

**GUYANA**

**TRANSPORT INFRASTRUCTURE REHABILITATION PROGRAM**

**(GY-L1008)**

**LOAN PROPOSAL**

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Electronic Links and References	
Basic Socioeconomic Data	<a href="http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata">http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata</a>
Status of Loan in Execution & Loans Approved	<a href="http://portal.iadb.org/approvals/pdfs/GYen.pdf">http://portal.iadb.org/approvals/pdfs/GYen.pdf</a>
Tentative Lending Program	<a href="http://opsgsl/ABAPRJ/tentativelending.ASP?S=GY&amp;L=EN">http://opsgsl/ABAPRJ/tentativelending.ASP?S=GY&amp;L=EN</a>
Information available in the files of RE3	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=720791">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=720791</a>
Annex III: Project Performance Monitoring Report	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=730509">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=730509</a>
Map	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=739496">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=739496</a>

## ABBREVIATIONS

AIC	Average Incremental Cost
AOP	Annual Operation Plan
BBPR	Black Bush Polder Road
CARTAC	Caribbean Regional Technical Assistance Center
CDB	Caribbean Development Bank
CIDA	Canadian International Development Agency
CTB	Central Tendering Board
DBST	Double Bituminous Surface Treatment
EC	European Commission
E-HIPC	Enhanced Highly Indebted Poor Countries
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESI	Environmental and Social Impact
GDP	Gross Domestic Product
GM	Georgetown - Mahaica
GOG	Government of the Cooperative Republic of Guyana
GPF	Guyana Police Force
HDPE	High Density Polyethylene
ICAS	Institutional Capacity Assessment System
ICB	International Competitive Bidding
IDB	Inter-American Development Bank
IIRSA	Initiative for Regional Infrastructure Integration in South America
IMF	International Monetary Fund
IRR	Internal Rate of Return
LRMC	Long Run Marginal Cost
MDRI	Multilateral Debt Relief Initiative
MOU	Memorandum of Understanding
MPW&C	Ministry of Public Works and Communications
MR	Mahaica - Rosignol
NPV	Net Present Value
NPTAB	National Procurement and Tender Administration Board
OVE	Oversight Evaluation Office
PPMR	Project Performance Monitoring Report
PRGF	Poverty Reduction and Growth Facility
PSIP	Public Sector Investment Program
RA	Risk Assessment
RDC	Regional Democratic Councils
RMMS	Routine Maintenance Management System
TG	Timehri – Georgetown
VOC	Vehicle Operating Cost
WB	World Bank
WSG	Works Services Group
WTP	Willingness to Pay

**PROGRAM SUMMARY**  
**TRANSPORT INFRASTRUCTURE REHABILITATION PROGRAM**  
**(GY-L1008)**

<b>Financial Terms and Conditions <sup>1</sup></b>			
<b>Borrower:</b> The Cooperative Republic of Guyana			<b>Amortization Period:</b> 40 years
<b>Executing Agency:</b> Ministry of Public Works and Communications			<b>Grace Period:</b> 10 years
			<b>Disbursement Period:</b> 5 years
<b>Source</b>	<b>Amount (million)</b>	<b>%</b>	<b>Interest Rate:</b> 1% during grace period, 2% thereafter
IDB (FSO)	24.30	90%	<b>Supervision &amp; Inspection Fee:</b> 1.00%
Local	2.70	10%	
Other/Cofinancing	-	-	<b>Credit Fee:</b> 0.50%
Total	27.00	100%	<b>Currency:</b> US Dollars
<b>Program at a Glance</b>			
<p><u>Program objective:</u> The goal of the Program is to promote permanent accessibility and safety along the main national road network. Specific objectives of the Program will be the improvement of the road network reliability and driving conditions along the Timehri – Rosignol roadway by replacing or rehabilitating existing critical structures; the improvement of road safety conditions, and strengthening of the ongoing road maintenance activities along the main national road network. Finally, the Program includes the rehabilitation of the Black Bush Polder Road, a main road located in one of the significant agricultural areas of the country.</p> <p><u>Special contractual clauses:</u></p> <p>Prior to first disbursement, approval of WSG's Manual of Standard Operating Procedures (¶3.4).</p> <p>Bidding documents for the selection of Contractors must incorporate: a) the Environmental Management Plan (¶3.5, ¶4.32, ¶4.35and ¶4.36), b) the final technical designs (¶3.5 and ¶3.9), and c) the requirement to hire Environmental Specialists (¶3.12, ¶4.32, ¶4.34 ¶4.35and ¶4.36).</p> <p>Bidding documents for the selection of supervision firms must incorporate the requirement to hire Environmental Inspectors (¶3.6, ¶4.33, ¶4.35and ¶4.36).</p> <p>Prior to issuing bidding documents for selecting Contractors, select and hire supervision firms (¶3.10).</p> <p>Prior to authorizing the designs for the works under the Black Bush Polder Road component, submit for Bank's no objection the economic feasibility studies (¶3.9).</p> <p>Prior to initiation of the first civil work, corresponding environmental licenses issued (¶3.5 and ¶4.26).</p> <p>Prior to initiation of Lot B of the Structure Rehabilitation component, at least two scales for measuring vehicle weight have been installed and are in operation (¶3.5).</p> <p>Prior to issuing the bidding documents for the selection of the first Contractor to carry out routine maintenance works: (i) approve and implement a system for the evaluation of the Contractors carrying out routine maintenance work in the national road network and evaluate all contractors then carrying out routine maintenance work in the national road network utilizing that system and (ii) update the existing databases on road condition surveys and on unit costs (¶3.7).</p> <p>Bidding documents for the selection of routine maintenance contractors must incorporate: i) the recommendations contained in the "The Roadway Maintenance Program and Routine Maintenance Management System - Final Report" issued by the MPW&amp;C in April 2005; and ii) the roadway maintenance manual (¶3.7).</p> <p>Prior to issuing the bidding documents for the procurement of road safety equipment the Executing Agency will sign with the Ministry of Home Affairs a Memorandum of Understanding (¶3.8).</p> <p>Prior to issuing the bidding documents for the selection of Contractors to carry out civil works for lot B of the Structure Rehabilitation component, submit for Bank's no objection the economic feasibility study (¶3.5).</p>			
Exceptions to Bank policies: None			
Program consistent with Country Strategy: Yes [ X ] No [ ]			
Program qualifies for: SEQ [No] PTI [No] Sector [ ] Geographic [ ] Headcount [ ]			
Procurement: See Paragraph: ¶3.14			
Verified by CESI on: April 14 2006			

## **I. FRAME OF REFERENCE**

- 1.1 This program will support the ongoing strategy of rehabilitation or replacement of existing critical highway infrastructure that has completed its economic life expectancy. In addition the program promotes the continuity of road maintenance and traffic safety activities. This scope of works will contribute to the reliability of the road network, the reduction of transportation costs and the improvement of driving and safety conditions.

### **A. Socioeconomic framework**

- 1.2 Guyana is a low-income, thinly populated country with a predominantly agricultural economy. The total population according to the 1991 census was 723,000. Based on available data from 2002 census, population growth shows marginal increases of 0.3% per year. The vast majority of the population lives in the coastal strip. The country is divided into 10 Administrative Regions, governed by Regional Democratic Councils (RDCs). 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. Regions 1, 7, 8, and 9 are classified as the interior regions - rural and remote, and sparsely populated.
- 1.3 Despite rich endowments of mineral resources, biodiversity and land, economic development was stymied in the 1970s and 1980s, which reduced GDP per capita to one of the lowest levels in the region. Beginning in 1988, policy reforms in the exchange rate and in fiscal, monetary, 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 of over 100% in the late 1980s was reduced 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).
- 1.4 In recent years Guyanese authorities have maintained macroeconomic stability under successive IMF programs, with low inflation and a stable exchange rate. The economy grew by just 0.2% on average from 1998 to 2005. During this period, domestic investment lost dynamism, falling by 12% of GDP, largely as a result of a decline in private investment by around 11% of GDP. Foreign direct investment flows fell to 7.0% of GDP in the same period, from the previous level of 19% (1991-1997). Public investment, however, has grown rapidly over the past few years, from 12.6% of GDP in 2002 to 24.35% in 2005, suggesting a possible crowding-out of private investment. More recently, extensive flooding combined with high fuel prices caused GDP to contract by 3.0% in 2005.
- 1.5 Guyana reached the Completion Point under the Enhanced Highly Indebted Poor Countries (E-HIPC) Initiative in 2004, reducing the country's external debt by more than half in relation to its level at the end of 1998. Although the level of debt is still high and the country is vulnerable to shocks that could increase the debt-to-

revenue ratio, it is important to note that the most recent analysis of debt sustainability, by the IMF and World Bank, projects the debt-to-revenue ratio to be in a manageable range during the period of execution of the Program. With the Multilateral Debt Relief Initiative (MDRI), the debt relief ratio was estimated at 217% at the end of 2005, and is expected to fall before peaking again at 205% in 2011. Although the threshold for Guyana is 250%, the country is still at moderate risk for debt distress, remaining vulnerable to exogenous shocks such as exchange rate depreciation and less favorable terms of trade and borrowing. Nevertheless Guyana's debt service indicators remain below the respective thresholds, suggesting that debt service payments are manageable. Under the MDRI, debt service reductions are expected to average almost US\$ 10 million per annum over 2006-10, equivalent to about 1% of GDP.

- 1.6 The Fifth Review under the IMF Poverty Reduction and Growth Facility (PRGF) completed in January 2006 found only limited room for additional borrowing over the next four years and highlighted the need for the Government of Guyana (GoG) to reduce spending to restore fiscal balance. The PRGF Arrangement expired in September 2006, discussions on a new facility are expected to begin in early December 2006. However, IDB-financed investment operations already included in the Public Sector Investment Program (PSIP), including this operation, will not be affected.

## **B. Infrastructure in the Transport Sector**

- 1.7 The road network of Guyana totals 3,995 km, 500 of which are paved, and serves a national fleet of about 52,000 vehicles. The six main national paved roads have two lanes, except for segments along the East Bank and East Coast Demerara, which have four lanes. Guyana's ground transport system depends heavily upon the reliability of its bridges and culverts along the road network. Much of the Atlantic coastal lands are below mean sea level making necessary a dense system of drains, canals and sluices to permit habitation and agriculture. Most of these waterways run perpendicular to the shoreline and consequently must be crossed by the main roads, substantially increasing construction and maintenance costs of the road network. The majority of the most populated area is located in these regions.
- 1.8 Although the road network is one of the sparsest in South America, most of the population have access to paved roads, since both the concentration of the population and the road systems are located in the coastal areas. Over the last 10 years GOG has embarked on progressive rehabilitation of the roadways and structures along these roads. Yet the road network in the interior is short and in bad condition, consisting mainly of roads easily accessible only during the dry season and limited to 4wd drive vehicles. Overall, the transport system is supported by a network providing inadequate rural and international connections and highly congested roads in urban areas with poor quality and costly transport services (ferries and buses).

## **C. Institutional framework in the Transport Sector**

- 1.9 Government responsibilities in the transportation sector are spread among various agencies, with the Ministry of Public Works and Communication (MPW&C) having the central role. The MPW&C is basically responsible for transport policy and the provision and maintenance of almost all major transport infrastructures. The Ministries of Agriculture, Housing and Water, and Local Government assume the responsibility for providing and maintaining some local road infrastructure while the Ministry of Home Affairs assumes some regulatory functions regarding safety and security of transport services.
- 1.10 As part of the strategy for the institutional strengthening of the MPW&C supported by the Bank, the Works Services Group (WSG) was created in 2002 as a project unit within the MPW&C, specifically designed to manage and implement public investment programs in road infrastructure. The operational cost of the WSG is financed in full with budgetary funds from GOG.
- 1.11 WSG's primary responsibilities include the execution of three IDB loan contracts: Bridges Rehabilitation Program (LO-999/SF), Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), and New Amsterdam-Moleson Creek Road Rehabilitation Project (LO-1554/SF), minor road and bridge design and maintenance, and planning and coordination of governmental transport investments. Other responsibilities include acting as executing agency for the Initiative for Regional Infrastructure Integration in South America (IIRSA) activities, assignments related to right-of-way works, in-house designs for forced account works, GOG funded capital works, and lending general engineering advice to several local authorities and institutions responsible for infrastructure projects.

## **D. Bank's experience**

### **1. Road and structure rehabilitation**

- 1.12 Three ongoing operations from the Bank are funding the rehabilitation of roads and related bridges and culverts. The Bridges Rehabilitation Program originally envisaged the rehabilitation of 284 structures along the road segment from Timehri to Rosignol. During its preparation, structures were prioritized into two lots. Designs and cost estimates were completed for a sample of 57 structures (Lot 1). The estimated construction cost for the sample was US\$ 7.7 million, while the projected construction cost for all the structures was US\$ 14.7 million. In 2001, the MPW&C modified the designs, resulting in new cost estimates for Lot 1 of US\$ 13.8 million. Of the two firms that were prequalified, the bid ranked first had a tender price for Lot 1 of US\$ 22.7 million. Following the tendering of works for Lot 1, the construction methods and designs were reviewed, and the scope of the contract was expanded to include the construction or rehabilitation of approximately thirty additional structures originally prioritized into Lot 2 at no additional cost. The final scope of the works included the rehabilitation of 81 structures, the contract for which was completed during May 2005. Implementation

of the operation reached 67% disbursement by September 2004 and has remained at that level since then<sup>1</sup>. The structures not included were reassessed and prioritized, resulting in the structures to be included in this Program.

- 1.13 The Bank approved the loan to finance the Mahaica Rosignol Road Rehabilitation Program in November 2001, and works started in May 2003 on various sections of the Mahaica - Rosignol roadway. By March 2006, 88% of the resources of the Loan had been disbursed. Additionally, the Bank approved the New Amsterdam – Moleson Creek Road Rehabilitation loan in June 2004. Due to diverse reasons, among which recognizable factors are the limited supply of construction inputs, price volatility experienced regionally, and high cost of importing equipment, the original contracting of civil works for the New Amsterdam-Moleson Creek Program resulted in excessively high bidding prices. In order to mitigate these increases in tender prices, the works were re-tendered, with the implementation of mechanisms built into the contract to reflect price fluctuations, with adequate clauses to prevent run away price escalation. The mechanism utilized bills of quantities and treated non-critical drainage structures and bridges as provisional items in order to reach baseline prices. The resulting tender prices were approximately 15% below those received in the previous process and were still above the budget. However, the tender prices for the road works and critical drainage structures and bridges were 18% below the budget and one of the two Lots has been awarded on this basis. It is anticipated that the second lot would be awarded shortly.

## **2. Black Bush Polder road**

- 1.14 The Black Bush Polder Road (BBPR) consists of a loop road off the Correntyne Highway, serving the large communities of Yakusari, Joanna, Mibikuri and Lesbeholden. This area is one of the largest agricultural zones in Guyana, where the main production includes rice, fruits and vegetables. Some important rice processing plants are included in the area. BBPR, a corridor of approximately 34.8 km in length that links the villages to the Correntyne Highway, is the only means of transporting products out of the area. The roadway is almost entirely flat except where it crosses the area's main drainage channels on raised wooden structures.
- 1.15 The “New Amsterdam - Moleson Creek Road Rehabilitation Project - Rural Feeder Road” design and feasibility study assessed the rehabilitation of the BBPR, together with the evaluation of the New Amsterdam - Moleson Creek Road. The studies proposed a full depth reconstruction for approximately 80 % of the road with an estimated cost of US\$13.3 million. Those original reconstruction designs of the BBPR developed during 2004 involved reconstruction and widening to all sections of the roadway from 4.5 to 6.5 meters. The designs recommended removing the existing base, excavating to full width, recompacting the embankment and placing a new asphalt surface. Additionally, the designs included

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<sup>1</sup> Remaining disbursement is for US\$ 10.5 million out of US\$ 41 million corresponding to the construction of the access roads to the Berbice River Bridge. GOG received proposals to construct such bridge in November 2005.



the replacement of the 14 existing wooden bridges with new concrete structures. Bank review of the study concluded that the proposed project was not feasible at the level of the investment envisioned. Subsequent revised studies, culminating with an investment of US\$6 million were also deemed not feasible.

- 1.16 Revised designs were adopted by GOG and a first stage of works is currently being financed by the GOG. According to GOG's revised designs, several sections of the pavement have failed while other areas have deteriorated and developed cracks, depressions, and potholes. In some areas there has been deterioration of the road shoulder while in others there has been excessive vegetation. All of the fourteen bridges along this roadway required repairs. The GOG's current rehabilitation activities include: correcting failed pavement areas with crushed stones; sealing surface cracks; scarifying and reshaping existing pavement; grading and shaping existing shoulders, and rebuilding clay shoulders along selected areas. Additionally the superstructures (deck, support members and curbs) of 14 bridges and the substructures (recapping of deteriorated concrete pier caps) of 3 bridges are being repaired or replaced.

### **3. Routine maintenance**

- 1.17 The MPW&C is responsible for maintenance of national paved roads, including routine maintenance activities. Expenditures by the MPW&C for routine maintenance of national paved roads have averaged US\$ 0.62 million per year. The Bridges Rehabilitation Program included resources for the development and installation of a computerized Road Maintenance Management System (RMMS), which was implemented during 2003 and 2004.
- 1.18 The RMMS is an integrated system of procedures designed to assist in the decision-making, planning, organizing, monitoring, controlling and implementing of roadway maintenance activities. The system is made up of various inter-dependent components that include roadway evaluation data collection, a database that contains technical information on the roadway and the roadway condition, roadway distress identification, resource needs and an analysis system. This information allows to prioritize and make cost-effective decisions on maintenance, plan maintenance activities, determine resource requirements including costs, monitor maintenance activities and costs, maintain a pre-determined level of service and to prepare preliminary, interim and final reports on the ongoing and completed maintenance activities.
- 1.19 The analyses and evaluation of the information collected from the field identification (walking survey) of the roadway distresses/defects has resulted in the determination of prioritized maintenance needs for any given section length and of the minimum and optimum budget allocations. Requirements for minimum standards have been estimated, using the RMMS, at US\$ 0.7 million (2003 prices), and in fact executed for approximately US\$ 1,500/km. The RMMS software also generates reports on many aspects of the roadway maintenance program, among the most important ones are the complete set of tender documents including the Bill of

Quantities for the required maintenance work and the Engineering Estimate for the proposed maintenance activities.

- 1.20 The WSG is using the RMMS to manage the roadway routine maintenance program of the MPW&C. A multi-year performance-based fixed price (lump-sum) contract has been adopted for the roadway maintenance program. The contractor is paid for work output and quality of performance rather than for work input as in contracts based on unit prices. The contractor is allowed to select the materials and work methods to complete the maintenance according to standards established in the contract, and thus responsibility for quality and scheduling rests with the contractor. The first routine maintenance contract was awarded in December 2003, works started in January 2004, and will be completed by November 2006. Subsequent contracts were awarded during 2004 and will be completed during 2007. Continuous support of the road system through implementation of routine maintenance has been a priority for GOG and the Bank. Works have focused on routine maintenance activities financed by GOG, and road safety activities financed by the Bank, in the most traveled corridors of the paved road system, resulting in most of these roads being in fair condition. Unpaved roads are not covered by the RMMS and are generally in poor conditions.
- 1.21 The loan for Mahaica Rosignol Road Rehabilitation Program has financed an evaluation of the development and implementation of the RMMS. This assessment, completed in 2005, has identified the areas for improvement, and developed recommendations and measures to address those needs. As part of the assessment, the following has been developed: a manual for road maintenance, a system to evaluate contractors, a review of the bidding documents and proposed changes, and a training program to increase the expertise and number of regional personnel, engineers and technicians from the MPW&C and other roadway agencies involved with the RMMS.

#### **4. Road Safety**

- 1.22 According to a 2003 road safety study financed by Loan 999/SF-GY, Guyana has an average of 2,872 accidents per year, resulting in 170 fatalities and a motor vehicle registration ratio of one vehicle per fifteen people. The total number of fatalities is approximately 0.059 per number of accidents, almost 15 times greater than the index corresponding to developed economies. This study identified ten corridors with the worst conditions regarding road safety, and developed a road safety strategy to address the main concerns. The improvement of road safety and the implementation of this strategy have been a long-standing priority for GOG and the Bank. Activities included in the three IDB programs address road safety needs by financing pavement markings and signs, street lighting, construction of sidewalks, and acquisition of road safety related equipment for the police, among other activities.
- 1.23 The focus of the road safety component of the Bridges Rehabilitation Program is on properly signing and marking 400 km of the main road network and installing

safety features such as sidewalks in urbanized areas as well as street lighting at intersections. The road marking and signing aspects of this component were combined with the activities under the RMMS and the selected maintenance contractors were given the task to install and maintain the highway safety measures (¶1.20). Highway safety features have been incorporated into eight maintenance contracts currently in progress. Four contracts for the construction of sidewalks have been completed. In addition, two contracts for street lighting have already been completed. Activities under the Mahaica Rosignol Road Rehabilitation and New Amsterdam-Moleson Creek Road Rehabilitation Programs have similar scope and cover other specific road segments.

- 1.24 Components such as marking, signing and reflective spikes; street lighting; construction of sidewalks and drains; and rehabilitation and replacement of structures, have been incorporated in the three ongoing operations. Grass cutting, drain cleaning, and acquisition of police equipment were incorporated into the Bridges Rehabilitation Program. Pavement widening was included in the Mahaica Rosignol Road Rehabilitation Program as this corridor was the only one with such a recommendation.

## **5. Weight control**

- 1.25 The Mahaica - Rosignol Road Rehabilitation Program includes a weight control component to safeguard the road investments being financed. The component includes the review of the existing weight limits to meet international standards, and it contemplates penalties for overloading vehicles and mandatory compliance by vehicle operators with weight limits. This component also includes the installation of six permanent weigh scales at key locations of the national paved road system. Several portable units will be procured and used for random checks of axle loads. At present, GOG has drafted the Terms of Reference, evaluation criteria and contract documents for the hiring of the consultant to undertake the weight control study, prior to installation of the weigh scales. The procurement of the consultant is currently in progress. The weight control program component is scheduled for completion by December 2007.

## **6. Contracting arrangements**

- 1.26 Previous unit price contracts in Guyana have allocated most or all of the risk to the public sector. As a result, the WSG has implemented the performance-based lump-sum modality for road and bridge construction and supervision (¶1.12 and ¶1.13). Lump sum rehabilitation and maintenance bidding procedures are most common in developed countries. These procedures have also been designed and implemented in Bank projects in Ecuador under loans 1057/OC-EC and 1138/OC-EC, with success.
- 1.27 The introduction of lump-sum contracts in rehabilitation and maintenance of infrastructure requires the preparation of precise designs, specifications and quantity estimates. During the tendering process, the bidders conduct a thorough

design review of all the plans and specifications before submittal of their proposals. In the final stage review with the selected contractor after justified design errors have been corrected, the contractor accepts all design conditions, quantities, specifications and drawings, so as to prevent claims for design errors or extra time during execution, which could have resulted in cost overruns. The inclusion of this design review stage in the projects using lump sum contracts does not eliminate all design errors, however the system as used is workable given that contingencies are incorporated for design changes.

- 1.28 The Guyanese experience with the lump-sum construction and supervision contract modality includes the airstrip and terminal rehabilitation of the Cheddi Jagan International Airport, part of the Air Transport Reform Program (LO-1042/SF), completed according to contractual budget and timetable; the Mahaica-Rosignol rehabilitation works and the routine maintenance contracts currently under implementation.
- 1.29 The Mahaica Rosignol Road Rehabilitation Program supports cost reliability, cost overrun restrictions and minimization of delays, in terms of using performance-based lump-sum investment and maintenance contracts for contractors and supervisors. It also includes the resources to evaluate the results of using lump-sum contracts in Guyana. Among them, an ex post evaluation was designed to improve the collaboration among all stakeholders and to improve cost reliability and cost effectiveness of road and bridge investment and maintenance projects. The New Amsterdam-Moleson Creek Program includes resources to evaluate the RMMS, lump sum investment, maintenance contracts, quality control procedures, institutional quality assurance of WSG, and social/environmental aspects of investment and maintenance contracts. Given the current status of these two operations, these evaluations have not taken place yet.

#### **E. Lessons learned**

- 1.30 During the 1990s, projects from all donors faced major implementation delays and cost overruns that have resulted from the difficulty of GOG to comply in a reasonable time with the conditions precedent to loan disbursement and to conclude contractual activities. The fragmentation of contracts was considered a major source of delays and cost overruns, as it seemed that small contracts did not attract well-qualified bidders. The execution of World Bank-funded Essequibo Road Project and IDB's Main Roads Rehabilitation Program (LO-890/SF) faced problems with claims from contractors and delays, resulting in final costs and execution period increases due to modifications of the scope of the works, price variations being contractually allowed, and major redesign of activities.
- 1.31 Since then three initiatives were introduced: the creation of WSG (§1.10), the development of the RMMS (§1.18) and the implementation of lump sum contracts (§1.28). The creation of WSG has produced good results in the execution (§1.12 and §1.13) and cost control areas. WSG successfully concluded designs and bidding documents for routine maintenance, and contracted performance-based

fixed-cost contracts to maintain 330 Km of roads in accordance with the RMMS (¶1.19, ¶1.20 and ¶1.23). In terms of financial sustainability of maintenance works, the GOG has committed itself to fund the expenditures required to achieve the minimum level of routine maintenance works determined by the RMMS, whose inventory has grown to cover 500 km of roads.

- 1.32 Ongoing IDB projects (Bridges Rehabilitation, Mahaica Rosignol Road Rehabilitation, and New Amsterdam-Moleson Creek Road Rehabilitation) have supported the above initiatives (¶1.12 and ¶1.13) by financing WSG's institutional strengthening, 3-year maintenance contracts with the private sector, and the bundling of activities into sufficiently large, partial or full performance-based lump-sum contracts.
- 1.33 Recent projects have incorporated technical/design elements that increase the timeliness and improved the quality of road and bridge construction. The New Amsterdam - Moleson Creek Road Rehabilitation Program incorporates standard designs for culverts, as well as precast construction methodology (¶1.13). Considering the significant period of time required to build in situ structures, the excessive traffic delays, and the need to dewater the area during the construction of the structures, the use of precast elements will reduce the need for temporary works, construction time and consequently mitigate the delays in traffic.

#### **F. The country's sector strategy**

- 1.34 The country's strategy for the road subsector consists of i) rehabilitation, improvement and extension of the road network, financed by external resources, and ii) routine maintenance of the rehabilitated network, implemented by the RMMS, and financed by recurrent resources. This strategy aims to reduce transportation costs, improve market access and overall competitiveness, and increase coverage of maintenance activities of main roads, bridges and other infrastructure. Guyana has been actively restoring infrastructure that in most cases has exceeded its life service, improving traveling conditions and road safety along public roads (¶1.12 and ¶1.13). Maintenance programs include the involvement of the private sector by means of contracting out continuous routine maintenance activities of existing infrastructure, as well as the strengthening of MPW&C's capacity to administer and maintain the road network through the development of a more comprehensive maintenance management system (¶1.17 to ¶1.21). This strategy is in line with the recommendations of the Transport Sector Study (¶1.42).

#### **G. The Bank's strategy**

##### **1. The Bank's country strategy**

- 1.35 The Bank's strategy in Guyana, expressed in the Country Paper (GN-2228), seeks to achieve medium-term poverty reduction, while simultaneously addressing chronic institutional and human resources problems, which must be alleviated in order for the country to achieve sustainable, equitable long term growth. The

strategy promotes growth oriented programs and policies, which will contribute to poverty reduction in Guyana.

- 1.36 To achieve the Bank's strategy, policies and investments have addressed i) sustainable economic growth, ii) improved governance and public sector efficiency, and iii) strengthening of social programs. Bank activities focus on an improvement of trade, competitiveness, investment and business environment for private sector development. Since the early preparation stages of the Support for Competitiveness program (GY-L1006), road infrastructure was identified as a major issue in achieving reductions in transport costs, by means of supporting both investment in rehabilitation and sustainable maintenance of existing structures. The proposed Program addresses these items regarding the main roads network (§2.3 and §2.4). Complementing this effort, an integrated approach to agricultural roads will be addressed as part of the Agricultural Diversification Program, GY-L1007, currently under preparation. Most Bank programs also support Guyana's global, regional and domestic integration efforts. This Program together with the Support for Competitiveness and the Agricultural Diversification programs jointly address the main pillars of the Bank's country strategy.

## **2. The Bank's Sector Strategy**

- 1.37 The Bank's involvement in the development of road infrastructure to date has comprised i) long-term capital investments aimed at the rehabilitation of infrastructure (road and related structures) that has fulfilled its service life expectancy, ii) extension of the road network, iii) support of regional and international integration projects and iv) improvement of road safety conditions. This strategy, in concurrence with the country's sector strategy, aims to improve and expand the road network, while assuring its technical, financial, socio-environmental and economic sustainability.
- 1.38 The Bank, following this long-term strategy, has been financing major rehabilitation works along most of the main road network (§1.12 and §1.13) and has contributed to develop and improve sustainable routine maintenance mechanisms with the introduction of the RMMS, covering most of the rehabilitated network. Bank operations also include provisions for the future financing of maintenance of the road network (§1.17 to §1.21). The operations supporting rehabilitation of roads and structures comprise either explicit road safety components or implicit activities for safety improvements (§1.22 to §1.24).

## **H. Program's Strategy**

- 1.39 The present Program will replace, rehabilitate and maintain existing critical highway infrastructure that has reached its economic life expectancy, and improve driving and road safety conditions along the main road network.
- 1.40 The rehabilitation and improvement of culverts and roads that have completed their economic life expectancy, in some of the most important regions of Guyana, will reduce overall road transportation costs along the main road network and improve

driving and safety conditions.(¶1.7). The replacement of structures along the Timehri - Rosignol corridor, and the rehabilitation of the Black Bush Polder Road will contribute to the promotion of permanent accessibility, improved road safety, and reduction of transportation costs along some of the most heavily populated and productive areas in Guyana.

- 1.41 The routine maintenance of the main roads allows for the extension of their life expectancy, delays road deterioration and investment requirements for rehabilitation or reconstruction, prevents significant vehicle operational costs increases, and reduces the need for recurrent costs to finance periodic maintenance. The performance based contracts for routine maintenance activities implemented by GOG have been successful in preserving the infrastructure and attracting qualified local contractors (¶1.19 and ¶1.20).

## **I. Coordination with other donors**

- 1.42 Three other donors have been active in the road transportation sector: the World Bank, the European Commission (EC) and the Caribbean Development Bank (CDB). The EC recently financed a comprehensive national transportation study, among the key recommendations was the high priority that should be given to the continuous maintenance of existing transport infrastructure. The CDB is financing the upgrade of heavily congested roads. Coordination with other donors was not needed for execution of this program.

## **II. THE PROGRAM**

### **A. Objectives**

- 2.1 The main objective of the Program is to promote permanent accessibility and safety along the main national road network (¶1.39).
- 2.2 Specific objectives of the Program will be the improvement of the road network reliability and driving conditions along the Timehri – Rosignol roadway by replacing or rehabilitating existing critical transport infrastructure that has reached its economic life expectancy. Works on this roadway were initiated under the Main Road Rehabilitation and the Bridges Rehabilitation Programs. In addition, the Program will contribute to the strengthening of the ongoing road maintenance activities along the main national road network, implemented through the RMMS, and the improvement of road safety conditions. Both activities have been continuously supported by previous operations of the Bank. Finally the Program includes the rehabilitation of the Black Bush Polder Road, a main road located in one of the significant agricultural areas of the country (¶1.40 and ¶1.41). This Program will allow for reductions in transport and logistical costs, contributing to economic growth and social development.

## B. Description

- 2.3 This Program represents the continuation of the Bridges Rehabilitation Program-Lot 1 (¶1.12). It is designed to provide infrastructure rehabilitation, safety, and maintenance elements that were not included in the earlier operation due to financial constraints, limits of the MPW&C, and price increases due to changes in design standards that contributed to reduce the scope of previous operations (¶1.12).
- 2.4 The Loan, will finance the replacement or rehabilitation of structures and roads, routine maintenance activities, and implement road safety measures along the main roads. The proposed Program will consist of the following main components: 1) Structure Rehabilitation (¶1.12 and ¶1.13); 2) Routine Maintenance (RMMS) (¶1.17 to ¶1.21); 3) Road Safety (¶1.22 to ¶1.25); and 4) Black Bush Polder Road Rehabilitation (¶1.14 to ¶1.16).

## C. Components

### 1. Structure rehabilitation (US\$15.9 million)

- 2.5 Under this component, the Loan will finance the rehabilitation or reconstruction of two Lots of structures. Lot A will be composed of sixty (60) structures, comprising fifty eight (58) culverts and two (2) bridges along the 130 km stretch of roadway and its cost is estimated to be US\$ 9 million. Lot B will be composed of 30 additional similar structures selected from a reassessment of the condition of remaining structures (¶1.12), with an estimated cost of US\$5 million.
- 2.6 The scope of works of Lot A, along the Timehri – Georgetown (TG), Georgetown – Mahaica (GM), and Mahaica – Rosignol (MR) consists of forty culvert structures that will be replaced with reinforced concrete box culverts, and eleven culvert structures that will be replaced with High Density Polyethylene (HDPE) pipe culverts. Seven existing culverts will be backfilled due to recent changes in drainage. Additionally, two pedestrian bridge-walkways will be constructed to be integral to existing bridges. The following table summarizes the scope of the Lot A component in each road segment:

Segment of road	Culverts			Bridges
	Reinforced concrete box	HDPE pipe	Backfill	
Timehri – Georgetown	23	3	4	1
Georgetown – Mahaica	15	8	1	1
Mahaica – Rosignol	2	-	2	-

- 2.7 A number of inspections and tests were carried out for each structure in order to determine their present status. Inspection activities included: i) determination of location and function of each structure; ii) recording of dimensions for each structure; and iii) physical testing of materials.



- 2.8 Based upon lessons learned during the implementation of the Bridges Rehabilitation Program – Lot 1, designs and construction methodology of the structures included in this operation will reflect best practices to minimize any adverse impacts on the road users during the construction period. Standardized precast culverts will be used in lieu of in-situ culverts. The standard designs were rationalized to make precast construction more economical. The same design process as in the New Amsterdam - Moleson Creek Road Rehabilitation Program was used (¶1.33).
- 2.9 The proposed construction comprises new footbridges adjacent to existing structures, new box culverts and headwalls, new concrete pipes plus new headwalls and new HDPE pipes plus headwalls. The ancillary activities that will be carried out during the civil works include temporary works and clean up, earthworks, roadworks, safety works related to the execution of these activities and to the permanent structures (signs, rails, etc.), slope protection activities, etc.
- 2.10 The remaining structures in the Timehri - Georgetown - Mahaica - Rosignol corridor that have not been rehabilitated under Bridges Rehabilitation Program – Lot 1, nor scheduled for rehabilitation under Lot A of this operation, have already been prioritized considering the level of service and structural condition. Lot B will be composed of the top 30 prioritized structures and, based on the average unit costs from Lot A, the estimated cost would be US\$ 5.0 million. A field verification will be concluded to confirm the number of remaining structures to be included in Lot B.
- 2.11 This component includes funding for the supervision of both Lots A and B estimated as US\$ 1.50 million, as well as funding for the preparation of Lot B designs estimated as US\$ 400,000, respectively.

## **2. Routine Maintenance (RMMS) (US\$2.20 million)**

- 2.12 This component will fund the continued support for the RMMS to allow for uninterrupted maintenance of the road network beginning in December 2006 and continuing for 4 additional years under performance-based lump sum contracts (¶1.20). The RMMS is a maintenance management system that provides support to assessment, planning, contracting and managing routine maintenance on a road network. This system includes activities such as repairs to small scale pavement distortions, shoulders, verges, drains, signs and minor damages in structures. Each of these routine maintenance contracts covers all the activities for a specific segment of the road network or, when a segment is subject to more than one contract, similar activities are bundled together. Currently, approximately 330 kilometers, about 70% of the main road network, are covered by maintenance contracts that were developed using the RMMS. The remaining 30% of the network is presently under rehabilitation or in the process of being rehabilitated, under the Mahaica Rosignol Road Rehabilitation and the New Amsterdam-Moleson Creek Road Rehabilitation Programs.

- 2.13 The first routine maintenance contract, awarded in December 2003, is scheduled to expire in November 2006. Subsequent contracts will expire throughout 2007. The following roads are included in the RMMS: i) East Bank Demerara; ii) West Bank Demerara; iii) West Coast Demerara; iv) East Coast Demerara; v) Essequibo Coast Road; and vi) Soesdyke – Linden Road. The annual average routine maintenance contractual cost is estimated at US\$ 2,200 per kilometer (2006 prices), of which GOG will finance the actual routine maintenance activities (75% of the total cost) and the Bank will finance the road safety related activities (25% of the total cost) such as striping, installation of traffic signs and reflectors (¶1.19 and ¶1.23).

### 3. Road safety (US\$2.0 million)

- 2.14 The Road Safety Report of 2003 (¶1.22) recommended a number of engineering and enforcement countermeasures to be implemented in the ten corridors with the worst safety records, such as: i) Pavement marking, sign posting and reflective spikes; ii) Implementation of bus stops; iii) Implementation of street lighting; iv) Construction of sidewalks and drains; v) Pavement widening; vi) Grass cutting and drain cleaning; vii) Rehabilitation or replacement of structures; and viii) Purchase of Police equipment (motor cycles, breathalyzers, radar guns, etc) to support road safety enforcement.
- 2.15 This component of the loan will finance activities initiated under previous loans (¶1.12 and ¶1.13) to improve safety in the main road segments. The following table lists these activities and shows the relationship between main areas of concern and actions undertaken in previous operations.

Road Safety Measures	LO 999/SF	LO 1094/SF	LO 1554/SF	Current Operation
Pavement marking, signing and reflective spikes	✓	✓	✓	✓
Implementation of bus stops				✓
Street lighting	✓	✓	✓	✓
Construction of sidewalks and drains	✓	✓	✓	✓
Pavement widening		✓ <sup>(1)</sup>		
Grass cutting and drain cleaning	✓			✓
Rehabilitation/replacement of structures	✓	✓	✓	✓
Police equipment	✓			✓

(1) Only recommended for this specific road corridor (Mahaica – Rosignol Road)

- 2.16 The following table illustrates the geographical distribution of this component along the main road network. The total financing of this component is US\$ 2.0 million.

Road Safety Measure	Correntyne Highway <sup>(1)</sup>	East Coast Demerara	East Bank Demerara	West Coast Demerara	West Bank Demerara	Linden – Soesdyke	Essequibo Coast
Pavement marking, signing and reflective spikes		✓	✓	✓	✓	✓	✓
Implementation of bus stops		✓	✓	✓	✓	✓	
Street lighting		✓		✓	✓		
Construction of sidewalks and drains			✓				
Grass cutting and drain cleaning <sup>(2)</sup>		✓	✓	✓	✓	✓	✓
Police equipment <sup>(3)</sup>	✓	✓	✓	✓	✓	✓	✓

(1) The road safety elements included under LO 1554/SF, address the identified countermeasures

(2) Included as part of the Routine Maintenance Management System (RMMS) Component

(3) The equipment include: Motor Cycles, Breathalyzers, Radar Guns, etc.

#### 4. Black Bush Polder Road Rehabilitation (US\$3.5 million)

- 2.17 It is anticipated that this component will finance activities that complement GOG's ongoing works. The MPW&C has reviewed both the original designs and the designs prepared for the ongoing activities. As a result of this, the MPW&C requested the following activities to complete the rehabilitation of the road: scarification of existing Double Bituminous Surface Treatment (DBST) and reshaping where required; correction of pavement geometry and leveling by adding 100 mm of crushed stone where required; overlay with 50 mm of asphalt concrete along the road. Straightening of curves, modification of road axis, and widening of section will not be included in the scope of these works. Additionally, traffic safety measures will be incorporated into the works, such as road marking, signing, and delineators.
- 2.18 This component includes funding of US\$ 500,000 for the preparation of final feasibility studies, environmental studies, environmental management plan, and final designs, all requiring the Bank's no-objection, and supervision of the works.

#### D. Cost and financing

- 2.19 Program costs, in thousands of dollars, are summarized in the table below:

**Program Costs**  
(in U.S. thousands of dollars)

	Bank -FSO	GOG	Total
<b>1. Structures Rehabilitation</b>	<b>15,150</b>	<b>750</b>	<b>15,900</b>
a) Structure Rehabilitation – Lot A	9,000	0	9,000
b) Structure Rehabilitation – Lot B	4,250	750	5,000
c) Supervision – Lot A	1,000	0	1,000
d) Supervision – Lot B	500	0	500
e) Studies and designs – Lot B	400	0	400
<b>2. Routine Maintenance (RMMS)<sup>(1)</sup></b>	<b>500</b>	<b>1,700</b>	<b>2,200</b>
Maintenance activities	500	1,700	2,200
<b>3. Road Safety</b>	<b>2,000</b>	<b>0</b>	<b>2,000</b>
Civil works	2,000	0	2,000
<b>4. Black Bush Polder Road Rehabilitation</b>	<b>3,500</b>	<b>0</b>	<b>3,500</b>
a) Civil works	3,000	0	3,000
b) Studies and Supervision	500	0	500
<b>5. Evaluations</b>	<b>350</b>	<b>0</b>	<b>350</b>
<b>6. External Audits</b>	<b>350</b>	<b>0</b>	<b>350</b>
<b>7. Financial Expenditures</b>	<b>650</b>	<b>250</b>	<b>900</b>
a) Interest	400	0	400
b) Commitment Fee	0	250	250
c) Inspection and Supervision	250	0	250
<b>8. Contingencies</b>	<b>1,800</b>	<b>0</b>	<b>1,800</b>
<b>TOTAL</b>	<b>24,300</b>	<b>2,700</b>	<b>27,000</b>
<b>Percent</b>	<b>90%</b>	<b>10%</b>	<b>100%</b>

<sup>(1)</sup> The routine maintenance contractual cost will be fully financed by GOG and will be included as counterpart of this operation. The Bank finances the related safety activities.

### **III. PROGRAM EXECUTION**

#### **A. The borrower and executing agency**

- 3.1 The borrower is the Cooperative Republic of Guyana (GOG). The executing agency is the Ministry of Public Works and Communications (MPW&C) through the Works Services Group (WSG).

#### **B. Program execution and administration**

- 3.2 Within the executing agency, WSG will have the following responsibilities regarding program implementation: a) prepare and obtain Bank approval for all bidding documents required to hire the civil work contractors and supervision firms; b) coordinate the bidding processes according to the Bank and GOG rules; c) monitor the activities of the engineering supervision firm; d) maintain adequate accounting and financial controls as well as appropriate support documentation filing systems for verification by the Bank and the external auditing firm; e) prepare and submit to the Bank disbursement requests and corresponding justification of expenses; f) prepare and submit to the Bank semiannual reports on the revolving fund and program execution, audited financial reports, and other financial reports as required by the Bank; and g) address and resolve contractor claims and address related contract adjustments. In addition, WSG will maintain separate files for the operations of the Program, and allow for financial and accounting monitoring of the Bank resources, and the local counterpart, in accordance with Bank requirements.
- 3.3 To ensure proper execution of the operation, the Borrower through the Executing Agency, must fulfill one prior condition to first disbursement, and several other conditions relating to Structure rehabilitation, Black Bush Polder Road Rehabilitation, Maintenance and Safety. These conditions provide requirements regarding bidding documentation, environmental licenses, vehicle weight scales, feasibility studies, designs and civil works.
- 3.4 Prior to first disbursement of the resources of the Financing, the Executing Agency, through its authorized representatives, must have approved the WSG's Manual of Standard Operating Procedures and must have carried out a workshop to disseminate its contents among the staff involved in the execution of projects.
- 3.5 The bidding documents for the selection of Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- and the Black Bush Polder Road components must incorporate the final technical designs and corresponding Environmental Management Plan previously submitted to the Bank for its non-objection. Lot B designs will be based on the same standards used for Lot A. In addition, prior to issuing the bidding documents for the selection of Contractors to carry out civil works for Lot B of the Structure Rehabilitation component, the Executing Agency will submit to the Bank for no objection the corresponding economic feasibility study. Prior to initiation of the first civil work under each

component of the Program, the Executing Agency will demonstrate to the Bank that the appropriate authority of the Borrower has issued the environmental licenses for all the civil works to be carried out under the particular component. Additionally, prior to initiation of the first civil work for Lot B of the Structure Rehabilitation component, the Executing Agency will submit to the Bank evidence that at least two scales for measuring vehicle weight have been installed and are in operation in the locations of the national roads network identified as those of highest priority in the weight control study financed under LO 1094/SF (¶1.25).

- 3.6 The bidding documents for the selection of the supervisory firms of the civil works relating to both components must incorporate a requirement that the selected firms hire environmental inspectors as part of their field personnel.
- 3.7 The assessment of the RMMS (¶1.21) resulted in several products and recommendations, which will be implemented according to the following timeline:
  - a) Prior to issuing the bidding documents for the selection of the first Contractor to carry out routine maintenance works under the Program, the Executing Agency will demonstrate, to the Bank's satisfaction, that (i) it has approved and implemented a system for the evaluation of the Contractors carrying out routine maintenance work in the national road network and that it has evaluated all contractors then carrying out routine maintenance work in the national road network utilizing that system and (ii) it has updated the existing databases on road condition surveys and on unit costs; and b) The bidding documents for the selection of Contractors to carry out routine maintenance works under the Program must incorporate, as a minimum, (i) the recommendations contained in "The Roadway Maintenance Program and Routine Maintenance Management System - Final Report" issued by the MPW&C in April 2005 and (ii) the roadway maintenance manual.
- 3.8 Prior to issuing the bidding documents for the procurement of road safety equipment for the Guyana Police Force (GPF) the Executing Agency will sign with the Ministry of Home Affairs (¶1.9) a Memorandum of Understanding (MOU) whose text will have been previously approved by the Bank setting forth the parties' responsibilities regarding the activities under the Road Safety component.
- 3.9 The feasibility and environmental studies, and the final designs of the Black Bush Polder Road works will be bundled in the same consultancy. Prior to authorizing the firm to carry out the designs for the rehabilitation or reconstruction works under the Black Bush Polder Road component, the Executing Agency will submit to the Bank's no objection the corresponding economic feasibility studies. In addition, the bidding documents for the selection of Contractors to carry out the civil works under this component must incorporate the final technical designs previously submitted to the Bank for its non-objection.
- 3.10 The contractors who will carry out the civil works for the Structure Rehabilitation - Lots A and B-, and the Rehabilitation of the Black Bush Polder Road, will be overseen by engineering supervision firms hired by the MPW&C with funds from the Financing. The construction contractors will be hired using International

Competitive Bidding (ICB) procedures and in accordance with terms of reference agreed with the Bank. Prior to issuing the bidding documents for the selection of the Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- and the Black Bush Polder Road Rehabilitation components, the Executing Agency will demonstrate, to the Bank's satisfaction, that it has selected and hired the firms to supervise such civil works.

- 3.11 The supervision firms will also carry out the supervision of the environmental and social aspects of the civil works. The supervision firms will be responsible for activities under their TOR, notwithstanding the following direct responsibility to: i) familiarize themselves with designs, ii) propose minor adjustments in the contract before the award is made, iii) establish appropriate inspection, quality assurance/quality control procedures to ensure adequate administration of the construction contracts, and ensure that environmental and social measures, based on the Environmental Management Plan (EMP), are addressed fully by the contractor, iv) approve civil works contract invoices and submit them to the GOG, v) carry out traffic counts and axle load distribution and gather data in four selected fixed locations for evaluation of the structure rehabilitation component, vi) carry out traffic counts and axle load distribution and gather data in two selected fixed locations for evaluation of the BBPR component, and vii) the supervision firm for the rehabilitation of structures shall prepare a manual and procedures to be applied during the routine inspections to the structures including the identification of areas to be inspected, methodologies to carry out the inspections, etc.
- 3.12 The supervision firms will review all technical documentation at the beginning of their contracts and at regular intervals throughout the Program to ensure, *inter alia* the adequacy of the programming of work such as geotechnical and subsurface investigation, drainage, environmental management specifications, including mitigation measures, traffic management, and worker safety recommendations. The supervision firms will verify that contractors staff qualifications (including environmental specialists) and equipment capacity satisfy design requirements to execute the works.
- 3.13 The supervision firms will submit, twice per year, reports to the Executing Agency and the Bank outlining progress in the works carried out by the contractors and will prepare as-built drawings that will also be submitted in digital format, for all work performed upon the completion of each major work component.

### **C. Procurement of goods and services**

- 3.14 In procuring goods and services financed by the Bank, the Executing Agency will follow Bank's procurement policies and procedures. The Executing Agency will use ICB for all goods and services valued at more than US\$ 100,000, for civil works valued at more than US\$ 1 million, and for consulting services in excess of US\$ 100,000. Documentation related to procurement and requests for disbursements will be reviewed ex-ante by the Bank.

- 3.15 A revolving fund of up to 5% of the financing will be set up.

**D. Execution and Disbursement period**

- 3.16 Considering the scope of works that have to be done, and the time of expiration of ongoing routine maintenance contracts, the expected disbursement period of the Program is 60 months from the date of entry into force of the Loan Contract. The following table shows the tentative disbursement schedule, in thousands of US\$.

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB (FSO)	2200	6050	7800	6300	1950	24300
GOG	260	470	620	920	430	2700
Total	2460	6520	8420	7220	2380	27000

**E. Monitoring and evaluation**

- 3.17 The monitoring and evaluation strategy will include the following: i) annual audited financial statements (¶3.18); ii) annual plan of operations (¶3.19); iii) semiannual progress reports, including traffic data and basic statistical information on the transport sector (¶3.20 to ¶3.22); iv) mid-term review (¶3.23); and v) final review (¶3.23).
- 3.18 During program execution, the Executing Agency will submit annual financial statements regarding the Program, audited by a firm of independent public accountants (private audit firm). This firm shall be selected and hired by the Borrower in accordance with Bank policies and procedures, and with terms of reference approved by the Bank. These financial statements will be submitted within the periods set forth in Article 7.03 (iii) of the General Conditions of the Loan Contract.
- 3.19 During the execution of the Program, WSG will submit to the Bank annually, at least thirty (30) days prior to the conclusion of each calendar year, an Annual Operation Plan (AOP), containing, at least the following information for the upcoming calendar year: (i) a list of the expected outputs and activities including a schedule for their implementation, (ii) the procurement plan, and (iii) budget and disbursement projections. In addition, the AOP will include an evaluation of the achievements of the preceding year.
- 3.20 Semiannual progress reports corresponding to the activities carried out during each six-month period must be prepared and submitted to the Bank by the WSG. These reports will contain, at least the following elements: i) descriptions of the executed civil works and general information about the structures, roads and safety works and road maintenance; ii) evaluations of the contractors' and the supervision firm's performances; iii) description of the procurement processes carried out during the reported period; iv) description of the executed works on a monthly basis, with detailed description of quantities and availability of labor, materials and equipment, number and qualifications of workers (skilled and unskilled) actually employed, average monthly road conditions and compliance with the routine maintenance contract and detailed unit costs and budget compliance; v) updated inventory and

evaluation of the condition of the rehabilitated structures at the end of the reported period; vi) evaluation of the maintenance plan at the end of the reported period; vii) execution plan for structures and road works to be completed in the following two six month periods; viii) maintenance plan for the following two six month periods, with the justification of the type of activities, schedule of works, identified priorities and physical (labor, equipment and materials) and financial requirements; ix) a summarized project financial statement, and x) the estimated cash flow for the next two six month periods.

- 3.21 Twice a year, during a period of 7 days (for fourteen hours per day) traffic counts and axle load distribution will be carried out in selected fixed locations on the national road network (¶3.11). These counts will take into account low and high agricultural seasons. In addition, every second Thursday of each month, traffic counts and axle load distribution will be carried out during the full day, in the same selected fixed locations. The data will be collected by the supervision firms in four selected fixed locations along the Timehri – Rosignol road, and in two selected fixed locations along the Black Bush Polder Road, and will be submitted to the Bank twice a year, together with the semi-annual progress reports.
- 3.22 The Executing Agency will commence reporting statistical information on the transport sector to the Bank in the first semi-annual report of 2009. The plan to develop a comprehensive set of sector statistics includes the consolidation of data currently being collected by the transport subsectors. The Mahaica Rosignol Road Loan, LO-1094/SF-GY, included resources for institutional strengthening of the WSG to support data collection of the road subsector. The Moleson Creek-New Amsterdam Road Loan, LO 1554/SF-GY, included resources for institutional strengthening of the Central Transport Planning Unit to support assembling information collected by the remaining subsectors (air, marine, etc.).
- 3.23 When the disbursement of the Loan has achieved 40%, or the committed funds reach 50%, whatever happens first, and when the disbursement of the loan has achieved 90%, the Borrower shall submit to the bank sufficient information to allow the Bank to review: a) the impacts produced by the program execution; b) procurement procedures and results for goods, services, consultancies and civil works, and c) progress on the implementation of WSG's Manual of Standard Operating Procedures.
- 3.24 The MPW&C will collect, store and retain all necessary information, environmental and social performance reviews, indicators and parameters, including the semi-annual plans, the mid-term review, and final evaluations, in order to assist: i) the Bank to prepare the Project Completion Report (PCR); and ii) the Bank's Oversight Evaluation Office (OVE), if so wishes, to evaluate the impact of this operation, in accordance with GN-2254-5.

#### **IV. VIABILITY AND RISKS**

- 4.1 No technical, environmental, financial or socio-economic obstacles to proper implementation of this operation have been identified. To the fullest extent



possible, anticipated issues have been considered in designing the Program so as to maximize benefits and reduce unexpected costs to a reasonable minimum.

**A. Institutional viability**

- 4.2 The WSG was created in 2002 to be responsible for management of the public road investments and maintenance activities performed by the MPW&C. At present, WSG constitutes a core technical unit of the MPW&C. The WSG since its creation executed and managed IDB projects in a satisfactory manner. In 2004, using funds from the New Amsterdam-Moleson Creek Road Rehabilitation Program, WSG was the beneficiary of a strengthening process oriented to expand its functions to the planning of transport investments. Since its creation, WSG demonstrated its improved project implementation capacity that is clearly reflected in the sustained level of annual disbursements (₱1.10 to ₱1.13). The level of disbursements in the last few years has averaged US\$ 15 million, which is similar to the expected future disbursements.
- 4.3 WSG's institutional and operational capacity to manage and implement this operation according to the IDB standards was assessed by means of the Institutional Capacity Assessment System (ICAS) and the Risk Assessment (RA).

**1. Institutional capacity assessment**

- 4.4 The ICAS system bases its analysis on a set of questionnaires regarding standard operational issues that generate a computerized model of the institutional operation. The ICAS assessment recommended using the WSG as the Project Executing Unit for this Program. The level of institutional development of the WSG and the level of risk that could affect the execution of the operation are in both cases qualified as moderate according to the ICAS methodology.
- 4.5 Improvements to administrative and internal controls were recommended to improve WSG's operational efficiency, to strengthen its institutional capacity, and to ensure its reliability. These actions were incorporated into the TOR of an ongoing consultancy to prepare a Manual of Standard Operating Procedures for the WSG. The manual will focus on four goals: a) improving institutional planning and management system; b) strengthening procurement unit; c) documenting and formalizing administrative procedures; and, d) improving internal control and audit capacity (₱3.3).

**2. Risk assessment**

- 4.6 A risk assessment has been completed to identify possible problem areas related to the execution of the Program. The highest risk areas identified were the possible delays in the procurement process and the possibility that bidding prices exceed the budget. Lower risk areas identified in the assessment included MPW&C capacity to monitor contractors, and communication and coordination with the utilities that occupy the same road reserve. In addition to the aforementioned risk areas, traffic

management is a likely risk area for this Program since the main construction works would be undertaken along a highly populated region.

**B. Technical viability**

- 4.7 The technical feasibility of the Program has been established on the basis of the review of available studies, designs and specifications. The bidding documents and the construction contracts will include the environmental guidelines and mitigation measures set forth in the Environmental Studies, as well as all principal studies on engineering, soils, materials, pavements, drainage, and structures. The budget includes funds for contracting internationally reputable supervision firms to supplement local expertise in managing projects of this scope (¶2.19, and ¶3.10 to ¶3.13).
- 4.8 The execution schedule takes into account previous experiences, the nature of the works to be financed, and the amount of time required to carry out the bidding process. MPW&C has already received informal expressions of interest from international firms for some of the key components of the Program.
- 4.9 *Structure rehabilitation.* In early 2005, Guyana experienced extreme floods that resulted in the declaration of a national disaster by the GOG. Although the combination of extended heavy rainfall, malfunctioning drainage systems and high tides contributed to the accumulation of 3 to 5 feet of water in some areas, no structural damage, displacement or erosion was observed on and around the structures rehabilitated by the previous operations. For the present operation, designs have been improved and associated cost estimates have been evaluated before selecting the proposed construction methodology. The use of standard precast structures has been found to be feasible both in terms of construction cost and impact on traffic during construction stages (¶1.33, ¶4.14, 4.15, and ¶4.17). Additionally, the activities financed by this operation will include the preparation of manuals and procedures for inspection of structures and monitoring (¶3.11).
- 4.10 *Continued implementation of the RMMS.* The RMMS program has been in place since December 2003. An assessment of the Roadway Maintenance Program and the RMMS conducted in 2005 identified areas of improvement of the system, and proposed instruments to address them (¶1.21). The implementation of these recommendations is incorporated into the special conditions for this component, as well as the update of the road survey condition and unit costs database.
- 4.11 *Road safety.* The road safety report of 2003 (¶1.22) assessed the worst road corridors and recommended measures, some of which have been implemented in ongoing operations (¶1.23 and ¶1.24). This loan will finance additional road safety activities in the main road segments.
- 4.12 *Black Bush Polder Road.* The MPW&C requested the Bank to finance additional activities to the ones being executed by GOG, including scarification of the existing DBST, the correction of geometry leveling and an overlay of 50 mm of asphalt concrete (¶2.17). A final economic evaluation of the proposed works, the

preparation of designs and environmental analyses (including an Environmental Management Plan) will be conducted and submitted to the Bank for no-objection prior to the execution of the works (¶3.9).

### **C. Economic viability**

- 4.13 *Background.* During the preparation of the Bridges Rehabilitation Program (¶1.12), the economic feasibility study of Lot 1 structures along the Timehri – Rosignol roadway took into account benefits derived from reduced vehicle operating costs (VOC) and time-savings of vehicle operators and passengers. The study, carried out in 1997, considered costs and benefits of each structure as well as the overall program. The results indicated that the overall net present value (NPV) of Lot 1 was US\$ 93.5 million. Consequently, the economic feasibility study for Lot 1 was positive and robust. The structures to be rehabilitated under the present Program required an updated economic feasibility analysis, as some of the assumptions that were considered in the study of 1997 likely would have changed.
- 4.14 *Methodology.* The economic analysis of Lot A structure rehabilitation considered two different approaches in calculating the possible benefits of the Project. An estimate has been made of the time savings, or benefits, that would be required for each structure in order to achieve a 12% economic internal rate of return (IRR) over each corridor, followed by an estimate of the amount users are willing to pay, or cost, for a 12% IRR. This method is equivalent to computing the long run marginal costs (LRMC) of the bridges, which is most appropriately calculated by computing the average incremental cost (AIC). The economic feasibility study demonstrated a high probability that the Project is economically feasible.
- 4.15 An estimate was made of the time savings required to achieve an IRR of 12% due to the improvements of each individual structure. The estimates did not include savings from user vehicle operating costs or unforeseen interruptions in traffic due to unexpected structural failures, and therefore the results underestimate the benefits to some extent. The time savings required for a 12% IRR along each corridor ranged from less than 2 minutes for the Mahaica-Georgetown (MG) and Rosignol-Mahaica (RM) segments to slightly over four minutes for the Timehri-Georgetown (TG) road. These time savings are reasonable and consistent with what may be expected to occur.
- 4.16 The second approach consisted of calculating the AIC of each structure and to examine what is a reasonable amount users would be willing to pay for permanent, uninterrupted and efficient transportation along the improved roadway. If the AIC lies below what the users would be willing to pay, that is, if this value is less than the perceived benefits to the user allowing for an IRR of 12%, then the Project is economically feasible.
- 4.17 *Results.* The total cost over time per vehicle (AIC) of having an improved and reliable system of culverts and bridges is \$0.08 for MG, \$0.05 for MR, and \$0.20 for TG (cost per structure is 0.3 cents, 2.4 cents and 0.6 cents respectively). Each

user is already incurring transport costs of \$8 for MG, \$9 for MR, and \$13 for TG. The additional costs are considered reasonable since they represent between 0.4% and 2.2% of the current transport costs.

- 4.18 Sensitivity analyses were performed for time savings and AIC. The tables below show various scenarios, including worst cases for time savings to achieve 12%IRR and for AIC. The analyses verified the robustness of the Project.

Corridor	Time Required to be Saved for 12% IRR (in minutes)				
Scenario	Base Case	Investment Costs Increased 20%	Growth Rates Reduced to 0%/yr.	User Time Decreased 25%	Cost, Rates and Time Changed Simultaneously
MG	1.72	2.06	2.14	2.29	3.42
TG	4.18	5.01	5.20	5.57	8.32
RM	1.43	1.72	1.78	1.91	2.85

Corridor	Average Incremental Cost (AIC) (in cents)			
Scenario	Base Case	Investment Costs Increased 20%	Growth Rates Reduced to 0%/yr.	Cost & Rates Changed Simultaneously
MG	7.99	9.58	9.94	11.93
TG	19.57	23.49	24.37	29.25
RM	4.80	5.76	5.98	7.17

- 4.19 *Least Cost Alternative Considerations.* In order to reduce the delays and extensive traffic congestion, rehabilitation designs use precast structures rather than *in situ* casting that was done in the Lot 1 program was proposed. Comparable costs of the approaches indicated that costs of the precast approach are more expensive than the *in situ*. Nevertheless, when taking into consideration the user savings from reduced delays inherent in precasting, precasting proves to be the least cost alternative.
- 4.20 *Black Bush Polder Road.* An economic evaluation of the Black Bush Polder Road was carried out, based on the preliminary designs (¶1.15). Considering that these preliminary designs have been revised by GOG, and since some rehabilitation works are currently ongoing (¶1.16), both the traffic studies and the economic feasibility of the proposed activities to be financed by this Program have to be revised. The no-objection from the Bank to the final economic evaluation is incorporated into the special conditions for this component (¶2.18 and ¶3.9).

#### **D. Financial viability**

- 4.21 GOG's financial strategy for managing its road infrastructure relies on two financial sources: i) External resources to finance capital investments, these include both infrastructure rehabilitation and improvement within the main network (LO999/SF-GY, LO1094/SF-GY, and LO 1554/SF-GY), and ii) Internal Recurrent resources to finance maintenance and improvement activities. The CDB is completing the financing of the upgrading of two semi-urban roads to four lanes. The EU has contributed to sector studies but no investment program has been structured upon financing from this institution. Hence the Bank is foreseen to be

the only and most significant source of financing for road infrastructure in the medium term (¶1.42). The abovementioned ongoing operations and the present Program will provide the projected resources for investments in the road network.

- 4.22 The resulting financial consequences of this strategy are: i) debt-servicing costs related to the loans, and ii) a portion of recurrent costs required to sustain the investments into the long term.
- 4.23 *Debt-servicing.* Under the last IMF-supported PRGF Program (expired in September 2006; discussions on a new facility are expected to begin in early December 2006), a threshold of 250% has been established for the ratio of disbursed external debt to revenue. The ratio of disbursed debt to revenues is expected to peak just below the 205% ratio in 2011, declining thereafter. Although the country remains at moderate risk of debt distress, the threshold already incorporates this Program and therefore the approval of this loan will not affect debt sustainability beyond the agreed benchmark (¶1.5 and ¶1.6).
- 4.24 *Recurrent costs.* Funding for the local counterpart of this Program will come directly from the central government budget. The availability of counterpart funding has not presented an obstacle to project execution in Guyana in recent years. Projected disbursements of the counterpart for this loan have been incorporated into the PSIP of Guyana. The PSIP forecasts an annual commitment of US\$5 million for the next 5 years for the national road program.
- 4.25 The rehabilitation and maintenance of the main road network by these funds have resulted in improved road conditions, and shifted the network's needs from periodic to routine maintenance. Hence, the main road network financial requirements for the routine maintenance can be covered with no additional burden on GOG's future budget allocations.

#### **E. Environmental and social viability**

- 4.26 This program includes two main civil work components: rehabilitation of structures, grouped in Lot A and Lot B, and the rehabilitation of the Black Bush Polder Road. Designs for the structures and an Environmental Management Plan (EMP), have been completed as part of the preparation for Lot A; Lot B will have an EMP prepared during the design of structures stage; finally, Black Bush Polder Road will also have a complete EMP prepared during the design stage of the road. The EMPs will be submitted to the Bank for their no objection prior to the bidding process. The Structure Rehabilitation - Lot A is considered socially and environmentally viable. The EMP provides the measures to comply with adequate standards for traffic control and management, water and waste management, and the minimization of environmental and social impacts associated with the construction activities, and the improvement of the construction methodology for structures. Prior to initiation of the first civil work under each component of the Program, the Executing Agency will demonstrate, to the Bank's satisfaction that

the appropriate authority has issued the environmental licenses for all the civil works to be carried out under the particular component (¶3.5).

- 4.27 The potential positive socio-environmental impacts of the Program are: i) improved access to markets and social services by reduced travel time and transport costs, ii) reduction of the potential negative impact of local and sub-regional flooding to residential, agricultural and business properties by improving road traffic and safety conditions and enhanced storm water management, and iii) increased safety for pedestrians, road users, and a reduction in the number, occurrence, and severity of accidents.
- 4.28 The negative environmental and social impacts of the Program are likely to be restricted to the immediate area of the road and limited to the construction period. Given the characteristics of the proposed civil works, as well as the fact that they will take place within the existing right-of-way and will not affect the resident population, the potential negative impacts are: i) traffic congestion, creation of hazardous driving conditions and temporary obstruction of access to community services and residential and commercial areas; ii) soil erosion with possible sedimentation of nearby water bodies, resulting from earth movement from excavation and construction waste; iii) soil and water contamination due to waste and effluents coming from work areas or equipment yards; iv) generation of dust, noise and gases by the operation of construction activity, equipment and vehicles; v) risk of accidents for workers or road users around construction sites; and vi) accidental rupture of utility pipes and lines (electricity, telephone, and water), including 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 (¶4.32, ¶4.35 and ¶4.36).
- 4.29 The Guyana Environmental Protection Agency (EPA) is responsible for promoting the effective management of the natural environment. The EPA is also responsible for issuing an environmental permit for any project that may significantly affect the environment, based on the approval of an Environmental Impact Assessment (EIA). An EIA for the Bridges Rehabilitation Program assessed the Project's area of influence and the potential environmental impacts, including an EMP for the corresponding structures. In 1999, the EPA issued the MPW&C an Environmental Permit for the Bridges Rehabilitation Program, and a construction permit to implement Lot 1 structures.
- 4.30 During the implementation of Lot 1 the Contractor did not always treat traffic management with the promptness that was deemed necessary. Therefore, by applying lessons learned to the design of the present Program, WSG promoted the following adjustments: i) replacement of all in situ culverts with pre-cast culverts, which require shorter construction periods and improves sequencing of work; and ii) amendment of the tender documentation to address Contractors' responsibilities in issues of traffic diversions, traffic management and utility relocation. All civil works, including cofferdams and temporary diversion roads will be developed

within the right of way of the existing roads, not requiring expropriations. All culverts will be built in one step and according to each site one of the following methods will be implemented: (i) diversion of existing drainage to another nearby canal; or (ii) diversion of drainage through temporary pipe-culverts or temporary bridges spanning over canals. In every case the contractor prior to commencement of the works must present for approval utility relocation, specific drainage and traffic management plans.

- 4.31 During project preparation, an EMP for Lot A was developed based on the results of the EIA developed in the first phase and a site visit; results of public consultations; meetings with environmental and national transport agencies and review of available Project studies and designs. The EMP provided general and specific conditions to be incorporated during the pre-construction, construction, and post-construction periods. The EMP provides general procedures for supervisory oversight, coordination, liaison, monitoring and reporting, with specific emphasis during pre-construction and construction activities until civil works are completed and roads open to the public. As a condition prior to approval of tender documents, the MPW&C will ensure that the EMP is included in the bidding documents, and provisions are included for contractors to adopt and implement the Plan. The Plan consists of the following components:
- 4.32 ***Impact mitigation.*** The bidding documents for the selection of Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- must incorporate the Environmental Management Plan (EMP), previously submitted to the Bank for its non-objection, containing the General and Particular Environmental Specifications and the provisions on the mitigation, management, supervision and monitoring of environmental impacts and on the training by the supervision firm of staff (from the Executing Agency, the Supervision firms and the Contractors) on environmental and social management. To avoid, prevent and mitigate anticipated negative environmental and social impacts from the Program, the following specific measures and activities must be implemented: a) Activities to be followed during pre-construction, construction, and post-construction periods (e.g., fuel management, erosion control, water management, dust control, construction yard and pre-casting facility, traffic management, workers training, health and safety, etc.); b) Waste management procedures for solid waste, hazardous waste and demolition debris; c) Emergency response procedures, including spills management and a contingency plan; d) Procedures to be followed during operation (e.g., maintenance, vegetation clearing, road safety, drainage systems monitoring system, etc.). In addition to a description of the actions to be taken, the EMP also provides, based on the phase of the project: 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. In addition, the Contractors will be required to hire Environmental Specialists as part of their field personnel.

- 4.33 ***Supervision and Monitoring.*** Supervision, inspection and enforcement of the EMP will involve the participation of the WSG's environmental engineer, the supervision firm, the contractor and the EPA. The MPW&C will contract, with the resources of the Financing, international supervision firms that will provide internationally-experienced environmental inspectors, who will be assisted by locally-contracted environmental inspectors. The environmental inspectors will oversee contractors' compliance with environmental mitigation and management specifications, and provide training to MPW&C, WSG and Contractors' staff. EPA will receive semi-annual reports and any other reports prepared in relation to environmental management, including emergencies that may occur (e.g. spills of hazardous substances). A Social and Environmental Monitoring Program will be initiated during the construction phase and will be continued throughout the operation phase. Monitoring will be carried out to ensure the environmental viability of construction activities, compliance with the EMP, including the need for a traffic management plan applicable to each location, and proper follow-up during maintenance. Monitoring of soil quality, vegetation health, traffic control and management, and level of interference with residential and business activities will be carried out.
- 4.34 ***Training.*** The Supervisory Engineer will provide training to the following groups: i) WSG's Environmental Engineer and MPW&C senior staff: training on basic environmental management and procedures for managing EMPs; ii) Construction Contractors' personnel will be trained on: environmental management, environmental emergency response, materials handling, waste material management and application of environmental mitigation and management specifications; iii) MPW&C and WSG staff, Construction Contractors' Environmental Specialists will be trained on: 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 will be trained on: implementation of the EMP, and basics of emergency response, spills control, hazardous materials handling and management, and traffic management. The above training will be included in the supervision firms' budgets.
- 4.35 ***Lot B Structures.*** During the studies and design stage of Lot B structures (¶3.5 and ¶4.32), an EMP will be prepared based on the activities developed for Lot A, and its recommendations will be included in the corresponding bidding documents for the selection of contractors to carry out the civil works. In addition, the no-objection from the Bank on the EMP will be a condition prior to the commencement of the bidding process. The bidding documents for the selection of supervisory firms of the civil works of Lot B component must incorporate, as a minimum, a requirement that the selected firm hires an Environmental Inspector as part of their field personnel. The bidding documents for the selection of Contractors to carry out the civil works must incorporate the requirement that the selected contractor hires an Environmental Specialist as part of their field personnel.



- 4.36 *Black Bush Polder Road Rehabilitation*. During the preparation of the New Amsterdam-Moleson Creek loan an Environmental and Social Impact (ESI), dated July 2004, was produced addressing several road segments, including the BBP, on which works were to be carried out following a prioritization exercise. During the studies and design stage of BBPR (¶3.9), an EMP will be prepared. The bidding documents for the selection of the supervision firm for this component must incorporate, as a minimum, a requirement that the selected firm hires an Environmental Inspector as part of their field personnel. The bidding documents for the selection of Contractors to carry out the civil works under this component must incorporate: i) the EMP, previously submitted to the Bank for its non-objection, containing the General and Particular Environmental Specifications and the provisions on the mitigation, management, supervision and monitoring of environmental impacts and on the training of staff (from the Executing Agency, the Supervision firms and the Contractors) on environmental and social management, and ii) the requirement that the selected contractor hires an Environmental Specialist as part of their field personnel.

#### **F. Benefit and beneficiaries**

- 4.37 The Program will have a positive impact upon the urban, semi-urban and rural population of Guyana. As a result of the Program, the physical, operational and safety conditions of the road segments will be improved, including ongoing maintenance procedures, resulting in the following positive contributions to socio-environmental quality: i) *traveling public*: travel time and economic costs will be reduced as a result of delays reductions; safety in private and public vehicles and truck transport will be increased; per-kilometer cost of vehicle operation and emissions in local air pollution will be reduced as traffic will move more smoothly with the decrease of stop and go traffic and congestion; ii) *pedestrians*: safety in built-up areas and in proximity to schools, hospitals and markets will be increased as a consequence of widening the bridges and their approaches, and paving the shoulders; iii) *traveling public and residents*: the number and severity of vehicle-to-vehicle and vehicle-to pedestrian accidents will be reduced; stress and noise levels will decrease; and iv) *agricultural producers and residents*: movement of products to markets and transport services to hospital and schools will be more efficient; storm water management will be improved due to improvements of drainage systems, reducing impacts of local and sub-regional flooding and erosion and sedimentation processes.

#### **G. Risks**

- 4.38 The process of preparing the Risk Assessment (RA) (¶4.3) involved review of material, drafting of a questionnaire, interviewing stakeholders, and identification and analysis of key problems (¶4.6). In conjunction with the PPMRs, the Annual Operative Plan and the Risk Assessment, a Supervision Plan for continuous follow up of risks throughout the execution of the Program will be developed and include the following mitigation strategy for the identified risks. (¶4.39 to ¶4.43)

- 4.39 The risk of procurement delays was associated with the institutional weaknesses of the former CTB. With the Bank's assistance and additional support from the Canadian International Development Agency (CIDA), the World Bank and the Caribbean Regional Technical Assistance Center (IMF/CARTAC) the procurement processes were updated and relevant regulations and procedures are being developed; new Fiscal Management, Procurement and Audit Acts were approved; a new National Procurement and Tender Administration Board (NPTAB) has been created, although the members of its corresponding constitutional oversight body have not yet been appointed. These measures contribute to mitigate this risk.
- 4.40 Due to the possibility of delays, claims, and cost overruns, performance based lump-sum procedures accepted by the MPW&C and implemented in previous and ongoing Programs will be adopted in this operation for the rehabilitation of structures, routine maintenance contracts, and the rehabilitation of the BBPR. However, based on the lessons learned from the New Amsterdam-Moleson Creek Road Rehabilitation Programs, the lump -sum methodology will be adjusted to allow for unit price variations by the introduction of an adjustment formula methodology (§1.12, §1.13 and §1.26 to §1.29).
- 4.41 Another risk to the successful execution of the Program derives from the weakness of the MPW&C capacity to monitor contractors. WSG will continue to act as the project executing unit, within the MPW&C. The WSG's shortcomings identified in the institutional assessment and the RA report are not substantial and may be addressed in a short period of time following the recommendations contained in the RA's action plan and in the preparation of a Manual of Standard Operating Procedures (§3.3). The adoption of the Manual of Standard Operating Procedures will be a condition precedent to first disbursement of the Financing. Although WSG's capacity to monitor and coordinate contractors has not posed a difficulty in the execution of previous operations, it will be continuously assessed by the Bank by means of the Supervision Plan (§4.38).
- 4.42 Communication and coordination with the utility companies and traffic control, diversion and management have been areas of concern identified since the early implementation of the Bridges Rehabilitation Program. Significant progress was made during the execution of that Program in terms of coordinating activities and schedule of works, setting up procedures for communications and meetings before execution of works and at the time of utility reconnection. The bidding documents and the Environmental Management Plan were revised to make unambiguous specifications regarding the procedures to be adopted for coordination with utility companies and traffic control, and the level of performance required.
- 4.43 In addition to managing traffic disruptions through definitions in the bidding documents, the structures rehabilitation of Lots A and B include pre-cast construction methodology to reduce construction periods and to improve the sequencing of works reducing traffic disruptions to a minimum. Traffic control, diversion and management measures will be implemented in the construction sites, as stated in the EMP.

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ANNEX I: Logical Framework

ANNEX II: Procurement Plan

APPENDIX: Proposed Resolution

Electronic Links and References	
Basic Socioeconomic Data	<a href="http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata">http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata</a>
Status of Loan in Execution & Loans Approved	<a href="http://portal.iadb.org/approvals/pdfs/GYen.pdf">http://portal.iadb.org/approvals/pdfs/GYen.pdf</a>
Tentative Lending Program	<a href="http://opsgsl/ABAPRJ/tentativelending.ASP?S=GY&amp;L=EN">http://opsgsl/ABAPRJ/tentativelending.ASP?S=GY&amp;L=EN</a>
Information available in the files of RE3	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=720791">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=720791</a>
Annex III: Project Performance Monitoring Report	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=730509">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=730509</a>
Map	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=739496">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=739496</a>

## ABBREVIATIONS

AIC	Average Incremental Cost
AOP	Annual Operation Plan
BBPR	Black Bush Polder Road
CARTAC	Caribbean Regional Technical Assistance Center
CDB	Caribbean Development Bank
CIDA	Canadian International Development Agency
CTB	Central Tendering Board
DBST	Double Bituminous Surface Treatment
EC	European Commission
E-HIPC	Enhanced Highly Indebted Poor Countries
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESI	Environmental and Social Impact
GDP	Gross Domestic Product
GM	Georgetown - Mahaica
GOG	Government of the Cooperative Republic of Guyana
GPF	Guyana Police Force
HDPE	High Density Polyethylene
ICAS	Institutional Capacity Assessment System
ICB	International Competitive Bidding
IDB	Inter-American Development Bank
IIRSA	Initiative for Regional Infrastructure Integration in South America
IMF	International Monetary Fund
IRR	Internal Rate of Return
LRMC	Long Run Marginal Cost
MDRI	Multilateral Debt Relief Initiative
MOU	Memorandum of Understanding
MPW&C	Ministry of Public Works and Communications
MR	Mahaica - Rosignol
NPV	Net Present Value
NPTAB	National Procurement and Tender Administration Board
OVE	Oversight Evaluation Office
PPMR	Project Performance Monitoring Report
PRGF	Poverty Reduction and Growth Facility
PSIP	Public Sector Investment Program
RA	Risk Assessment
RDC	Regional Democratic Councils
RMMS	Routine Maintenance Management System
TG	Timehri – Georgetown
VOC	Vehicle Operating Cost
WB	World Bank
WSG	Works Services Group
WTP	Willingness to Pay

**PROGRAM SUMMARY**  
**TRANSPORT INFRASTRUCTURE REHABILITATION PROGRAM**  
**(GY-L1008)**

<b>Financial Terms and Conditions <sup>1</sup></b>			
<b>Borrower:</b> The Cooperative Republic of Guyana		<b>Amortization Period:</b> 40 years	
<b>Executing Agency:</b> Ministry of Public Works and Communications		<b>Grace Period:</b> 10 years	
		<b>Disbursement Period:</b> 5 years	
<b>Source</b>	<b>Amount (million)</b>	<b>%</b>	<b>Interest Rate:</b> 1% during grace period, 2% thereafter
IDB (FSO)	24.30	90%	<b>Supervision &amp; Inspection Fee:</b> 1.00%
Local	2.70	10%	
Other/Cofinancing	-	-	<b>Credit Fee:</b> 0.50%
Total	27.00	100%	<b>Currency:</b> US Dollars
<b>Program at a Glance</b>			
<p><u>Program objective:</u> The goal of the Program is to promote permanent accessibility and safety along the main national road network. Specific objectives of the Program will be the improvement of the road network reliability and driving conditions along the Timehri – Rosignol roadway by replacing or rehabilitating existing critical structures; the improvement of road safety conditions, and strengthening of the ongoing road maintenance activities along the main national road network. Finally, the Program includes the rehabilitation of the Black Bush Polder Road, a main road located in one of the significant agricultural areas of the country.</p> <p><u>Special contractual clauses:</u></p> <p>Prior to first disbursement, approval of WSG's Manual of Standard Operating Procedures (¶3.4).</p> <p>Bidding documents for the selection of Contractors must incorporate: a) the Environmental Management Plan (¶3.5, ¶4.32, ¶4.35and ¶4.36), b) the final technical designs (¶3.5 and ¶3.9), and c) the requirement to hire Environmental Specialists (¶3.12, ¶4.32, ¶4.34 ¶4.35and ¶4.36).</p> <p>Bidding documents for the selection of supervision firms must incorporate the requirement to hire Environmental Inspectors (¶3.6, ¶4.33, ¶4.35and ¶4.36).</p> <p>Prior to issuing bidding documents for selecting Contractors, select and hire supervision firms (¶3.10).</p> <p>Prior to authorizing the designs for the works under the Black Bush Polder Road component, submit for Bank's no objection the economic feasibility studies (¶3.9).</p> <p>Prior to initiation of the first civil work, corresponding environmental licenses issued (¶3.5 and ¶4.26).</p> <p>Prior to initiation of Lot B of the Structure Rehabilitation component, at least two scales for measuring vehicle weight have been installed and are in operation (¶3.5).</p> <p>Prior to issuing the bidding documents for the selection of the first Contractor to carry out routine maintenance works: (i) approve and implement a system for the evaluation of the Contractors carrying out routine maintenance work in the national road network and evaluate all contractors then carrying out routine maintenance work in the national road network utilizing that system and (ii) update the existing databases on road condition surveys and on unit costs (¶3.7).</p> <p>Bidding documents for the selection of routine maintenance contractors must incorporate: i) the recommendations contained in the "The Roadway Maintenance Program and Routine Maintenance Management System - Final Report" issued by the MPW&amp;C in April 2005; and ii) the roadway maintenance manual (¶3.7).</p> <p>Prior to issuing the bidding documents for the procurement of road safety equipment the Executing Agency will sign with the Ministry of Home Affairs a Memorandum of Understanding (¶3.8).</p> <p>Prior to issuing the bidding documents for the selection of Contractors to carry out civil works for lot B of the Structure Rehabilitation component, submit for Bank's no objection the economic feasibility study (¶3.5).</p>			
Exceptions to Bank policies: None			
Program consistent with Country Strategy: Yes [ X ] No [ ]			
Program qualifies for: SEQ [No] PTI [No] Sector [ ] Geographic [ ] Headcount [ ]			
Procurement: See Paragraph: ¶3.14			
Verified by CESI on: April 14 2006			

## **I. FRAME OF REFERENCE**

- 1.1 This program will support the ongoing strategy of rehabilitation or replacement of existing critical highway infrastructure that has completed its economic life expectancy. In addition the program promotes the continuity of road maintenance and traffic safety activities. This scope of works will contribute to the reliability of the road network, the reduction of transportation costs and the improvement of driving and safety conditions.

### **A. Socioeconomic framework**

- 1.2 In recent years Guyanese authorities have maintained macroeconomic stability under successive IMF programs, with low inflation and a stable exchange rate. The economy grew by just 0.2% on average from 1998 to 2005. Guyana reached the Completion Point under the Enhanced Highly Indebted Poor Countries (E-HIPC) Initiative in 2004, reducing the country's external debt by more than half in relation to its level at the end of 1998. Although the level of debt is still high and the country is vulnerable to shocks that could increase the debt-to-revenue ratio, it is important to note that the most recent analysis of debt sustainability, by the IMF and World Bank, projects the debt-to-revenue ratio to be in a manageable range during the period of execution of the Program. With the Multilateral Debt Relief Initiative (MDRI), the debt relief ratio was estimated at 217% at the end of 2005, and is expected to fall before peaking again at 205% in 2011. Guyana's debt service indicators remain below the respective thresholds, suggesting that debt service payments are manageable.
- 1.3 The Fifth Review under the IMF Poverty Reduction and Growth Facility (PRGF) completed in January 2006 found only limited room for additional borrowing over the next four years and highlighted the need for the Government of Guyana (GoG) to reduce spending to restore fiscal balance. The PRGF Arrangement expired in September 2006, discussions on a new facility are expected to begin in early December 2006. However, IDB-financed investment operations already included in the Public Sector Investment Program (PSIP), including this operation, will not be affected.

### **B. Infrastructure in the Transport Sector**

- 1.4 The road network of Guyana totals 3,995 km, 500 of which are paved, and serves a national fleet of about 52,000 vehicles. The six main national paved roads have two lanes, except for segments along the East Bank and East Coast Demerara, which have four lanes. Guyana's ground transport system depends heavily upon the reliability of its bridges and culverts along the road network. Much of the Atlantic coastal lands are below mean sea level making necessary a dense system of drains, canals and sluices to permit habitation and agriculture. Most of these waterways run perpendicular to the shoreline and consequently must be crossed by the main roads, substantially increasing construction and maintenance costs of the road network. The majority of the most populated area is located in these regions.

- 1.5 Although the road network is one of the sparsest in South America, most of the population have access to paved roads, since both the concentration of the population and the road systems are located in the coastal areas. Over the last 10 years GOG has embarked on progressive rehabilitation of the roadways and structures along these roads. Yet the road network in the interior is short and in bad condition, consisting mainly of roads easily accessible only during the dry season and limited to 4wd drive vehicles. Overall, the transport system is supported by a network providing inadequate rural and international connections and highly congested roads in urban areas with poor quality and costly transport services (ferries and buses).

### **C. Institutional framework in the Transport Sector**

- 1.6 Government responsibilities in the transportation sector are spread among various agencies, with the Ministry of Public Works and Communication (MPW&C) having the central role. The MPW&C is basically responsible for transport policy and the provision and maintenance of almost all major transport infrastructures. The Ministries of Agriculture, Housing and Water, and Local Government assume the responsibility for providing and maintaining some local road infrastructure while the Ministry of Home Affairs assumes some regulatory functions regarding safety and security of transport services.
- 1.7 As part of the strategy for the institutional strengthening of the MPW&C supported by the Bank, the Works Services Group (WSG) was created in 2002 as a project unit within the MPW&C, specifically designed to manage and implement public investment programs in road infrastructure. The operational cost of the WSG is financed in full with budgetary funds from GOG.
- 1.8 WSG's primary responsibilities include the execution of three IDB loan contracts: Bridges Rehabilitation Program (LO-999/SF), Mahaica Rosignol Road Rehabilitation Project (LO-1094/SF), and New Amsterdam-Moleson Creek Road Rehabilitation Project (LO-1554/SF), minor road and bridge design and maintenance, and planning and coordination of governmental transport investments. Other responsibilities include acting as executing agency for the Initiative for Regional Infrastructure Integration in South America (IIRSA) activities, assignments related to right-of-way works, in-house designs for forced account works, GOG funded capital works, and lending general engineering advice to several local authorities and institutions responsible for infrastructure projects.

### **D. Bank's experience**

#### **1. Road and structure rehabilitation**

- 1.9 Three ongoing operations from the Bank are funding the rehabilitation of roads and related bridges and culverts. The Bridges Rehabilitation Program originally envisaged the rehabilitation of 284 structures along the road segment from Timehri to Rosignol. During its preparation, structures were prioritized into two lots. Designs and cost estimates were completed for a sample of 57 structures (Lot 1).

The estimated construction cost for the sample was US\$ 7.7 million, while the projected construction cost for all the structures was US\$ 14.7 million. In 2001, the MPW&C modified the designs, resulting in new cost estimates for Lot 1 of US\$ 13.8 million. Of the two firms that were prequalified, the bid ranked first had a tender price for Lot 1 of US\$ 22.7 million. Following the tendering of works for Lot 1, the construction methods and designs were reviewed, and the scope of the contract was expanded to include the construction or rehabilitation of approximately thirty additional structures originally prioritized into Lot 2 at no additional cost. The final scope of the works included the rehabilitation of 81 structures, the contract for which was completed during May 2005. Implementation of the operation reached 67% disbursement by September 2004 and has remained at that level since then<sup>1</sup>. The structures not included were reassessed and prioritized, resulting in the structures to be included in this Program.

- 1.10 The Bank approved the loan to finance the Mahaica Rosignol Road Rehabilitation Program in November 2001, and works started in May 2003 on various sections of the Mahaica - Rosignol roadway. By March 2006, 88% of the resources of the Loan had been disbursed. Additionally, the Bank approved the New Amsterdam – Moleson Creek Road Rehabilitation loan in June 2004. Due to diverse reasons, among which recognizable factors are the limited supply of construction inputs, price volatility experienced regionally, and high cost of importing equipment, the original contracting of civil works for the New Amsterdam-Moleson Creek Program resulted in excessively high bidding prices. In order to mitigate these increases in tender prices, the works were re-tendered, with the implementation of mechanisms built into the contract to reflect price fluctuations, with adequate clauses to prevent run away price escalation. The mechanism utilized bills of quantities and treated non-critical drainage structures and bridges as provisional items in order to reach baseline prices. The resulting tender prices were approximately 15% below those received in the previous process and were still above the budget. However, the tender prices for the road works and critical drainage structures and bridges were 18% below the budget and one of the two Lots has been awarded on this basis. It is anticipated that the second lot would be awarded shortly.

## **2. Black Bush Polder road**

- 1.11 The Black Bush Polder Road (BBPR) consists of a loop road off the Correntyne Highway, serving the large communities of Yakusari, Joanna, Mibikuri and Lesbeholden. This area is one of the largest agricultural zones in Guyana, where the main production includes rice, fruits and vegetables. Some important rice processing plants are included in the area. BBPR, a corridor of approximately 34.8 km in length that links the villages to the Correntyne Highway, is the only means of transporting products out of the area. The roadway is almost entirely flat except where it crosses the area's main drainage channels on raised wooden structures.

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<sup>1</sup> Remaining disbursement is for US\$ 10.5 million out of US\$ 41 million corresponding to the construction of the access roads to the Berbice River Bridge. GOG received proposals to construct such bridge in November 2005.



- 1.12 The “New Amsterdam - Moleson Creek Road Rehabilitation Project - Rural Feeder Road” design and feasibility study assessed the rehabilitation of the BBPR, together with the evaluation of the New Amsterdam - Moleson Creek Road. The studies proposed a full depth reconstruction for approximately 80 % of the road with an estimated cost of US\$13.3 million. Those original reconstruction designs of the BBPR developed during 2004 involved reconstruction and widening to all sections of the roadway from 4.5 to 6.5 meters. The designs recommended removing the existing base, excavating to full width, recompact the embankment and placing a new asphalt surface. Additionally, the designs included the replacement of the 14 existing wooden bridges with new concrete structures. Bank review of the study concluded that the proposed project was not feasible at the level of the investment envisioned. Subsequent revised studies, culminating with an investment of US\$6 million were also deemed not feasible.
- 1.13 Revised designs were adopted by GOG and a first stage of works is currently being financed by the GOG. According to GOG’s revised designs, several sections of the pavement have failed while other areas have deteriorated and developed cracks, depressions, and potholes. In some areas there has been deterioration of the road shoulder while in others there has been excessive vegetation. All of the fourteen bridges along this roadway required repairs. The GOG’s current rehabilitation activities include: correcting failed pavement areas with crushed stones; sealing surface cracks; scarifying and reshaping existing pavement; grading and shaping existing shoulders, and rebuilding clay shoulders along selected areas. Additionally the superstructures (deck, support members and curbs) of 14 bridges and the substructures (recapping of deteriorated concrete pier caps) of 3 bridges are being repaired or replaced.

### **3. Routine maintenance**

- 1.14 The MPW&C is responsible for maintenance of national paved roads, including routine maintenance activities. Expenditures by the MPW&C for routine maintenance of national paved roads have averaged US\$ 0.62 million per year. The Bridges Rehabilitation Program included resources for the development and installation of a computerized Road Maintenance Management System (RMMS), which was implemented during 2003 and 2004.
- 1.15 The RMMS is an integrated system of procedures designed to assist in the decision-making, planning, organizing, monitoring, controlling and implementing of roadway maintenance activities. The system is made up of various inter-dependent components that include roadway evaluation data collection, a database that contains technical information on the roadway and the roadway condition, roadway distress identification, resource needs and an analysis system. This information allows to prioritize and make cost-effective decisions on maintenance, plan maintenance activities, determine resource requirements including costs, monitor maintenance activities and costs, maintain a pre-determined level of service and to prepare preliminary, interim and final reports on the ongoing and completed maintenance activities.

- 1.16 The analyses and evaluation of the information collected from the field identification (walking survey) of the roadway distresses/defects has resulted in the determination of prioritized maintenance needs for any given section length and of the minimum and optimum budget allocations. Requirements for minimum standards have been estimated, using the RMMS, at US\$ 0.7 million (2003 prices), and in fact executed for approximately US\$ 1,500/km. The RMMS software also generates reports on many aspects of the roadway maintenance program, among the most important ones are the complete set of tender documents including the Bill of Quantities for the required maintenance work and the Engineering Estimate for the proposed maintenance activities.
- 1.17 The WSG is using the RMMS to manage the roadway routine maintenance program of the MPW&C. A multi-year performance-based fixed price (lump-sum) contract has been adopted for the roadway maintenance program. The contractor is paid for work output and quality of performance rather than for work input as in contracts based on unit prices. The contractor is allowed to select the materials and work methods to complete the maintenance according to standards established in the contract, and thus responsibility for quality and scheduling rests with the contractor. The first routine maintenance contract was awarded in December 2003, works started in January 2004, and will be completed by November 2006. Subsequent contracts were awarded during 2004 and will be completed during 2007. Continuous support of the road system through implementation of routine maintenance has been a priority for GOG and the Bank. Works have focused on routine maintenance activities financed by GOG, and road safety activities financed by the Bank, in the most traveled corridors of the paved road system, resulting in most of these roads being in fair condition. Unpaved roads are not covered by the RMMS and are generally in poor conditions.
- 1.18 The loan for Mahaica Rosignol Road Rehabilitation Program has financed an evaluation of the development and implementation of the RMMS. This assessment, completed in 2005, has identified the areas for improvement, and developed recommendations and measures to address those needs. As part of the assessment, the following has been developed: a manual for road maintenance, a system to evaluate contractors, a review of the bidding documents and proposed changes, and a training program to increase the expertise and number of regional personnel, engineers and technicians from the MPW&C and other roadway agencies involved with the RMMS.

#### **4. Road Safety**

- 1.19 According to a 2003 road safety study financed by Loan 999/SF-GY, Guyana has an average of 2,872 accidents per year, resulting in 170 fatalities and a motor vehicle registration ratio of one vehicle per fifteen people. The total number of fatalities is approximately 0.059 per number of accidents, almost 15 times greater than the index corresponding to developed economies. This study identified ten corridors with the worst conditions regarding road safety, and developed a road safety strategy to address the main concerns. The improvement of road safety and

the implementation of this strategy have been a long-standing priority for GOG and the Bank. Activities included in the three IDB programs address road safety needs by financing pavement markings and signs, street lighting, construction of sidewalks, and acquisition of road safety related equipment for the police, among other activities.

- 1.20 The focus of the road safety component of the Bridges Rehabilitation Program is on properly signing and marking 400 km of the main road network and installing safety features such as sidewalks in urbanized areas as well as street lighting at intersections. The road marking and signing aspects of this component were combined with the activities under the RMMS and the selected maintenance contractors were given the task to install and maintain the highway safety measures (¶1.17). Highway safety features have been incorporated into eight maintenance contracts currently in progress. Four contracts for the construction of sidewalks have been completed. In addition, two contracts for street lighting have already been completed. Activities under the Mahaica Rosignol Road Rehabilitation and New Amsterdam-Moleson Creek Road Rehabilitation Programs have similar scope and cover other specific road segments.
- 1.21 Components such as marking, signing and reflective spikes; street lighting; construction of sidewalks and drains; and rehabilitation and replacement of structures, have been incorporated in the three ongoing operations. Grass cutting, drain cleaning, and acquisition of police equipment were incorporated into the Bridges Rehabilitation Program. Pavement widening was included in the Mahaica Rosignol Road Rehabilitation Program as this corridor was the only one with such a recommendation.

## **5. Weight control**

- 1.22 The Mahaica - Rosignol Road Rehabilitation Program includes a weight control component to safeguard the road investments being financed. The component includes the review of the existing weight limits to meet international standards, and it contemplates penalties for overloading vehicles and mandatory compliance by vehicle operators with weight limits. This component also includes the installation of six permanent weigh scales at key locations of the national paved road system. Several portable units will be procured and used for random checks of axle loads. At present, GOG has drafted the Terms of Reference, evaluation criteria and contract documents for the hiring of the consultant to undertake the weight control study, prior to installation of the weigh scales. The procurement of the consultant is currently in progress. The weight control program component is scheduled for completion by December 2007.

## **6. Contracting arrangements**

- 1.23 Previous unit price contracts in Guyana have allocated most or all of the risk to the public sector. As a result, the WSG has implemented the performance-based lump-sum modality for road and bridge construction and supervision (¶1.9 and ¶1.10).

Lump sum rehabilitation and maintenance bidding procedures are most common in developed countries. These procedures have also been designed and implemented in Bank projects in Ecuador under loans 1057/OC-EC and 1138/OC-EC, with success.

- 1.24 The introduction of lump-sum contracts in rehabilitation and maintenance of infrastructure requires the preparation of precise designs, specifications and quantity estimates. During the tendering process, the bidders conduct a thorough design review of all the plans and specifications before submittal of their proposals. In the final stage review with the selected contractor after justified design errors have been corrected, the contractor accepts all design conditions, quantities, specifications and drawings, so as to prevent claims for design errors or extra time during execution, which could have resulted in cost overruns. The inclusion of this design review stage in the projects using lump sum contracts does not eliminate all design errors, however the system as used is workable given that contingencies are incorporated for design changes.
- 1.25 The Guyanese experience with the lump-sum construction and supervision contract modality includes the airstrip and terminal rehabilitation of the Cheddi Jagan International Airport, part of the Air Transport Reform Program (LO-1042/SF), completed according to contractual budget and timetable; the Mahaica-Rosignol rehabilitation works and the routine maintenance contracts currently under implementation.
- 1.26 The Mahaica Rosignol Road Rehabilitation Program supports cost reliability, cost overrun restrictions and minimization of delays, in terms of using performance-based lump-sum investment and maintenance contracts for contractors and supervisors. It also includes the resources to evaluate the results of using lump-sum contracts in Guyana. Among them, an ex post evaluation was designed to improve the collaboration among all stakeholders and to improve cost reliability and cost effectiveness of road and bridge investment and maintenance projects. The New Amsterdam-Moleson Creek Program includes resources to evaluate the RMMS, lump sum investment, maintenance contracts, quality control procedures, institutional quality assurance of WSG, and social/environmental aspects of investment and maintenance contracts. Given the current status of these two operations, these evaluations have not taken place yet.

## **E. Lessons learned**

- 1.27 During the 1990s, projects from all donors faced major implementation delays and cost overruns that have resulted from the difficulty of GOG to comply in a reasonable time with the conditions precedent to loan disbursement and to conclude contractual activities. The fragmentation of contracts was considered a major source of delays and cost overruns, as it seemed that small contracts did not attract well-qualified bidders. The execution of World Bank-funded Essequibo Road Project and IDB's Main Roads Rehabilitation Program (LO-890/SF) faced problems with claims from contractors and delays, resulting in final costs and

execution period increases due to modifications of the scope of the works, price variations being contractually allowed, and major redesign of activities.

- 1.28 Since then three initiatives were introduced: the creation of WSG (¶1.7), the development of the RMMS (¶1.15) and the implementation of lump sum contracts (¶1.25). The creation of WSG has produced good results in the execution (¶1.9 and ¶1.10) and cost control areas. WSG successfully concluded designs and bidding documents for routine maintenance, and contracted performance-based fixed-cost contracts to maintain 330 Km of roads in accordance with the RMMS (¶1.16, ¶1.17 and ¶1.20). In terms of financial sustainability of maintenance works, the GOG has committed itself to fund the expenditures required to achieve the minimum level of routine maintenance works determined by the RMMS, whose inventory has grown to cover 500 km of roads.
- 1.29 Ongoing IDB projects (Bridges Rehabilitation, Mahaica Rosignol Road Rehabilitation, and New Amsterdam-Moleson Creek Road Rehabilitation) have supported the above initiatives (¶1.9 and ¶1.10) by financing WSG's institutional strengthening, 3-year maintenance contracts with the private sector, and the bundling of activities into sufficiently large, partial or full performance-based lump-sum contracts.
- 1.30 Recent projects have incorporated technical/design elements that increase the timeliness and improved the quality of road and bridge construction. The New Amsterdam - Moleson Creek Road Rehabilitation Program incorporates standard designs for culverts, as well as precast construction methodology (¶1.10). Considering the significant period of time required to build in situ structures, the excessive traffic delays, and the need to dewater the area during the construction of the structures, the use of precast elements will reduce the need for temporary works, construction time and consequently mitigate the delays in traffic.

#### **F. The country's sector strategy**

- 1.31 The country's strategy for the road subsector consists of i) rehabilitation, improvement and extension of the road network, financed by external resources, and ii) routine maintenance of the rehabilitated network, implemented by the RMMS, and financed by recurrent resources. This strategy aims to reduce transportation costs, improve market access and overall competitiveness, and increase coverage of maintenance activities of main roads, bridges and other infrastructure. Guyana has been actively restoring infrastructure that in most cases has exceeded its life service, improving traveling conditions and road safety along public roads (¶1.9 and ¶1.10). Maintenance programs include the involvement of the private sector by means of contracting out continuous routine maintenance activities of existing infrastructure, as well as the strengthening of MPW&C's capacity to administer and maintain the road network through the development of a more comprehensive maintenance management system (¶1.14 to ¶1.18). This strategy is in line with the recommendations of the Transport Sector Study (¶1.39).

## **G. The Bank's strategy**

### **1. The Bank's country strategy**

- 1.32 The Bank's strategy in Guyana, expressed in the Country Paper (GN-2228), seeks to achieve medium-term poverty reduction, while simultaneously addressing chronic institutional and human resources problems, which must be alleviated in order for the country to achieve sustainable, equitable long term growth. The strategy promotes growth oriented programs and policies, which will contribute to poverty reduction in Guyana.
- 1.33 To achieve the Bank's strategy, policies and investments have addressed i) sustainable economic growth, ii) improved governance and public sector efficiency, and iii) strengthening of social programs. Bank activities focus on an improvement of trade, competitiveness, investment and business environment for private sector development. Since the early preparation stages of the Support for Competitiveness program (GY-L1006), road infrastructure was identified as a major issue in achieving reductions in transport costs, by means of supporting both investment in rehabilitation and sustainable maintenance of existing structures. The proposed Program addresses these items regarding the main roads network (¶2.3 and ¶2.4). Complementing this effort, an integrated approach to agricultural roads will be addressed as part of the Agricultural Diversification Program, GY-L1007, currently under preparation. Most Bank programs also support Guyana's global, regional and domestic integration efforts. This Program together with the Support for Competitiveness and the Agricultural Diversification programs jointly address the main pillars of the Bank's country strategy.

### **2. The Bank's Sector Strategy**

- 1.34 The Bank's involvement in the development of road infrastructure to date has comprised i) long-term capital investments aimed at the rehabilitation of infrastructure (road and related structures) that has fulfilled its service life expectancy, ii) extension of the road network, iii) support of regional and international integration projects and iv) improvement of road safety conditions. This strategy, in concurrence with the country's sector strategy, aims to improve and expand the road network, while assuring its technical, financial, socio-environmental and economic sustainability.
- 1.35 The Bank, following this long-term strategy, has been financing major rehabilitation works along most of the main road network (¶1.9 and ¶1.10) and has contributed to develop and improve sustainable routine maintenance mechanisms with the introduction of the RMMS, covering most of the rehabilitated network. Bank operations also include provisions for the future financing of maintenance of the road network (¶1.14 to ¶1.18). The operations supporting rehabilitation of roads and structures comprise either explicit road safety components or implicit activities for safety improvements (¶1.19 to ¶1.21).

## **H. Program's Strategy**

- 1.36 The present Program will replace, rehabilitate and maintain existing critical highway infrastructure that has reached its economic life expectancy, and improve driving and road safety conditions along the main road network.
- 1.37 The rehabilitation and improvement of culverts and roads that have completed their economic life expectancy, in some of the most important regions of Guyana, will reduce overall road transportation costs along the main road network and improve driving and safety conditions.(¶1.4). The replacement of structures along the Timehri - Rosignol corridor, and the rehabilitation of the Black Bush Polder Road will contribute to the promotion of permanent accessibility, improved road safety, and reduction of transportation costs along some of the most heavily populated and productive areas in Guyana.
- 1.38 The routine maintenance of the main roads allows for the extension of their life expectancy, delays road deterioration and investment requirements for rehabilitation or reconstruction, prevents significant vehicle operational costs increases, and reduces the need for recurrent costs to finance periodic maintenance. The performance based contracts for routine maintenance activities implemented by GOG have been successful in preserving the infrastructure and attracting qualified local contractors (¶1.16 and ¶1.17).

## **I. Coordination with other donors**

- 1.39 Three other donors have been active in the road transportation sector: the World Bank, the European Commission (EC) and the Caribbean Development Bank (CDB). The EC recently financed a comprehensive national transportation study, among the key recommendations was the high priority that should be given to the continuous maintenance of existing transport infrastructure. The CDB is financing the upgrade of heavily congested roads. Coordination with other donors was not needed for execution of this program.

# **II. THE PROGRAM**

## **A. Objectives**

- 2.1 The main objective of the Program is to promote permanent accessibility and safety along the main national road network (¶1.36).
- 2.2 Specific objectives of the Program will be the improvement of the road network reliability and driving conditions along the Timehri – Rosignol roadway by replacing or rehabilitating existing critical transport infrastructure that has reached its economic life expectancy. Works on this roadway were initiated under the Main Road Rehabilitation and the Bridges Rehabilitation Programs. In addition, the Program will contribute to the strengthening of the ongoing road maintenance

activities along the main national road network, implemented through the RMMS, and the improvement of road safety conditions. Both activities have been continuously supported by previous operations of the Bank. Finally the Program includes the rehabilitation of the Black Bush Polder Road, a main road located in one of the significant agricultural areas of the country (¶1.37 and ¶1.38). This Program will allow for reductions in transport and logistical costs, contributing to economic growth and social development.

## **B. Description**

- 2.3 This Program represents the continuation of the Bridges Rehabilitation Program-Lot 1 (¶1.9). It is designed to provide infrastructure rehabilitation, safety, and maintenance elements that were not included in the earlier operation due to financial constraints, limits of the MPW&C, and price increases due to changes in design standards that contributed to reduce the scope of previous operations (¶1.9).
- 2.4 The Loan, will finance the replacement or rehabilitation of structures and roads, routine maintenance activities, and implement road safety measures along the main roads. The proposed Program will consist of the following main components: 1) Structure Rehabilitation (¶1.9 and ¶1.10); 2) Routine Maintenance (RMMS) (¶1.14 to ¶1.18); 3) Road Safety (¶1.19 to ¶1.22); and 4) Black Bush Polder Road Rehabilitation (¶1.11 to ¶1.13).

## **C. Components**

### **1. Structure rehabilitation (US\$15.9 million)**

- 2.5 Under this component, the Loan will finance the rehabilitation or reconstruction of two Lots of structures. Lot A will be composed of sixty (60) structures, comprising fifty eight (58) culverts and two (2) bridges along the 130 km stretch of roadway and its cost is estimated to be US\$ 9 million. Lot B will be composed of 30 additional similar structures selected from a reassessment of the condition of remaining structures (¶1.9), with an estimated cost of US\$5 million.
- 2.6 The scope of works of Lot A, along the Timehri – Georgetown (TG), Georgetown – Mahaica (GM), and Mahaica – Rosignol (MR) consists of forty culvert structures that will be replaced with reinforced concrete box culverts, and eleven culvert structures that will be replaced with High Density Polyethylene (HDPE) pipe culverts. Seven existing culverts will be backfilled due to recent changes in drainage. Additionally, two pedestrian bridge-walkways will be constructed to be integral to existing bridges.
- 2.7 A number of inspections and tests were carried out for each structure in order to determine their present status. Inspection activities included: i) determination of location and function of each structure; ii) recording of dimensions for each structure; and iii) physical testing of materials.
- 2.8 Based upon lessons learned during the implementation of the Bridges



Rehabilitation Program – Lot 1, designs and construction methodology of the structures included in this operation will reflect best practices to minimize any adverse impacts on the road users during the construction period. Standardized precast culverts will be used in lieu of in-situ culverts. The standard designs were rationalized to make precast construction more economical. The same design process as in the New Amsterdam - Moleson Creek Road Rehabilitation Program was used (¶1.30).

- 2.9 The proposed construction comprises new footbridges adjacent to existing structures, new box culverts and headwalls, new concrete pipes plus new headwalls and new HDPE pipes plus headwalls. The ancillary activities that will be carried out during the civil works include temporary works and clean up, earthworks, roadworks, safety works related to the execution of these activities and to the permanent structures (signs, rails, etc.), slope protection activities, etc.
- 2.10 The remaining structures in the Timehri - Georgetown - Mahaica - Rosignol corridor that have not been rehabilitated under Bridges Rehabilitation Program – Lot 1, nor scheduled for rehabilitation under Lot A of this operation, have already been prioritized considering the level of service and structural condition. Lot B will be composed of the top 30 prioritized structures and, based on the average unit costs from Lot A, the estimated cost would be US\$ 5.0 million. A field verification will be concluded to confirm the number of remaining structures to be included in Lot B.
- 2.11 This component includes funding for the supervision of both Lots A and B estimated as US\$ 1.50 million, as well as funding for the preparation of Lot B designs estimated as US\$ 400,000, respectively.

## **2. Routine Maintenance (RMMS) (US\$2.20 million)**

- 2.12 This component will fund the continued support for the RMMS to allow for uninterrupted maintenance of the road network beginning in December 2006 and continuing for 4 additional years under performance-based lump sum contracts (¶1.17). The RMMS is a maintenance management system that provides support to assessment, planning, contracting and managing routine maintenance on a road network. This system includes activities such as repairs to small scale pavement distortions, shoulders, verges, drains, signs and minor damages in structures. Each of these routine maintenance contracts covers all the activities for a specific segment of the road network or, when a segment is subject to more than one contract, similar activities are bundled together. Currently, approximately 330 kilometers, about 70% of the main road network, are covered by maintenance contracts that were developed using the RMMS. The remaining 30% of the network is presently under rehabilitation or in the process of being rehabilitated, under the Mahaica Rosignol Road Rehabilitation and the New Amsterdam-Moleson Creek Road Rehabilitation Programs.
- 2.13 The first routine maintenance contract, awarded in December 2003, is scheduled to

expire in November 2006. Subsequent contracts will expire throughout 2007. The following roads are included in the RMMS: i) East Bank Demerara; ii) West Bank Demerara; iii) West Coast Demerara; iv) East Coast Demerara; v) Essequibo Coast Road; and vi) Soesdyke – Linden Road. The annual average routine maintenance contractual cost is estimated at US\$ 2,200 per kilometer (2006 prices), of which GOG will finance the actual routine maintenance activities (75% of the total cost) and the Bank will finance the road safety related activities (25% of the total cost) such as striping, installation of traffic signs and reflectors (¶1.16 and ¶1.20).

### 3. Road safety (US\$2.0 million)

- 2.14 The Road Safety Report of 2003 (¶1.19) recommended a number of engineering and enforcement countermeasures to be implemented in the ten corridors with the worst safety records, such as: i) Pavement marking, sign posting and reflective spikes; ii) Implementation of bus stops; iii) Implementation of street lighting; iv) Construction of sidewalks and drains; v) Pavement widening; vi) Grass cutting and drain cleaning; vii) Rehabilitation or replacement of structures; and viii) Purchase of Police equipment (motor cycles, breathalyzers, radar guns, etc) to support road safety enforcement.
- 2.15 This component of the loan will finance activities initiated under previous loans (¶1.9 and ¶1.10) to improve safety in the main road segments. The following table lists these activities and shows the relationship between main areas of concern and actions undertaken in previous operations.

Road Safety Measures	LO 999/SF	LO 1094/SF	LO 1554/SF	Current Operation
Pavement marking, signing and reflective spikes	✓	✓	✓	✓
Implementation of bus stops				✓
Street lighting	✓	✓	✓	✓
Construction of sidewalks and drains	✓	✓	✓	✓
Pavement widening		✓ <sup>(1)</sup>		
Grass cutting and drain cleaning	✓			✓
Rehabilitation/replacement of structures	✓	✓	✓	✓
Police equipment	✓			✓

(1) Only recommended for this specific road corridor (Mahaica – Rosignol Road)

- 2.16 The following table illustrates the geographical distribution of this component along the main road network. The total financing of this component is US\$ 2.0 million.

Road Safety Measure	Correntyne Highway <sup>(1)</sup>	East Coast Demerara	East Bank Demerara	West Coast Demerara	West Bank Demerara	Linden – Soesdyke	Essequibo Coast
Pavement marking, signing and reflective spikes		✓	✓	✓	✓	✓	✓
Implementation of bus stops		✓	✓	✓	✓	✓	
Street lighting		✓		✓	✓		
Construction of sidewalks and drains			✓				
Grass cutting and drain cleaning <sup>(2)</sup>		✓	✓	✓	✓	✓	✓
Police equipment <sup>(3)</sup>	✓	✓	✓	✓	✓	✓	✓

(1) The road safety elements included under LO 1554/SF, address the identified countermeasures

(2) Included as part of the Routine Maintenance Management System (RMMS) Component

(3) The equipment include: Motor Cycles, Breathalyzers, Radar Guns, etc.

#### 4. Black Bush Polder Road Rehabilitation (US\$3.5 million)

- 2.17 It is anticipated that this component will finance activities that complement GOG's ongoing works. The MPW&C has reviewed both the original designs and the designs prepared for the ongoing activities. As a result of this, the MPW&C requested the following activities to complete the rehabilitation of the road: scarification of existing Double Bituminous Surface Treatment (DBST) and reshaping where required; correction of pavement geometry and leveling by adding 100 mm of crushed stone where required; overlay with 50 mm of asphalt concrete along the road. Straightening of curves, modification of road axis, and widening of section will not be included in the scope of these works. Additionally, traffic safety measures will be incorporated into the works, such as road marking, signing, and delineators.
- 2.18 This component includes funding of US\$ 500,000 for the preparation of final feasibility studies, environmental studies, environmental management plan, and final designs, all requiring the Bank's no-objection, and supervision of the works.

#### D. Cost and financing

- 2.19 Program costs, in thousands of dollars, are summarized in the table below:

**Program Costs**  
(in U.S. thousands of dollars)

	<b>Bank -FSO</b>	<b>GOG</b>	<b>Total</b>
<b>1. Structures Rehabilitation</b>	<b>15,150</b>	<b>750</b>	<b>15,900</b>
a) Structure Rehabilitation – Lot A	9,000	0	9,000
b) Structure Rehabilitation – Lot B	4,250	750	5,000
c) Supervision – Lot A	1,000	0	1,000
d) Supervision – Lot B	500	0	500
e) Studies and designs – Lot B	400	0	400
<b>2. Routine Maintenance (RMMS)<sup>(1)</sup></b>	<b>500</b>	<b>1,700</b>	<b>2,200</b>
Maintenance activities	500	1,700	2,200
<b>3. Road Safety</b>	<b>2,000</b>	<b>0</b>	<b>2,000</b>
Civil works	2,000	0	2,000
<b>4. Black Bush Polder Road Rehabilitation</b>	<b>3,500</b>	<b>0</b>	<b>3,500</b>
a) Civil works	3,000	0	3,000
b) Studies and Supervision	500	0	500
<b>5. Evaluations</b>	<b>350</b>	<b>0</b>	<b>350</b>
<b>6. External Audits</b>	<b>350</b>	<b>0</b>	<b>350</b>
<b>7. Financial Expenditures</b>	<b>650</b>	<b>250</b>	<b>900</b>
a) Interest	400	0	400
b) Commitment Fee	0	250	250
c) Inspection and Supervision	250	0	250
<b>8. Contingencies</b>	<b>1,800</b>	<b>0</b>	<b>1,800</b>
<b>TOTAL</b>	<b>24,300</b>	<b>2,700</b>	<b>27,000</b>
<b>Percent</b>	<b>90%</b>	<b>10%</b>	<b>100%</b>

<sup>(1)</sup> The routine maintenance contractual cost will be fully financed by GOG and will be included as counterpart of this operation. The Bank finances the related safety activities.

### **III. PROGRAM EXECUTION**

#### **A. The borrower and executing agency**

- 3.1 The borrower is the Cooperative Republic of Guyana (GOG). The executing agency is the Ministry of Public Works and Communications (MPW&C) through the Works Services Group (WSG).

#### **B. Program execution and administration**

- 3.2 Within the executing agency, WSG will have the following responsibilities regarding program implementation: a) prepare and obtain Bank approval for all bidding documents required to hire the civil work contractors and supervision firms; b) coordinate the bidding processes according to the Bank and GOG rules; c) monitor the activities of the engineering supervision firm; d) maintain adequate accounting and financial controls as well as appropriate support documentation filing systems for verification by the Bank and the external auditing firm; e) prepare and submit to the Bank disbursement requests and corresponding justification of expenses; f) prepare and submit to the Bank semiannual reports on the revolving fund and program execution, audited financial reports, and other financial reports as required by the Bank; and g) address and resolve contractor claims and address related contract adjustments. In addition, WSG will maintain separate files for the operations of the Program, and allow for financial and accounting monitoring of the Bank resources, and the local counterpart, in accordance with Bank requirements.
- 3.3 To ensure proper execution of the operation, the Borrower through the Executing Agency, must fulfill one prior condition to first disbursement, and several other conditions relating to Structure rehabilitation, Black Bush Polder Road Rehabilitation, Maintenance and Safety. These conditions provide requirements regarding bidding documentation, environmental licenses, vehicle weight scales, feasibility studies, designs and civil works.
- 3.4 Prior to first disbursement of the resources of the Financing, the Executing Agency, through its authorized representatives, must have approved the WSG's Manual of Standard Operating Procedures and must have carried out a workshop to disseminate its contents among the staff involved in the execution of projects.
- 3.5 The bidding documents for the selection of Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- and the Black Bush Polder Road components must incorporate the final technical designs and corresponding Environmental Management Plan previously submitted to the Bank for its non-objection. Lot B designs will be based on the same standards used for Lot A. In addition, prior to issuing the bidding documents for the selection of Contractors to carry out civil works for Lot B of the Structure Rehabilitation component, the Executing Agency will submit to the Bank for no objection the corresponding economic feasibility study. Prior to initiation of the first civil work under each

component of the Program, the Executing Agency will demonstrate to the Bank that the appropriate authority of the Borrower has issued the environmental licenses for all the civil works to be carried out under the particular component. Additionally, prior to initiation of the first civil work for Lot B of the Structure Rehabilitation component, the Executing Agency will submit to the Bank evidence that at least two scales for measuring vehicle weight have been installed and are in operation in the locations of the national roads network identified as those of highest priority in the weight control study financed under LO 1094/SF (¶1.22).

- 3.6 The bidding documents for the selection of the supervisory firms of the civil works relating to both components must incorporate a requirement that the selected firms hire environmental inspectors as part of their field personnel.
- 3.7 The assessment of the RMMS (¶1.18) resulted in several products and recommendations, which will be implemented according to the following timeline:
  - a) Prior to issuing the bidding documents for the selection of the first Contractor to carry out routine maintenance works under the Program, the Executing Agency will demonstrate, to the Bank's satisfaction, that (i) it has approved and implemented a system for the evaluation of the Contractors carrying out routine maintenance work in the national road network and that it has evaluated all contractors then carrying out routine maintenance work in the national road network utilizing that system and (ii) it has updated the existing databases on road condition surveys and on unit costs; and b) The bidding documents for the selection of Contractors to carry out routine maintenance works under the Program must incorporate, as a minimum, (i) the recommendations contained in "The Roadway Maintenance Program and Routine Maintenance Management System - Final Report" issued by the MPW&C in April 2005 and (ii) the roadway maintenance manual.
- 3.8 Prior to issuing the bidding documents for the procurement of road safety equipment for the Guyana Police Force (GPF) the Executing Agency will sign with the Ministry of Home Affairs (¶1.6) a Memorandum of Understanding (MOU) whose text will have been previously approved by the Bank setting forth the parties' responsibilities regarding the activities under the Road Safety component.
- 3.9 The feasibility and environmental studies, and the final designs of the Black Bush Polder Road works will be bundled in the same consultancy. Prior to authorizing the firm to carry out the designs for the rehabilitation or reconstruction works under the Black Bush Polder Road component, the Executing Agency will submit to the Bank's no objection the corresponding economic feasibility studies. In addition, the bidding documents for the selection of Contractors to carry out the civil works under this component must incorporate the final technical designs previously submitted to the Bank for its non-objection.
- 3.10 The contractors who will carry out the civil works for the Structure Rehabilitation - Lots A and B-, and the Rehabilitation of the Black Bush Polder Road, will be overseen by engineering supervision firms hired by the MPW&C with funds from the Financing. The construction contractors will be hired using International

Competitive Bidding (ICB) procedures and in accordance with terms of reference agreed with the Bank. Prior to issuing the bidding documents for the selection of the Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- and the Black Bush Polder Road Rehabilitation components, the Executing Agency will demonstrate, to the Bank's satisfaction, that it has selected and hired the firms to supervise such civil works.

- 3.11 The supervision firms will also carry out the supervision of the environmental and social aspects of the civil works. The supervision firms will be responsible for activities under their TOR, notwithstanding the following direct responsibility to: i) familiarize themselves with designs, ii) propose minor adjustments in the contract before the award is made, iii) establish appropriate inspection, quality assurance/quality control procedures to ensure adequate administration of the construction contracts, and ensure that environmental and social measures, based on the Environmental Management Plan (EMP), are addressed fully by the contractor, iv) approve civil works contract invoices and submit them to the GOG, v) carry out traffic counts and axle load distribution and gather data in four selected fixed locations for evaluation of the structure rehabilitation component, vi) carry out traffic counts and axle load distribution and gather data in two selected fixed locations for evaluation of the BBPR component, and vii) the supervision firm for the rehabilitation of structures shall prepare a manual and procedures to be applied during the routine inspections to the structures including the identification of areas to be inspected, methodologies to carry out the inspections, etc.
- 3.12 The supervision firms will review all technical documentation at the beginning of their contracts and at regular intervals throughout the Program to ensure, *inter alia* the adequacy of the programming of work such as geotechnical and subsurface investigation, drainage, environmental management specifications, including mitigation measures, traffic management, and worker safety recommendations. The supervision firms will verify that contractors staff qualifications (including environmental specialists) and equipment capacity satisfy design requirements to execute the works.
- 3.13 The supervision firms will submit, twice per year, reports to the Executing Agency and the Bank outlining progress in the works carried out by the contractors and will prepare as-built drawings that will also be submitted in digital format, for all work performed upon the completion of each major work component.

### **C. Procurement of goods and services**

- 3.14 In procuring goods and services financed by the Bank, the Executing Agency will follow Bank's procurement policies and procedures. The Executing Agency will use ICB for all goods and services valued at more than US\$ 100,000, for civil works valued at more than US\$ 1 million, and for consulting services in excess of US\$ 100,000. Documentation related to procurement and requests for disbursements will be reviewed ex-ante by the Bank.

- 3.15 A revolving fund of up to 5% of the financing will be set up.

**D. Execution and Disbursement period**

- 3.16 Considering the scope of works that have to be done, and the time of expiration of ongoing routine maintenance contracts, the expected disbursement period of the Program is 60 months from the date of entry into force of the Loan Contract. The following table shows the tentative disbursement schedule, in thousands of US\$.

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB (FSO)	2200	6050	7800	6300	1950	24300
GOG	260	470	620	920	430	2700
Total	2460	6520	8420	7220	2380	27000

**E. Monitoring and evaluation**

- 3.17 The monitoring and evaluation strategy will include the following: i) annual audited financial statements (¶3.18); ii) annual plan of operations (¶3.19); iii) semiannual progress reports, including traffic data and basic statistical information on the transport sector (¶3.20 to ¶3.22); iv) mid-term review (¶3.23); and v) final review (¶3.23).
- 3.18 During program execution, the Executing Agency will submit annual financial statements regarding the Program, audited by a firm of independent public accountants (private audit firm). This firm shall be selected and hired by the Borrower in accordance with Bank policies and procedures, and with terms of reference approved by the Bank. These financial statements will be submitted within the periods set forth in Article 7.03 (iii) of the General Conditions of the Loan Contract.
- 3.19 During the execution of the Program, WSG will submit to the Bank annually, at least thirty (30) days prior to the conclusion of each calendar year, an Annual Operation Plan (AOP), containing, at least the following information for the upcoming calendar year: (i) a list of the expected outputs and activities including a schedule for their implementation, (ii) the procurement plan, and (iii) budget and disbursement projections. In addition, the AOP will include an evaluation of the achievements of the preceding year.
- 3.20 Semiannual progress reports corresponding to the activities carried out during each six-month period must be prepared and submitted to the Bank by the WSG. These reports will contain, at least the following elements: i) descriptions of the executed civil works and general information about the structures, roads and safety works and road maintenance; ii) evaluations of the contractors' and the supervision firm's performances; iii) description of the procurement processes carried out during the reported period; iv) description of the executed works on a monthly basis, with detailed description of quantities and availability of labor, materials and equipment, number and qualifications of workers (skilled and unskilled) actually employed, average monthly road conditions and compliance with the routine maintenance contract and detailed unit costs and budget compliance; v) updated inventory and

evaluation of the condition of the rehabilitated structures at the end of the reported period; vi) evaluation of the maintenance plan at the end of the reported period; vii) execution plan for structures and road works to be completed in the following two six month periods; viii) maintenance plan for the following two six month periods, with the justification of the type of activities, schedule of works, identified priorities and physical (labor, equipment and materials) and financial requirements; ix) a summarized project financial statement, and x) the estimated cash flow for the next two six month periods.

- 3.21 Twice a year, during a period of 7 days (for fourteen hours per day) traffic counts and axle load distribution will be carried out in selected fixed locations on the national road network (§3.11). These counts will take into account low and high agricultural seasons. In addition, every second Thursday of each month, traffic counts and axle load distribution will be carried out during the full day, in the same selected fixed locations. The data will be collected by the supervision firms in four selected fixed locations along the Timehri – Rosignol road, and in two selected fixed locations along the Black Bush Polder Road, and will be submitted to the Bank twice a year, together with the semi-annual progress reports.
- 3.22 The Executing Agency will commence reporting statistical information on the transport sector to the Bank in the first semi-annual report of 2009. The plan to develop a comprehensive set of sector statistics includes the consolidation of data currently being collected by the transport subsectors. The Mahaica Rosignol Road Loan, LO-1094/SF-GY, included resources for institutional strengthening of the WSG to support data collection of the road subsector. The Moleson Creek-New Amsterdam Road Loan, LO 1554/SF-GY, included resources for institutional strengthening of the Central Transport Planning Unit to support assembling information collected by the remaining subsectors (air, marine, etc.).
- 3.23 When the disbursement of the Loan has achieved 40%, or the committed funds reach 50%, whatever happens first, and when the disbursement of the loan has achieved 90%, the Borrower shall submit to the bank sufficient information to allow the Bank to review: a) the impacts produced by the program execution; b) procurement procedures and results for goods, services, consultancies and civil works, and c) progress on the implementation of WSG's Manual of Standard Operating Procedures.
- 3.24 The MPW&C will collect, store and retain all necessary information, environmental and social performance reviews, indicators and parameters, including the semi-annual plans, the mid-term review, and final evaluations, in order to assist: i) the Bank to prepare the Project Completion Report (PCR); and ii) the Bank's Oversight Evaluation Office (OVE), if so wishes, to evaluate the impact of this operation, in accordance with GN-2254-5.

#### **IV. VIABILITY AND RISKS**

- 4.1 No technical, environmental, financial or socio-economic obstacles to proper implementation of this operation have been identified. To the fullest extent



possible, anticipated issues have been considered in designing the Program so as to maximize benefits and reduce unexpected costs to a reasonable minimum.

**A. Institutional viability**

- 4.2 The WSG was created in 2002 to be responsible for management of the public road investments and maintenance activities performed by the MPW&C. At present, WSG constitutes a core technical unit of the MPW&C. The WSG since its creation executed and managed IDB projects in a satisfactory manner. In 2004, using funds from the New Amsterdam-Moleson Creek Road Rehabilitation Program, WSG was the beneficiary of a strengthening process oriented to expand its functions to the planning of transport investments. Since its creation, WSG demonstrated its improved project implementation capacity that is clearly reflected in the sustained level of annual disbursements (₡1.7 to ₡1.10). The level of disbursements in the last few years has averaged US\$ 15 million, which is similar to the expected future disbursements.
- 4.3 WSG's institutional and operational capacity to manage and implement this operation according to the IDB standards was assessed by means of the Institutional Capacity Assessment System (ICAS) and the Risk Assessment (RA).

**1. Institutional capacity assessment**

- 4.4 The ICAS system bases its analysis on a set of questionnaires regarding standard operational issues that generate a computerized model of the institutional operation. The ICAS assessment recommended using the WSG as the Project Executing Unit for this Program. The level of institutional development of the WSG and the level of risk that could affect the execution of the operation are in both cases qualified as moderate according to the ICAS methodology.
- 4.5 Improvements to administrative and internal controls were recommended to improve WSG's operational efficiency, to strengthen its institutional capacity, and to ensure its reliability. These actions were incorporated into the TOR of an ongoing consultancy to prepare a Manual of Standard Operating Procedures for the WSG. The manual will focus on four goals: a) improving institutional planning and management system; b) strengthening procurement unit; c) documenting and formalizing administrative procedures; and, d) improving internal control and audit capacity (₡3.3).

**2. Risk assessment**

- 4.6 A risk assessment has been completed to identify possible problem areas related to the execution of the Program. The highest risk areas identified were the possible delays in the procurement process and the possibility that bidding prices exceed the budget. Lower risk areas identified in the assessment included MPW&C capacity to monitor contractors, and communication and coordination with the utilities that occupy the same road reserve. In addition to the aforementioned risk areas, traffic

management is a likely risk area for this Program since the main construction works would be undertaken along a highly populated region.

**B. Technical viability**

- 4.7 The technical feasibility of the Program has been established on the basis of the review of available studies, designs and specifications. The bidding documents and the construction contracts will include the environmental guidelines and mitigation measures set forth in the Environmental Studies, as well as all principal studies on engineering, soils, materials, pavements, drainage, and structures. The budget includes funds for contracting internationally reputable supervision firms to supplement local expertise in managing projects of this scope (¶2.19, and ¶3.10 to ¶3.13).
- 4.8 The execution schedule takes into account previous experiences, the nature of the works to be financed, and the amount of time required to carry out the bidding process. MPW&C has already received informal expressions of interest from international firms for some of the key components of the Program.
- 4.9 *Structure rehabilitation.* In early 2005, Guyana experienced extreme floods that resulted in the declaration of a national disaster by the GOG. Although the combination of extended heavy rainfall, malfunctioning drainage systems and high tides contributed to the accumulation of 3 to 5 feet of water in some areas, no structural damage, displacement or erosion was observed on and around the structures rehabilitated by the previous operations. For the present operation, designs have been improved and associated cost estimates have been evaluated before selecting the proposed construction methodology. The use of standard precast structures has been found to be feasible both in terms of construction cost and impact on traffic during construction stages (¶1.30, ¶4.14, 4.15, and ¶4.17). Additionally, the activities financed by this operation will include the preparation of manuals and procedures for inspection of structures and monitoring (¶3.11).
- 4.10 *Continued implementation of the RMMS.* The RMMS program has been in place since December 2003. An assessment of the Roadway Maintenance Program and the RMMS conducted in 2005 identified areas of improvement of the system, and proposed instruments to address them (¶1.18). The implementation of these recommendations is incorporated into the special conditions for this component, as well as the update of the road survey condition and unit costs database.
- 4.11 *Road safety.* The road safety report of 2003 (¶1.19) assessed the worst road corridors and recommended measures, some of which have been implemented in ongoing operations (¶1.20 and ¶1.21). This loan will finance additional road safety activities in the main road segments.
- 4.12 *Black Bush Polder Road.* The MPW&C requested the Bank to finance additional activities to the ones being executed by GOG, including scarification of the existing DBST, the correction of geometry leveling and an overlay of 50 mm of asphalt concrete (¶2.17). A final economic evaluation of the proposed works, the

preparation of designs and environmental analyses (including an Environmental Management Plan) will be conducted and submitted to the Bank for no-objection prior to the execution of the works (¶3.9).

### **C. Economic viability**

- 4.13 *Background.* During the preparation of the Bridges Rehabilitation Program (¶1.9), the economic feasibility study of Lot 1 structures along the Timehri – Rosignol roadway took into account benefits derived from reduced vehicle operating costs (VOC) and time-savings of vehicle operators and passengers. The study, carried out in 1997, considered costs and benefits of each structure as well as the overall program. The results indicated that the overall net present value (NPV) of Lot 1 was US\$ 93.5 million. Consequently, the economic feasibility study for Lot 1 was positive and robust. The structures to be rehabilitated under the present Program required an updated economic feasibility analysis, as some of the assumptions that were considered in the study of 1997 likely would have changed.
- 4.14 *Methodology.* The economic analysis of Lot A structure rehabilitation considered two different approaches in calculating the possible benefits of the Project. An estimate has been made of the time savings, or benefits, that would be required for each structure in order to achieve a 12% economic internal rate of return (IRR) over each corridor, followed by an estimate of the amount users are willing to pay, or cost, for a 12% IRR. This method is equivalent to computing the long run marginal costs (LRMC) of the bridges, which is most appropriately calculated by computing the average incremental cost (AIC). The economic feasibility study demonstrated a high probability that the Project is economically feasible.
- 4.15 An estimate was made of the time savings required to achieve an IRR of 12% due to the improvements of each individual structure. The estimates did not include savings from user vehicle operating costs or unforeseen interruptions in traffic due to unexpected structural failures, and therefore the results underestimate the benefits to some extent. The time savings required for a 12% IRR along each corridor ranged from less than 2 minutes for the Mahaica-Georgetown (MG) and Rosignol-Mahaica (RM) segments to slightly over four minutes for the Timehri-Georgetown (TG) road. These time savings are reasonable and consistent with what may be expected to occur.
- 4.16 The second approach consisted of calculating the AIC of each structure and to examine what is a reasonable amount users would be willing to pay for permanent, uninterrupted and efficient transportation along the improved roadway. If the AIC lies below what the users would be willing to pay, that is, if this value is less than the perceived benefits to the user allowing for an IRR of 12%, then the Project is economically feasible.
- 4.17 *Results.* The total cost over time per vehicle (AIC) of having an improved and reliable system of culverts and bridges is \$0.08 for MG, \$0.05 for MR, and \$0.20 for TG (cost per structure is 0.3 cents, 2.4 cents and 0.6 cents respectively). Each

user is already incurring transport costs of \$8 for MG, \$9 for MR, and \$13 for TG. The additional costs are considered reasonable since they represent between 0.4% and 2.2% of the current transport costs.

- 4.18 Sensitivity analyses were performed for time savings and AIC. The tables below show various scenarios, including worst cases for time savings to achieve 12%IRR and for AIC. The analyses verified the robustness of the Project.

Corridor	Time Required to be Saved for 12% IRR (in minutes)				
Scenario	Base Case	Investment Costs Increased 20%	Growth Rates Reduced to 0%/yr.	User Time Decreased 25%	Cost, Rates and Time Changed Simultaneously
MG	1.72	2.06	2.14	2.29	3.42
TG	4.18	5.01	5.20	5.57	8.32
RM	1.43	1.72	1.78	1.91	2.85

Corridor	Average Incremental Cost (AIC) (in cents)			
Scenario	Base Case	Investment Costs Increased 20%	Growth Rates Reduced to 0%/yr.	Cost & Rates Changed Simultaneously
MG	7.99	9.58	9.94	11.93
TG	19.57	23.49	24.37	29.25
RM	4.80	5.76	5.98	7.17

- 4.19 *Least Cost Alternative Considerations.* In order to reduce the delays and extensive traffic congestion, rehabilitation designs use precast structures rather than *in situ* casting that was done in the Lot 1 program was proposed. Comparable costs of the approaches indicated that costs of the precast approach are more expensive than the *in situ*. Nevertheless, when taking into consideration the user savings from reduced delays inherent in precasting, precasting proves to be the least cost alternative.
- 4.20 *Black Bush Polder Road.* An economic evaluation of the Black Bush Polder Road was carried out, based on the preliminary designs (¶1.12). Considering that these preliminary designs have been revised by GOG, and since some rehabilitation works are currently ongoing (¶1.13), both the traffic studies and the economic feasibility of the proposed activities to be financed by this Program have to be revised. The no-objection from the Bank to the final economic evaluation is incorporated into the special conditions for this component (¶2.18 and ¶3.9).

#### D. Financial viability

- 4.21 GOG's financial strategy for managing its road infrastructure relies on two financial sources: i) External resources to finance capital investments, these include both infrastructure rehabilitation and improvement within the main network (LO999/SF-GY, LO1094/SF-GY, and LO 1554/SF-GY), and ii) Internal Recurrent resources to finance maintenance and improvement activities. The CDB is completing the financing of the upgrading of two semi-urban roads to four lanes. The EU has contributed to sector studies but no investment program has been structured upon financing from this institution. Hence the Bank is foreseen to be

the only and most significant source of financing for road infrastructure in the medium term (¶1.39). The abovementioned ongoing operations and the present Program will provide the projected resources for investments in the road network.

- 4.22 The resulting financial consequences of this strategy are: i) debt-servicing costs related to the loans, and ii) a portion of recurrent costs required to sustain the investments into the long term.
- 4.23 *Debt-servicing.* Under the last IMF-supported PRGF Program (expired in September 2006; discussions on a new facility are expected to begin in early December 2006), a threshold of 250% has been established for the ratio of disbursed external debt to revenue. The ratio of disbursed debt to revenues is expected to peak just below the 205% ratio in 2011, declining thereafter. Although the country remains at moderate risk of debt distress, the threshold already incorporates this Program and therefore the approval of this loan will not affect debt sustainability beyond the agreed benchmark (¶1.2 and ¶1.3).
- 4.24 *Recurrent costs.* Funding for the local counterpart of this Program will come directly from the central government budget. The availability of counterpart funding has not presented an obstacle to project execution in Guyana in recent years. Projected disbursements of the counterpart for this loan have been incorporated into the PSIP of Guyana. The PSIP forecasts an annual commitment of US\$5 million for the next 5 years for the national road program.
- 4.25 The rehabilitation and maintenance of the main road network by these funds have resulted in improved road conditions, and shifted the network's needs from periodic to routine maintenance. Hence, the main road network financial requirements for the routine maintenance can be covered with no additional burden on GOG's future budget allocations.

#### **E. Environmental and social viability**

- 4.26 This program includes two main civil work components: rehabilitation of structures, grouped in Lot A and Lot B, and the rehabilitation of the Black Bush Polder Road. Designs for the structures and an Environmental Management Plan (EMP), have been completed as part of the preparation for Lot A; Lot B will have an EMP prepared during the design of structures stage; finally, Black Bush Polder Road will also have a complete EMP prepared during the design stage of the road. The EMPs will be submitted to the Bank for their no objection prior to the bidding process. The Structure Rehabilitation - Lot A is considered socially and environmentally viable. The EMP provides the measures to comply with adequate standards for traffic control and management, water and waste management, and the minimization of environmental and social impacts associated with the construction activities, and the improvement of the construction methodology for structures. Prior to initiation of the first civil work under each component of the Program, the Executing Agency will demonstrate, to the Bank's satisfaction that

the appropriate authority has issued the environmental licenses for all the civil works to be carried out under the particular component (¶3.5).

- 4.27 The potential positive socio-environmental impacts of the Program are: i) improved access to markets and social services by reduced travel time and transport costs, ii) reduction of the potential negative impact of local and sub-regional flooding to residential, agricultural and business properties by improving road traffic and safety conditions and enhanced storm water management, and iii) increased safety for pedestrians, road users, and a reduction in the number, occurrence, and severity of accidents.
- 4.28 The negative environmental and social impacts of the Program are likely to be restricted to the immediate area of the road and limited to the construction period. Given the characteristics of the proposed civil works, as well as the fact that they will take place within the existing right-of-way and will not affect the resident population, the potential negative impacts are: i) traffic congestion, creation of hazardous driving conditions and temporary obstruction of access to community services and residential and commercial areas; ii) soil erosion with possible sedimentation of nearby water bodies, resulting from earth movement from excavation and construction waste; iii) soil and water contamination due to waste and effluents coming from work areas or equipment yards; iv) generation of dust, noise and gases by the operation of construction activity, equipment and vehicles; v) risk of accidents for workers or road users around construction sites; and vi) accidental rupture of utility pipes and lines (electricity, telephone, and water), including 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 (¶4.32, ¶4.35 and ¶4.36).
- 4.29 The Guyana Environmental Protection Agency (EPA) is responsible for promoting the effective management of the natural environment. The EPA is also responsible for issuing an environmental permit for any project that may significantly affect the environment, based on the approval of an Environmental Impact Assessment (EIA). An EIA for the Bridges Rehabilitation Program assessed the Project's area of influence and the potential environmental impacts, including an EMP for the corresponding structures. In 1999, the EPA issued the MPW&C an Environmental Permit for the Bridges Rehabilitation Program, and a construction permit to implement Lot 1 structures.
- 4.30 During the implementation of Lot 1 the Contractor did not always treat traffic management with the promptness that was deemed necessary. Therefore, by applying lessons learned to the design of the present Program, WSG promoted the following adjustments: i) replacement of all in situ culverts with pre-cast culverts, which require shorter construction periods and improves sequencing of work; and ii) amendment of the tender documentation to address Contractors' responsibilities in issues of traffic diversions, traffic management and utility relocation. All civil works, including cofferdams and temporary diversion roads will be developed

within the right of way of the existing roads, not requiring expropriations. All culverts will be built in one step and according to each site one of the following methods will be implemented: (i) diversion of existing drainage to another nearby canal; or (ii) diversion of drainage through temporary pipe-culverts or temporary bridges spanning over canals. In every case the contractor prior to commencement of the works must present for approval utility relocation, specific drainage and traffic management plans.

- 4.31 During project preparation, an EMP for Lot A was developed based on the results of the EIA developed in the first phase and a site visit; results of public consultations; meetings with environmental and national transport agencies and review of available Project studies and designs. The EMP provided general and specific conditions to be incorporated during the pre-construction, construction, and post-construction periods. The EMP provides general procedures for supervisory oversight, coordination, liaison, monitoring and reporting, with specific emphasis during pre-construction and construction activities until civil works are completed and roads open to the public. As a condition prior to approval of tender documents, the MPW&C will ensure that the EMP is included in the bidding documents, and provisions are included for contractors to adopt and implement the Plan. The Plan consists of the following components:
- 4.32 **Impact mitigation.** The bidding documents for the selection of Contractors to carry out the civil works under the Structure Rehabilitation -Lots A and B- must incorporate the Environmental Management Plan (EMP), previously submitted to the Bank for its non-objection, containing the General and Particular Environmental Specifications and the provisions on the mitigation, management, supervision and monitoring of environmental impacts and on the training by the supervision firm of staff (from the Executing Agency, the Supervision firms and the Contractors) on environmental and social management. To avoid, prevent and mitigate anticipated negative environmental and social impacts from the Program, the following specific measures and activities must be implemented: a) Activities to be followed during pre-construction, construction, and post-construction periods (e.g., fuel management, erosion control, water management, dust control, construction yard and pre-casting facility, traffic management, workers training, health and safety, etc.); b) Waste management procedures for solid waste, hazardous waste and demolition debris; c) Emergency response procedures, including spills management and a contingency plan; d) Procedures to be followed during operation (e.g., maintenance, vegetation clearing, road safety, drainage systems monitoring system, etc.). In addition to a description of the actions to be taken, the EMP also provides, based on the phase of the project: 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. In addition, the Contractors will be required to hire Environmental Specialists as part of their field personnel.

- 4.33 ***Supervision and Monitoring.*** Supervision, inspection and enforcement of the EMP will involve the participation of the WSG's environmental engineer, the supervision firm, the contractor and the EPA. The MPW&C will contract, with the resources of the Financing, international supervision firms that will provide internationally-experienced environmental inspectors, who will be assisted by locally-contracted environmental inspectors. The environmental inspectors will oversee contractors' compliance with environmental mitigation and management specifications, and provide training to MPW&C, WSG and Contractors' staff. EPA will receive semi-annual reports and any other reports prepared in relation to environmental management, including emergencies that may occur (e.g. spills of hazardous substances). A Social and Environmental Monitoring Program will be initiated during the construction phase and will be continued throughout the operation phase. Monitoring will be carried out to ensure the environmental viability of construction activities, compliance with the EMP, including the need for a traffic management plan applicable to each location, and proper follow-up during maintenance. Monitoring of soil quality, vegetation health, traffic control and management, and level of interference with residential and business activities will be carried out.
- 4.34 ***Training.*** The Supervisory Engineer will provide training to the following groups: i) WSG's Environmental Engineer and MPW&C senior staff: training on basic environmental management and procedures for managing EMPs; ii) Construction Contractors' personnel will be trained on: environmental management, environmental emergency response, materials handling, waste material management and application of environmental mitigation and management specifications; iii) MPW&C and WSG staff, Construction Contractors' Environmental Specialists will be trained on: 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 will be trained on: implementation of the EMP, and basics of emergency response, spills control, hazardous materials handling and management, and traffic management. The above training will be included in the supervision firms' budgets.
- 4.35 ***Lot B Structures.*** During the studies and design stage of Lot B structures (¶3.5 and ¶4.32), an EMP will be prepared based on the activities developed for Lot A, and its recommendations will be included in the corresponding bidding documents for the selection of contractors to carry out the civil works. In addition, the no-objection from the Bank on the EMP will be a condition prior to the commencement of the bidding process. The bidding documents for the selection of supervisory firms of the civil works of Lot B component must incorporate, as a minimum, a requirement that the selected firm hires an Environmental Inspector as part of their field personnel. The bidding documents for the selection of Contractors to carry out the civil works must incorporate the requirement that the selected contractor hires an Environmental Specialist as part of their field personnel.



- 4.36 *Black Bush Polder Road Rehabilitation*. During the preparation of the New Amsterdam-Moleson Creek loan an Environmental and Social Impact (ESI), dated July 2004, was produced addressing several road segments, including the BBP, on which works were to be carried out following a prioritization exercise. During the studies and design stage of BBPR (¶3.9), an EMP will be prepared. The bidding documents for the selection of the supervision firm for this component must incorporate, as a minimum, a requirement that the selected firm hires an Environmental Inspector as part of their field personnel. The bidding documents for the selection of Contractors to carry out the civil works under this component must incorporate: i) the EMP, previously submitted to the Bank for its non-objection, containing the General and Particular Environmental Specifications and the provisions on the mitigation, management, supervision and monitoring of environmental impacts and on the training of staff (from the Executing Agency, the Supervision firms and the Contractors) on environmental and social management, and ii) the requirement that the selected contractor hires an Environmental Specialist as part of their field personnel.

#### **F. Benefit and beneficiaries**

- 4.37 The Program will have a positive impact upon the urban, semi-urban and rural population of Guyana. As a result of the Program, the physical, operational and safety conditions of the road segments will be improved, including ongoing maintenance procedures, resulting in the following positive contributions to socio-environmental quality: i) *traveling public*: travel time and economic costs will be reduced as a result of delays reductions; safety in private and public vehicles and truck transport will be increased; per-kilometer cost of vehicle operation and emissions in local air pollution will be reduced as traffic will move more smoothly with the decrease of stop and go traffic and congestion; ii) *pedestrians*: safety in built-up areas and in proximity to schools, hospitals and markets will be increased as a consequence of widening the bridges and their approaches, and paving the shoulders; iii) *traveling public and residents*: the number and severity of vehicle-to-vehicle and vehicle-to pedestrian accidents will be reduced; stress and noise levels will decrease; and iv) *agricultural producers and residents*: movement of products to markets and transport services to hospital and schools will be more efficient; storm water management will be improved due to improvements of drainage systems, reducing impacts of local and sub-regional flooding and erosion and sedimentation processes.

#### **G. Risks**

- 4.38 The process of preparing the Risk Assessment (RA) (¶4.3) involved review of material, drafting of a questionnaire, interviewing stakeholders, and identification and analysis of key problems (¶4.6). In conjunction with the PPMRs, the Annual Operative Plan and the Risk Assessment, a Supervision Plan for continuous follow up of risks throughout the execution of the Program will be developed and include the following mitigation strategy for the identified risks. (¶4.39 to ¶4.43)

- 4.39 The risk of procurement delays was associated with the institutional weaknesses of the former CTB. With the Bank's assistance and additional support from the Canadian International Development Agency (CIDA), the World Bank and the Caribbean Regional Technical Assistance Center (IMF/CARTAC) the procurement processes were updated and relevant regulations and procedures are being developed; new Fiscal Management, Procurement and Audit Acts were approved; a new National Procurement and Tender Administration Board (NPTAB) has been created, although the members of its corresponding constitutional oversight body have not yet been appointed. These measures contribute to mitigate this risk.
- 4.40 Due to the possibility of delays, claims, and cost overruns, performance based lump-sum procedures accepted by the MPW&C and implemented in previous and ongoing Programs will be adopted in this operation for the rehabilitation of structures, routine maintenance contracts, and the rehabilitation of the BBPR. However, based on the lessons learned from the New Amsterdam-Moleson Creek Road Rehabilitation Programs, the lump -sum methodology will be adjusted to allow for unit price variations by the introduction of an adjustment formula methodology (§1.9, §1.10 and §1.23 to §1.26).
- 4.41 Another risk to the successful execution of the Program derives from the weakness of the MPW&C capacity to monitor contractors. WSG will continue to act as the project executing unit, within the MPW&C. The WSG's shortcomings identified in the institutional assessment and the RA report are not substantial and may be addressed in a short period of time following the recommendations contained in the RA's action plan and in the preparation of a Manual of Standard Operating Procedures (§3.3). The adoption of the Manual of Standard Operating Procedures will be a condition precedent to first disbursement of the Financing. Although WSG's capacity to monitor and coordinate contractors has not posed a difficulty in the execution of previous operations, it will be continuously assessed by the Bank by means of the Supervision Plan (§4.38).
- 4.42 Communication and coordination with the utility companies and traffic control, diversion and management have been areas of concern identified since the early implementation of the Bridges Rehabilitation Program. Significant progress was made during the execution of that Program in terms of coordinating activities and schedule of works, setting up procedures for communications and meetings before execution of works and at the time of utility reconnection. The bidding documents and the Environmental Management Plan were revised to make unambiguous specifications regarding the procedures to be adopted for coordination with utility companies and traffic control, and the level of performance required.
- 4.43 In addition to managing traffic disruptions through definitions in the bidding documents, the structures rehabilitation of Lots A and B include pre-cast construction methodology to reduce construction periods and to improve the sequencing of works reducing traffic disruptions to a minimum. Traffic control, diversion and management measures will be implemented in the construction sites, as stated in the EMP.

**GUYANA: Transport Infrastructure Rehabilitation Program  
(GY-L1008)**

	<b>OBJECTIVES</b>	<b>INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>ASSUMPTIONS</b>
<b>GOAL</b>	<ul style="list-style-type: none"> <li>Contribute to promote permanent accessibility and safety along the main road network.</li> </ul>			
<b>PURPOSE</b>	<ul style="list-style-type: none"> <li>Improve the road network and driving conditions.</li> <li>Improve Road Safety conditions.</li> </ul>	<ul style="list-style-type: none"> <li>At least, during the two years following completion of works, no closures on the Timehri – Rosignol road due to failures in the rehabilitated structures.</li> <li>More than 70% of the main road network is under routine maintenance program throughout the execution of the program, and during the two years following completion of works.</li> <li>Fatality reduction of 10% along the selected corridors, at least during two years after implementation of safety measures.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Works progress reports produced by supervision firms and MPW&amp;C.</li> <li>MPW&amp;C records of performed maintenance.</li> <li>MPW&amp;C highway safety records.</li> </ul>	<ul style="list-style-type: none"> <li>Macroeconomic framework remains stable.</li> <li>Pro investment business climate.</li> <li>Continuing investment in road maintenance and highway safety.</li> <li>Adequate enforcement of traffic laws by Police Force.</li> </ul>

<sup>1</sup> A baseline exists in the MPW&C, based on data collected for the Road Safety Study completed in 2003.

**GUYANA: Transport Infrastructure Rehabilitation Program  
(GY-L1008)**

	<b>OBJECTIVES</b>	<b>INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>ASSUMPTIONS</b>
<b>OUTPUTS</b>	<ul style="list-style-type: none"> <li>Improvement of the road network and driving conditions along the Timehri – Rosignol roadway by replacing and rehabilitating existing critical structures.</li> <li>Strengthen the ongoing road maintenance activities along the main road network.</li> <li>Road Safety measures implemented along the main road network.</li> <li>Rehabilitation of the Black Bush Polder Road on time and budget.</li> </ul>	<ul style="list-style-type: none"> <li>Construction of structures completed by:</li> <li>Lot A: first half of 2009.</li> <li>Lot B: first half of 2010.</li> <li>Existing contracts renewed on time, allowing for uninterrupted maintenance on road segments under the RMMS, throughout the execution period of the Program.</li> <li>Road Safety measures implemented by first half of 2010.</li> <li>Black Bush Polder Road rehabilitation completed by first half of 2009, with no more than 10% variation from contract cost.</li> </ul>	<ul style="list-style-type: none"> <li>Bank supervision.</li> <li>Supervisory consultant report.</li> <li>WSG and MPW&amp;C semestral reports.</li> <li>Auditors report.</li> <li>MPW&amp;C highway safety records.</li> </ul>	<ul style="list-style-type: none"> <li>Adequate counterpart funds provided.</li> <li>Adequate budgetary allocations and provisions in accordance with mandate of WSG.</li> <li>Continuing with adequate budget provision for road maintenance in accordance with RMMS specifications.</li> <li>Adequate enforcement of traffic laws by Police Force.</li> <li>No extraordinary climate emergencies.</li> </ul>
<b>ACTIVITIES</b>	<ul style="list-style-type: none"> <li>Rehabilitation of structures.</li> <li>Supervisory activities.</li> <li>Engineering, environmental and economic studies for i) Lot B of structures, and</li> </ul>	SEE BUDGET TABLE	<ul style="list-style-type: none"> <li>Bank supervision.</li> <li>Supervisory consultant report.</li> <li>WSG and MPW&amp;C semestral reports.</li> <li>Auditors report.</li> <li>MPW&amp;C highway safety</li> </ul>	<ul style="list-style-type: none"> <li>Competitive bidding attracts qualified contractors, supervisors and consulting firms.</li> <li>Preparatory studies are contracted rapidly.</li> <li>Counterpart funds</li> </ul>

**GUYANA: Transport Infrastructure Rehabilitation Program  
(GY-L1008)**

	<b>OBJECTIVES</b>	<b>INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>ASSUMPTIONS</b>
	ii) BBPR rehabilitation. <ul style="list-style-type: none"> <li>• Contract out routine road maintenance activities.</li> <li>• Implementation of the road safety measures.</li> <li>• Rehabilitate the Black Bush Polder Road.</li> </ul>		records.	provided in a timely manner. <ul style="list-style-type: none"> <li>• Adequate budgetary provisions for funds.</li> </ul>

**GUYANA: Transport Infrastructure Rehabilitation Program  
(GY-L1008)**

**PROCUREMENT PLAN**

**GENERAL**

**1.0 Project Information**

Borrower: Cooperative Republic of Guyana  
Project: Transport Infrastructure rehabilitation Program  
Loan No.: GY-L 1008  
Executing Agency: Ministry of Public Works and Communication (MPW&C)

**2.0 Approval Date of Procurement Plan by Bank**

Original Plan: November 15, 2006

**3.0 Date of General Procurement Notice**

The General Procurement Notice will be published in November 2006.

**4.0 Period Covered by this Procurement Plan**

This Procurement Plan covers the period January 2007 to June 2008.

**GOODS, WORKS AND NON-CONSULTING SERVICES**

**1.0 Prior Review Threshold**

	<b>Procurement Method</b>	<b>Prior Review Threshold (USD)</b>	<b>Comments</b>
1	ICB and LIB (Goods)	100,000	-
2	NCB (Goods)	25,000	-
3	ICB (Works)	1,000,000	-
4	NCB (Works)	100,000	-

**2.0 Prequalification**

Bidders for ICB works shall be prequalified in accordance with the provisions of paragraphs 2.9 and 2.10 of the Policies.

**3.0 Proposed procedures for community-driven development components**

## GUYANA: Transport Infrastructure Rehabilitation Program (GY-L1008)

There are no such components in this project.

### 4.0 Procurement Packages with Methods and Time Schedules

Ref No.	Contract Description	Estimated Cost (USD)	Procurement Method	Prequal. (Y/N)	Domestic Preference (Y/N)	Review by Bank (Prior/Post)	Expected Bid Opening Date	Comments
1	RMMS East Bank Demerara	315,000	NCB	N	N	Prior	January 2007	-
2	Bridges Rehabilitation – Lot A	9,000,000	ICB	Y	N	Prior	May 2007	-
3	Traffic Safety Equipment for Police	190,000	ICB	N	N	Prior	April 2007	
4	RMMS West Bank Demerara	95,000	NCB	N	N	Prior	May 2007	-
5	RMMS West Coast Demerara	280,000	NCB	N	N	Prior	May 2007	-
6	RMMS East Coast Demerara	315,000	NCB	N	N	Prior	June 2007	-
7	RMMS Linden-Soesdyke Highway	615,000	NCB	N	N	Prior	September 2007	
8	RMMS Essequibo Coast	530,000	NCB	N	N	Prior	October 2007	-
9	Street Light – East Coast Demerara	180,000	NCB	N	N	Prior	December, 2007	-
10	Street Light – West Coast Demerara	675,000	NCB	N	N	Prior	December, 2007	-
11	Street Light – West Bank Demerara	135,000	NCB	N	N	Prior	December, 2007	-
12	Black Bush Polder Road	3,000,000	ICB	N	N	Prior	March 2008	-

## SELECTION OF CONSULTANTS

### 1.0 Prior Review Threshold

	Procurement Method	Prior Review Threshold (USD)	Comments
1	ICB (Firms)	100,000	-
2	NCB (Firms)	25,000	-
3	Single Source (Firms)	0	All processes to have prior review
4	IPB (Individuals)	20,000	-
5	Single Source (Individuals)	0	All processes to have prior review

### 2.0 Shortlist Comprising Entirely of National Consulting Firms

## **GUYANA: Transport Infrastructure Rehabilitation Program (GY-L1008)**

Shortlist of consulting firms for services estimated to cost less than US\$100,000 or equivalent per contract may comprise entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultants Policies.

### **3.0 Any other special selection arrangements**

None

### **4.0 Consultancy Assignments with Selection Methods and Time Schedules**

<b>Ref No.</b>	<b>Description of Assignment</b>	<b>Estimated Cost (USD)</b>	<b>Selection Method</b>	<b>Review by Bank (Prior/Post)</b>	<b>Expected Proposal Submission Date</b>	<b>Comments</b>
1	Independent Public Accountant	350,000	LIB	Prior	January 2007	-
2	Supervision Firm for Bridges Rehabilitation –LotA	1,000,000	ICB	Prior	March 2007	-
3	Black Bush Polder Economic Studies and Designs	200,000	ICB	Prior	April 2007	-
4	Designs and Studies for Bridges Rehabilitation –LotB	400,000	ICB	Prior	March 2007	-
5	Supervision Firm for Bridges Rehabilitation –LotB	500,000	ICB	Prior	March 2008	-
6	Supervision Firm for Black Bush Polder Rehabilitation	300,000	ICB	Prior	March 2008	-

### **IMPLEMENTING AGENCY CAPACITY BUILDING ACTIVITIES WITH TIME SCHEDULE**

No capacity building activities have been programmed under this project.



DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/06

Guyana. Loan \_\_\_/SF-GY to the Co-operative Republic of Guyana  
Transport Infrastructure Rehabilitation Program

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Co-operative Republic of Guyana, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a transport infrastructure rehabilitation program. Such financing will be for an amount of up to US\$24,300,000, or its equivalent in other currencies, except that of Guyana, which are part of the resources of the Bank's Fund for Special Operations, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

LEGIII/GY-730692-06  
GY-L1008