continue until the end of the maintenance commitment period agreed upon between the Bank and the GOG.
- 3.17 The annual report corresponding to the activities carried out during each year, will be submitted within the first quarter of the following year, and will contain, at least, the following elements: (i) general information about the structure and responsibility of the firm responsible of the road maintenance, (ii) actual works carried out on a monthly basis, with a detailed description of quantities and availability of labor, materials and equipment, number and qualifications of labor (skilled and unskilled) actually employed, average monthly road conditions and its compliance with the routine maintenance contract and detailed unit costs and budget compliance; (iii) updated inventory of the condition of the rehabilitated road at the end of the year; (iv) evaluation of the maintenance plan of the previous year; and (v) maintenance plan for the following year, with the justification of the type of activities, schedule of works, identified priorities and physical (labor, equipment and materials) and financial requirements.

K. Loan Conditionalities

- 3.18 Prior to first disbursement of the loan, the Executing Agency shall be subject to the fulfillment, to the satisfaction of the Bank, of the following requirements: a) the Central Transport Planning Unit (CTPU) is fully staffed (Chief Transport Planning Officer, Transport Planning Officer, Transport Economist and Planning Technician have been hired) with commitments for at least the first year of Project execution (¶ 2.7); b) the CTPU has prepared a first year work program for land, river and air modes of transportation and has an approved budget that includes the counterpart funds necessary for the first year of execution (¶ 2.7); c) the terms of reference for the required studies and/or consultants for both the CTPU and WSG have been drafted (¶ 2.7 and ¶ 2.9); d) the WSG is fully staffed (Highway Engineer, Contracts / Procurement Specialist, and Materials Engineer have been hired) (¶ 2.8); e) an external auditing firm of independent public accountants have been hired by the Borrower in accordance with Bank Policies and Procedures for the hiring of independent auditing firms (¶ 3.15); and f) evidence that the CTPU and WSG have been merged into a single coordinated Unit of the MPW&C (¶ 2.6).
- 3.19 Prior to tender documents approval, the Executing Agency will incorporate as part of these documents a) the EMP including its mitigation, management, supervision, monitoring and training provisions, as well as the attachment containing the General and Particular Environmental Specifications (¶ 4.27), and

b) the requirement that the Contractor hires an Environmental Manager, and the supervision firm hires an Environmental Inspector as part of their field personnel (§ 4.28).

- 3.20 At least one month prior to requesting the Bank's no-objection on the final version of the Bidding Documents and Request for Proposals from the pre-qualified civil works contractors, the Borrower shall present to the satisfaction of the Bank evidence that the Engineering Supervisory firm for the Civil Works Component has been hired to review and evaluate such Bidding Documents and Request for Proposals (§ 3.6).

L. Evaluations

- 3.21 As part of the continuous evaluation of the implementation of the physical works, twice a year, during a period of 7 days (at least during fourteen hours per day) traffic counts and axle load distribution will be carried out in four selected fixed locations. These count will take into account low and high agricultural seasons. In addition, every second Wednesday of each month, traffic counts and axle load distribution will be carried out during the full day, in the same four selected fixed locations. These data will be collected by the supervision firm, and will be submitted to the Bank twice a year, in correspondence with the semi-annual reports.
- 3.22 A mid-term review will be carried out 2.5 years after the start of the program, or when the disbursement of the physical works has achieved 40%. Additionally, a final review will be carried out when the disbursement of the loan has achieved 90%. The scope of these evaluations will be: a) initial results of the rehabilitation and maintenance of the road; b) procurement procedures and results for goods, services, consultancies and civil works; and c) procedures and results in institutional strengthening area.
- 3.23 WSG will collect, store and retain all necessary information, indicators and parameters, including the annual plans, the mid-term review, and final evaluations, to help: i) the Bank to prepare the PCR; and ii) the Bank's Oversight Evaluation Office (OVE), if so wishes, to evaluate the impact of this operation in accordance to GN-2254-5.

IV. VIABILITY AND RISKS

A. Feasibility summary

- 4.1 The Project Team has reviewed all available information regarding the Project and concludes that there are no known technical, environmental, financial or socio-economic obstacles to proper implementation. The strengthening of the WSG and the CTPU is expected to significantly improve the institutional weaknesses detected in the Executing Agency. To the fullest extent possible, the Project Team has attempted to anticipate issues and ensure that they have been considered in designing the Project so as to maximize benefits accruing and reduce unexpected costs to a reasonable minimum.

B. Institutional viability

- 4.2 The Project Team considers that based on WSG experience and performance, the Executing Agency can implement the Project as described in this document. The WSG will receive technical assistance and training through the institutional strengthening component included in this Project. Furthermore, an engineering consulting firm will be responsible for supervising the civil works component.

C. Technical viability

- 4.3 The technical feasibility of the Project has been established on the basis of the Project Team's review of the studies, designs and specifications to verify that they meet relevant engineering standards. Considerations related to proper environmental management and provisions for foreseeable forces of nature have been incorporated into designs and construction specifications. The bidding documents and the construction contract include the environmental guidelines and mitigation measures set forth in the Environmental Study, as well as all principal engineering studies, soils, materials, pavements, drainage, and structures.
- 4.4 The budget includes funds for contracting an internationally reputable supervisory firm to supplement local expertise in managing projects of this scope in order to ensure the technical capacity and experience necessary for timely Project execution.
- 4.5 The execution schedule takes into account previous experiences from the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), the nature of the works to be financed, and the amount of time required to carry out the bidding process. It is the opinion of the Project Team that the schedule is realistic so long as sufficient resources are assigned from the GOG budget. It is important to note that the MPW&C has already begun the process of obtaining expressions of interest from international firms for some of the key components of the Program.
- 4.6 The project design included the use of sophisticated techniques of non-destructive testing needed to determine the engineering characteristics of the existing road

structure. These procedures were utilized to maximize the use of the existing pavement in order to minimize waste disposal, and to minimize construction quantities of new materials and therefore reducing Project costs.

- 4.7 To achieve a cost-effective, safer and affordable project, the rehabilitation of the New Amsterdam – Moleson Creek road was designed to a standard of 3.5 meters basic paved lane width with an economic life expectancy of 10 years, 3.25 meters turning lane width, 2.5 meter parking lane width, 2.0 meters of shoulders width, 1.5 to 2.0 meters of sidewalk within the urban areas, and a minimum cross slope of 2.0 % in order to ensure proper surface drainage. In addition, the interurban design speed is 80 km/h with a reduction to 60 km/h design speed in the urban areas.
- 4.8 The current condition of the 103 structures, 24 bridges and 79 culverts, located along the road was evaluated and an action plan was developed. This action plan consists of 31 replacements, 42 structures requiring repairs, 27 structures needing minor repairs and 3 structures that do not require structural work. The works to be performed will assure a minimum residual service life of 15 years before major rehabilitation works are required.
- 4.9 The Project Team evaluated alternative design and associated cost estimates before selecting the above referenced life spans. The resulting level of investment required to introduce those design measures was found to be both feasible, and robust in terms of sensitivity to possible variations in growth rates and construction costs. The final cost estimate at the feasibility study stage for the physical rehabilitation works is US\$ 30.3 million, including an allowance of US\$ 1.0 million for the 3-years of routine maintenance. Reference costs will be included in the bidding documents.

D. Economic viability

- 4.10 New Amsterdam - Moleson Creek road gives access to the important agricultural region between the Berbice and Corentyne Rivers, along the Atlantic coast, to the city of New Amsterdam, the second largest in the country, and improves regional integration with Suriname within the IIRSA initiative. Because of the poor state of the road, unless this rehabilitation is carried out soon, it is certain that major expenses will have to be incurred to bring the road back to an adequate standard.
- 4.11 Positive benefits will result from the provision of pedestrian crossings, proper street lighting, warning signs and reduced speed zones, protected sidewalks in public spaces, paved shoulders, and a reduction of number and severity of accidents involving pedestrians.
- 4.12 The excavation and re-establishment of drainage canals and culverts will improve drainage both locally and regionally and should reduce local pounding and flooding of adjacent agricultural and residential properties.

- 4.13 Negative impacts related to the construction phase of the New Amsterdam – Moleson Creek Project will be temporary, of small magnitude and localized to construction areas, with potential impacts avoided or attenuated through efficient application of environmental management specifications to be included in construction contracts. Since this is an existing paved road, indirect negative impacts related to human activities (i.e., changes in land use, deforestation, etc.), are not expected. No properties will be expropriated nor persons, residents or business resettled or relocated.
- 4.14 For the economic analysis, the New Amsterdam – Moleson Creek road was divided into 18 segments that are homogeneous with respect to traffic, pavement roughness and distress. Daily traffic counts were seasonally adjusted using available traffic data from LO-1094/SF to take into account variations between dry and rainy seasons. The determination of benefits, feasibility and sensitivity analyses were carried out considering the resulting annual average daily traffic figures. Using the Net Present Value (NPV) and Agency Costs criteria, the optimal rehabilitation strategy was defined. The Internal Rate of Return (IRR) shows that rehabilitating the road is economically feasible.
- 4.15 The direct total financial construction cost without contingencies for the project used in the economic analysis is US\$ 30.3 million. This cost includes the cost for the reconstruction/rehabilitation of 79 culverts and 24 bridges.
- 4.16 This cost includes improvements on highway safety elements. Based on a safety study carried out by WSG the following accident rates were adopted for the New Amsterdam - Moleson Creek route for the base alternative: 30 fatal, 60 injury and 300 damage-only accidents per 100 million veh-km traveled. These accidents are mainly classified as either run off the road (one vehicle accident), vehicle to vehicle collision or vehicle to pedestrian / cyclist collision. Widening of the pavement together with widening and paving of the shoulders and road lighting are among the most cost-effective measures of improving road safety. In addition, to further improve the highway safety along the New Amsterdam – Moleson Creek Road, the project will finance new road signage and surface rumble strips to encourage speed reductions within restricted speed zones. In the development of project alternatives, it has been assumed that accident rates will be reduce by 20% down to 24 fatal, 48 injury and 240 damage only accidents per 100 million veh-km traveled. HDM-4 indicated a reduction in accident costs over the 20-year analysis period of US\$ 24.83 million (undiscounted) and US\$8.16 million (discounted).
- 4.17 The proposed geometric design also incorporates chevrons on sharp curves, pavement markings and raised reflectors, advanced curve warnings, identification of School Zones, additional parking lanes and road lighting in priority areas. The total cost of improving highway safety on the New Amsterdam – Moleson Creek road is estimated at US\$ 1.32 million.

- 4.18 The economic analysis of the physical works, including safety measures, using the HDM-4 program, shows that the IRR is 33.7% and the NPV, using a discount rate of 12%, is approximately US\$ 83.63 million (assuming 20% reduction in accidents per 100 million veh-km traveled). The IRR without consideration of benefits due to accident reduction and with safety measure costs included is 31.3 % with the corresponding NPV of US\$ 75.47 million. The IRR excluding both benefits due to accident reduction and safety measure costs is 31.9% with the corresponding NPV of US\$ 76.30 million.
- 4.19 The economic indicators of this analysis, in terms of the impact of a possible construction cost increase and users' benefits decrease (sensitivity analysis) on the IRR and the NPV are shown in the table below.

Economic sensitivity analysis (economic values)				
	IRR (%)	NPV (US\$ MM)	Cost (US\$ MM)	Benefits ² (US\$ MM)
Base estimate including safety costs and benefits	33.7	83.63	30.3	110.5
Cost increase (100%)	27.9	74.72	60.5	110.5
Benefits decrease (0% growth)	21.6	25.52	30.5	52.3
Cost increase (100%) and benefits decrease (0% growth)	17	16.61	60.5	52.3
Cost increase (461%)	12	0	139.6	110.5
Benefits decrease (- 53% AADT)	12	0	30.3	26.7

- 4.20 These calculations imply that either a cost increase of up to 100% or a 0% traffic growth would still result in an economically feasible project. Similarly, a combined cost increase of 100% and a 0 % traffic growth would still result in an economically feasible project. Finally, if cost increases up to 461% or there is a reduction in benefits of up to 76% (equivalent to a reduction in AADT of 53%), the project would still be economically feasible. Therefore, it can be concluded that even using very pessimistic assumptions, the Project remains robust and economically feasible.

E. Financial viability

- 4.21 Funding for the local counterpart of this project will come directly from the central government budget. The availability of counterpart funding has not presented a obstacle to project execution in Guyana in recent years, and this situation is expected to continue.
- 4.22 The increase in external indebtedness resulting from the loan operation is also considered sustainable. Under the current IMF-supported PRGF programme, a benchmark of 260% has been established for the ratio of disbursed external debt

² Values discounted at 12% per year.

to revenue. Beyond this level, the contracting of new debt by GOG will be subject to increased vigilance. Projected disbursements for the proposed operation have been incorporated by the IMF into its debt sustainability analysis, along with other Bank projects expected to be approved in the carry-over period for the 2002-03 FSO allocation.³ The ratio of disbursed debt to revenues is expected to peak just below the 260% ratio in 2007, declining thereafter. Nevertheless, Guyana's external debt position will need to be closely monitored to ensure that it remains within the agreed ceiling.

F. Environmental and social viability

- 4.23 The New Amsterdam – Moleson Creek Road Rehabilitation Project is considered environmentally and socially viable. The Environmental Management Plan (EMP) permitted the incorporation of several elements that enhanced the overall design during the project preparation process, including aspects of pedestrian safety, improved drainage, sidewalks, warning signs, parking lanes and the safeguard of environmental processes related to erosion and sedimentation, proper waste management and the minimization of impacts related to construction activities.
- 4.24 The net potential socio-environmental impacts of the Project are, in general, likely to be positive. By improving the physical, operational and safety conditions of the road, the Project can potentially make the following positive contributions to socio-environmental quality: i) increased safety for pedestrians with the provision of warning signs, protected sidewalks and paved shoulders, street lighting, pedestrian crosswalks and reduced speed zones, especially in built-up areas and in proximity to schools, hospitals and markets; ii) increased safety for the traveling public in private and public vehicles and truck transport thanks to the provision of chevrons and warning signs in areas with obstructed line-of-site and dangerous curves, and controlled speed zones and reflectors embedded in the pavement at dangerous curves; iii) reduced travel time and economic costs arising from lost work hours due to delays, thanks to a decrease in traffic jams; iv) decrease in stress and noise level due to the diminished frequency and duration of traffic congestion; v) more efficient movement of produce to markets, and improved access to shop and markets with the provision of parking lanes in built-up areas; vi) improved transport services to hospitals and schools, and improved response time for fire and police services; vii) a reduction in the number and severity of vehicle-to-vehicle and vehicle-to-pedestrian accidents, with concomitant reductions in injuries and fatalities, health and police services costs, and reduced costs associated with vehicle damage (from potholes and accidents); viii) improved storm water management thanks to the construction, rehabilitation and cleaning of drainage systems, with a reduction in the impacts of local and sub-regional flooding to residential, agricultural and business properties, and a reduction in road deterioration and erosion and sedimentation processes; ix) reduction in the per-km costs of vehicle operation (fuel, lubricants, wear-and-

³ The carry-over period extends to June 30th, 2004.

- tear); and x) reductions in emissions and local air pollution as traffic will move more smoothly with a decrease in stop-and-go traffic and congestion.
- 4.25 Given the characteristics of the proposed civil works, as well as the fact that they will take place mostly within the existing right-of-way, the potential negative impacts of the Project are expected to be: i) generation of dust, noise and gases by the operation of construction equipment, asphalt plants and vehicles; ii) traffic congestion, creation of hazardous driving conditions and temporary obstruction of access to community services and residential and commercial areas during the execution of construction activities; iii) risk of on-the-job accidents and sickness for workers; iv) removal of secondary vegetation during the execution of earth movement operations; v) soil erosion and landscape degradation with possible sedimentation of nearby water bodies, resulting from earth movement (excavation, exploitation of quarries and borrow pits, etc.); vi) soil and water contamination and landscape degradation due to wastes and effluents (garbage, used waters, oil, grease, fuel, paint, etc.) coming from work areas, equipment yards and asphalt plants; vii) landscape degradation and contamination of water bodies due to inadequate disposal of removed waste pavement; and viii) accidental rupture of utilities pipes and lines (electricity, telephone, water and sewer), and temporary interruption of services during the excavation and removal of pavement. These potential negative impacts will be avoided or attenuated through efficient application of environmental management specifications included in construction contracts.
- 4.26 The environmental assessment and management process in Guyana is under the responsibility of the Environmental Protection Agency (EPA), whose creation was established in the Environmental Protection Act, enacted in June 1996. As a condition for the issuance of the Environmental Permit required by the Act for the implementation of the Project, the MPW&C submitted an EMP that was approved by the EPA and the Environmental Permit was granted in March 2004. As a result, the Project already has the environmental authorization required for civil works to proceed.
- 4.27 The plan proposed by the project team to ensure the environmental and social sustainability of the Project is based on a site visit; results of public consultations; meetings with environmental and transport national agencies; consultations with the environmental, social and engineering specialists of the consulting consortium hired to prepare Project studies and designs (i.e., Environmental Study, Environmental Management Plan, Feasibility Study and Detailed Designs); and review of available Project studies and designs (i.e., Environmental Study, Environmental Management Plan and Feasibility Study). The plan consists of the following components:
- 4.28 ***Impact mitigation.*** To prevent and mitigate anticipated negative impacts of the Project, the following measures and activities were or will be developed: i) *Environmental Management Plan (EMP)* including detailed mitigation measures, their timing, responsibilities and place of implementation, already approved by

the EPA and prepared following accepted international technical quality standards and according to Bank guidelines for these types of studies; ii) *General and Particular Environmental Specifications* aimed to protect natural resources, material goods and human health during the construction phase of the Project, included as an appendix to the EMP; and iii) Preconstruction conferences in the construction site to discuss when, where and how construction activities and mitigation measures are to be implemented, and to clarify any questions or doubts about the Project, its execution or its mitigation measures.

- 4.29 ***Supervision and Monitoring.*** The supervision, inspection and enforcement of the application of EMP will involve the participation of the WSG's environmental engineer, the supervisory firm, the contractor and the EPA. The MPW&C will contract, with Bank loan funds, an international supervisory firm that will provide an internationally-experienced environmental inspector, who will be assisted by a locally-contracted environmental inspector. The environmental inspectors will oversee construction contractors' compliance with environmental mitigation and management specifications, and provide training to MPW&C, WSG and Contractors' staffs. In order to supervise compliance with the provisions stipulated in the Environmental Permit, the EPA will assign a member of its staff to liaise with the WSG's Environmental Engineer. The project will provide financial assistance to EPA personnel to carry out monthly site inspections. The EPA will receive quarterly reports and any other reports prepared in relation to environmental emergencies that may occur (e.g. spills of hazardous substances). A Socio-Environmental Monitoring Program will be initiated during the construction phase and will be continued through to the operation phase. Essentially, monitoring will be carried out to ensure the environmental viability of construction activities and proper follow-on maintenance, and include the following general areas: soil and water quality, vegetation health, and interference with residential and business activities.
- 4.30 ***Training.*** The proposed training program uses the Moleson Creek - New Amsterdam Road Rehabilitation Project as a case study to teach the practical aspects of environmental mitigation and management in the road sector. Funds will be budgeted into the Supervisory Engineer's contract to cover the costs of training. The focus of the training program depends on the target group, as follows: i) WSG's Environmental Engineer and MPW&C senior staff: basic environmental management and procedures for managing EMPs; ii) Construction Contractors' personnel: environmental management, environmental emergency response, materials handling, waste material management and application of environmental mitigation and management specifications; iii) MPW&C and WSG staff, Police and Fire Service personnel, Construction Contractors' Environmental Managers: management of hazardous materials spills, and compliance with Guyana's environmental policies and legislation and international standards for environmental emergency response; and iv) Construction Contractors' personnel: implementation of the EMP, and basics of emergency response, spills control and hazardous materials handling and management.

- 4.31 The complete contents of the EMP will be considered an integral component and specifications of the Project design and contractual requirements. The EMP provides a systematic compilation of recommended actions, institutional framework and procedures developed over the course of the project design considered necessary to address environmental concerns and avoid or minimize negative impacts to the natural, social, cultural and economic environment that could result from construction and/or operation of the New Amsterdam – Moleson Creek Road Rehabilitation Project.
- 4.32 Environmental and social mitigation and management actions proposed in the EMP fall into a number of categories: a) Procedures to be followed during construction (e.g., fuel management, waste disposal, water management, dust control, traffic management, etc.); b) Waste management procedures for solid waste, hazardous waste and demolition debris; c) Construction stage inspection, reporting and monitoring; d) Emergency response procedures, including spills management and contingency measures; e) Post-construction monitoring, inspection and reporting; f) Procedures to be followed during operation (e.g., maintenance, vegetation clearing, etc.); g) Institutional / organizational arrangements to facilitate implementation of the EMP; and h) Training MPW&C/WSG Environmental Specialist, senior MPW&C staff, construction contractor personnel, emergency response personnel, and invited EPA staff
- 4.33 In addition to a description of the actions to be taken, the EMP also provides: i) recommended timing for implementation of each action, ii) assignment of agency/person responsible for ensuring implementation of the action within the specified timeframe, iii) institutional arrangements, including reporting lines and relationships of persons/parties responsible for carrying out each action, and iv) estimates of costs to implement the EMP.
- 4.34 Institutional strengthening activities will improve MPW&C's capability for environmental management, and the Ministry will be more efficient in monitoring the compliance and quality control in the application of environmental mitigation measures during execution of the Project. Training and technical assistance of MPW&C staff, construction contractor personnel and Police and Fire Services in environmental management and emergency response will lead to improvements in operations of similar future projects throughout the country.

G. Poverty Alleviation

- 4.35 Despite the resurgence in economic activity over the past decade, Guyana's GDP per capita of US\$975 is still one of the lowest in the region and much of its social infrastructure remains in a state of deterioration. Consistent with Guyana's successful economic performance in the 1990s, absolute poverty at the national level declined from 43% in 1993 to 35% in 1999. While this decline is significant, the overall rate is still high by regional standards. The largest decline in poverty occurred in Georgetown, from 29% to 16%, with smaller decreases in other urban areas (from 23% to 15%) and the rural coastal region (from 45% to 37%). The

Moleson Creek-New Amsterdam Road is located along the rural coastal region and approximately 30% of the country's population uses this road. A 1999 poverty survey of Guyana done by UNDP classifies the poverty level in this region as very and most severe. This classification indicates that the road serves mainly communities that are under the poverty line that was defined as G\$91,668 or about US\$510 per annum per person.

- 4.36 In addition the road currently serves an average daily traffic volume between 5,000 and 7,500 vehicles. Out of this total volume of traffic, about 40% are mini buses or small buses, with capacities varying between 12 and 15 passengers who are classified as low-income groups. Also, the rehabilitation of the road will provide future services to outpatient citizens that currently use the main hospital in Georgetown and in the future will use the new health facilities to be constructed along the coastal area outside of Georgetown. Therefore the project meets the geographic PTI criteria.

H. Road Safety

- 4.37 Accident records have already been compiled by the WSG for the years 1998 through 2000 and other research is underway. The predominant pattern recorded appears to be "uni-directional" collisions with other vehicles (usually mini-buses) and pedestrians or cyclists. Collisions with livestock are also commonplace.
- 4.38 Driving speeds are high on the route in general and could well increase in the post-construction stage. Some reduction in accident frequency may be realizable through the introduction of edge lines and lighting, although collisions with buses and livestock may continue to be problematic without additional provisions. Similarly, reductions in accident severity may be brought about through the enforcement of speed restrictions and parking regulations. Consideration for the introduction of traffic calming devices (e.g. humps, rumble strips and roadway section width constrictions) may be warranted. However, the full benefit of these measures could perhaps really only be achieved with the full cooperation of the relevant agencies and a road users' awareness and education campaign conducted at the national level. Improvement of highway safety was considered during the feasibility study on a project level, and on "critical points" at the network level.

I. Beneficiaries

- 4.39 The Project will have a positive impact upon the rural population of Guyana who rank among the poorest in the hemisphere. As a result of the Project, the physical, operational and safety conditions of the road will be improved, resulting in the following positive contributions to socio-environmental quality: i) *traveling public*: reduced travel time and economic costs arising from lost work hours due to delays; increased safety in private and public vehicles and truck transport due to the provision of chevrons and warning signs in areas with obstructed line-of-site and dangerous curves, and controlled speed zones and reflectors embedded in the pavement at dangerous curves; reductions in the per-kilometer costs of vehicle

operation and in emissions and local air pollution as traffic will move more smoothly with a decrease in stop-and-go traffic and congestion; ii) *pedestrians*: increased safety in built-up areas and in proximity to schools, hospitals and markets with the provision of warning signs, protected sidewalks and paved shoulders, street lighting, pedestrian crosswalks and reduced speed zones; iii) *traveling public and residents*: reduction in the number and severity of vehicle-to-vehicle and vehicle-to-pedestrian accidents; decrease in stress and noise level due to the diminished frequency and duration of traffic congestion; and iv) *producers and residents*: more efficient movement of produce to markets and transport services to hospitals and schools; improved storm water management thanks to improvements of drainage systems, reducing impacts of local and sub-regional flooding and erosion and sedimentation processes.

J. Risks

- 4.40 The risk of procurement delays was associated with the institutional weaknesses of the Central Tendering Board. However, new procurement bills approved in May 2002 and June 2003 represent an improvement and a new National Tender Board with public and private representation has been created by law to replace the existing CTB, although its provisions have not yet been implemented. To contribute to reduce this risk, GOG informed that World Bank committed to providing additional assistance in the implementation of the law through the development of relevant regulations and procedures. Additionally, with support from the IADB and other financial institutions, research and analyses have been undertaken and study reports prepared in support of preparing a country procurement assessment report.
- 4.41 Another risk is the weakness of the MPW&C to monitor contractors, and to avoid implementation delays and possible contractor's claims which may result in major cost overruns. The Project Team recommends continuing with the performance based lump-sum procedure implemented in the Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), the airside rehabilitation of the Cheddi Jagan International Airport as part of the Air Transport Reform Program (LO-1042/SF) and the Bridges Rehabilitation Program (LO-999/SF), and that the MPW&C has accepted. Lump-sum contracts will be used for the rehabilitation works (including 3-years routine maintenance works) and for engineering supervision using ICB procedures.
- 4.42 To further reduce risks associated with institutional weaknesses, delays in initiation that may lead to cost overruns, and implementation, the Project will provide funds to continue with the on-the-job institutional strengthening of the WSG through development and implementation of an action plan, improved management information systems, procedures, technical assistance, training, etc. Additionally, an engineering consulting firm, selected through an International Competitive Bidding Process (ICB), will have a major role in the supervision of the civil works. These measures will reduce the risk associated with the relatively weak institutional capacity of the MPW&C.

GUYANA
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LOGICAL FRAMEWORK

GOAL	OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
GOAL	Contribute to the Increase of economic competitiveness			
OUTCOME	<ul style="list-style-type: none"> • Reduce road user's costs and improve road safety. • Improve institutional capacity of the MPW&C 	<ul style="list-style-type: none"> • Roughness (IRI indexes) on the NA-MC road less than 3.0 after the completion of the rehabilitation works by the end of 2009; vehicles' speed between 50km/h (urban areas), and 70 and 80 km/h. (rural areas), by the end of 2009; AADT above 2400 vehicles per day.¹ • Fatality reduction of 10% along the NA-MC road and 20% reduction on critical sections, 2 years after its rehabilitation. • Transport sector policy developed. 	<ul style="list-style-type: none"> • Use of HDM4 program with actual traffic data. • MPW&C records of performed maintenance such as the reporting procedures of the RMMS. • Functional evaluations of road using indicators such as the BI to gauge the extent and severity of road defects (roughness, rutting, fatigue cracking, etc.) to fulfill standard IDB contractual maintenance clauses.. 	<ul style="list-style-type: none"> • Macroeconomic framework remains stable. • Pro investment business climate. • Export oriented development strategy in place. • Continuing investment in road maintenance and in highway safety.
OUTPUTS	<ul style="list-style-type: none"> • New Amsterdam – Moleson Creek road rehabilitated on time and on budget. • Feasibility study for the Demerara River Crossing completed. • Urban transportation study for completed. • Rural transportation studies: diagnostic, identification of priorities, preparation of standards, designs, maintenance plans and baseline are completed. • Increased capacity of WSG to efficiently implement 	<ul style="list-style-type: none"> • Road rehabilitation completed by first half of 2007 & within 10% of contract cost. • Construction of sidewalks, parking lanes, lighting along the NA-MC road, according to final designs, completed by first half of 2007 & within 10% of contract cost. • Final Report of the consultants for the feasibility study for the Demerara River Crossing completed by first half of 2006. • Final Report of the consultants for the urban transportation study for Georgetown 	<ul style="list-style-type: none"> • Inspection by IDB Country Office. • Supervisory consultant report. • WSG, CTPU and MPW&C semestral reports. • Auditors report. • MPW&C highway safety records. 	<ul style="list-style-type: none"> • Adequate counterpart funds provided. • Adequate budgetary allocations and provisions in accordance with mandate of WSG and CTPU. • Adequate enforcement of traffic laws by Police Force. • Continuing with adequate budget provision for road maintenance in accordance with RMMS specifications and bidding documents.

¹ The simultaneous fulfillment of these three conditions will allow an internal rate of return of, at least, 12% by the end of 2009.

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LOGICAL FRAMEWORK

	OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
	<ul style="list-style-type: none"> investment programs and contract improvement, rehabilitation and maintenance of roads. Central Transport Planning Unit (CTPU) capable of developing policy, strategy and prioritization of investments. 	<ul style="list-style-type: none"> completed by first half of 2006. Final report of the consultants for the rural transportation studies completed by end of 2005. WSG/ CTPU strengthened: fully staffed and technical consultancies contracted. Transport sector policy developed by CTPU & indicative list of projects prioritized & costed by end of 2005. 		
INPUT	<ul style="list-style-type: none"> Technical assistance for strengthening the CTPU of the MPWC. Institutional strengthening for WSG. Equipment for WSG and CTPU. Rehabilitation of New Amsterdam – Moleson (NA – MC) Creek Road. Supervisory Engineers. Audit firm. Urban transport study for Georgetown. Feasibility study for the Demerara River Crossing. Rural transportation studies. 	SEE BUDGET TABLE	<ul style="list-style-type: none"> Inspection by IDB Country Office. Supervisory consultant report. WSG, CTPU and MPW&C semestral reports. Auditors report. 	<ul style="list-style-type: none"> At least 3 suitably qualified contractors and supervisors firms present proposals for prequalification. Competitive bidding attracts qualified contractors and supervisors. Macro economic situation in country remains stable to permit adequate budgetary provisions for counterpart funds in a timely manner. Procurement processes are done in a timely manner.

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PROCUREMENT PLAN

Activity	Year and Quarter of Advertisement	Contract Amount (US\$ '000)	% IDB	Procedure
Engineering consulting firm to supervise rehabilitation of New Amsterdam – Moleson Creek	III - 2004	2,500	100	ICB
Independent public accountant (private audit) firm to audit the program	III - 2004	350	100	ICB
Construction firm for rehabilitation of New Amsterdam – Moleson Creek (civil works)	III - 2004	30,300	94	ICB
Consulting firm for urban transportation study for Georgetown	III - 2004	1,000	80	ICB
Consulting firm feasibility study for the Demerara River Crossing	III - 2004	600	67	ICB
Consulting firm for rural transportation studies	III - 2004	700	86	ICB
Technical assistance to WSG and CTPU: several individual consultants	Throughout the project implementation period beginning III - 2004	1,500	100	IPB
Equipment and software for WSG and CTPU	III - 2004	50	100	NCB
Local staff WSG and CTPU and operational costs	III - 2004	1,500	0	NPB

Threshold amounts	Goods	US\$ 250,000
	Civil Works	US\$ 1,000,000
	Consultancies	US\$ 200,000

ICB International Competitive Bidding
IPB International Private Bidding
NCB National Competitive Bidding
NPB National Private Bidding

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PROJECT MONITORING CHECKLIST

Area	Indicator
Institutional Strengthening	<ol style="list-style-type: none"> 1. Highway Engineer, Materials Engineer and Contract/Procurement Specialist hired to complete WSG staff by December 2004. 2. CTPU fully operational, with all staff hired (Chief Transport Planning Officer -existing position-, Transport Planning Officer, Transport Economist, and Planning Technician) by December 2004. 3. Individual consultants hired between February and June 2005.
New Amsterdam – Moleson Creek Road Rehabilitation Program	<ol style="list-style-type: none"> 1. Engineering supervision firm mobilized by end February 2005. 2. Short list for construction firms determined by the end March 2005. 3. Audit firm mobilized by end February 2005 4. Construction firm mobilized by June 2005. 5. Construction completed by July 2007.
Studies and design preparation	<ol style="list-style-type: none"> 1. Firms selected by January 2005. 2. Firms mobilized by March 2005.