

GUATEMALA CITY METROPOLITAN AREA ENVIRONMENTAL PROGRAM

(GU-0073)

EXECUTIVE SUMMARY

BORROWER: Municipality of Guatemala City

GUARANTOR: Republic of Guatemala

EXECUTING AGENCY: Municipality of Guatemala City, in coordination with the other municipalities that comprise the Guatemala City Metropolitan Area (GCMA), through a central coordinating unit (CCU).

AMOUNT AND SOURCE:

IDB:	US\$34,800,000 (IFF)
Local counterpart funding:	<u>US\$ 8,800,000</u>
Total:	US\$43,600,000

FINANCIAL TERMS AND CONDITIONS:

Amortization period:	25 years
Disbursement period:	5 years
Grace period:	5 years
Interest rate:	variable with IFF subsidy
Inspection and supervision:	1%
Credit fee:	0.75% on undisbursed balances

OBJECTIVES:

The general objective of the program is a sustainable improvement in the quality of life in the GCMA. The specific objectives to achieve this are: (i) to improve metropolitan management of environmental services by encouraging private sector and community involvement, and (ii) to improve the quality and coverage of environmental services, thus reducing the environmental degradation caused by improper solid and liquid waste collection and disposal, and to enlarge metropolitan-area green spaces through investments to introduce new management systems (see Logical Framework in Annex II-1).

To accomplish the program's overall goal, its objectives will be reinforced by ATN/SF/CI-5112-GU, specifically for environmental land-use planning and management, air-pollution monitoring and control, environmental education, and modernization of the institutional mechanisms for environmental services management.

DESCRIPTION: The activities to be carried out to accomplish the program's objectives will, taken together, achieve

its overall goal. To that end, financing will be provided for the following four components:

1. Reform and institutional development of metropolitan environmental management (US\$3.2 million): by providing technical assistance, training, equipment and specialized implements, the following three areas are targeted to effect the necessary reform and institutional development and create the efficient cost-recovery mechanisms that environmental public services must have in order to operate on a metropolitan scale: (i) modernization of municipal management; (ii) modernization of environmental public services; and (iii) strengthening of the capacity to monitor and control the environment.
2. Solid waste management (US\$17.8 million): under this component: (i) equipment will be purchased and new solid waste collection systems will be introduced that involve the private sector and microentrepreneurial and community collection systems and cover the entire GCMA; and (ii) systems will be introduced to sort, process and dispose of solid waste collected from throughout the entire GCMA (nine municipalities), which will include the establishment of two sorting and composting plants and sanitary landfills at El Trébol (Zone 3) and Km 22 (Villanueva).
3. Sewage management (US\$5.9 million): under this component, priority measures will be carried out to reinforce the EMPAGUA/JICA master plan for conveying and treating sewage. Those measures include the following: (i) modernization of seven existing priority treatment plants; (ii) introduction of sewage collection and treatment alternatives (septic tanks) in five priority shanty areas; and (iii) construction of two new sewage treatment plants that discharge into springs and the Lake Amatitlán basin.
4. Management of green spaces (US\$3.1 million): investments in reforestation, forest rehabilitation and management of priority GCMA green spaces will be financed, including: (i) reforestation and stabilization of priority areas in six ravines (576 hectares); (ii) beautification of 17 city parks and two municipal nurseries; and (iii) monitoring of forests in the Cerro Alux protected area, one of the GCMA's principal water supply sources.

**POVERTY
TARGETING:**

The program directly or indirectly benefits the entire population of the Guatemala City Metropolitan Area, which in 1995 was an estimated two million people. Of these, 53% were below the Bank-calculated poverty line. Its direct impact, however, is focused mainly toward low-income groups. The solid waste management component will be of greatest benefit to people from marginal and low socioeconomic strata, an estimated 450,000 people who do not presently have solid waste management service. With the septic tanks to be installed under the program, the sewage management component would directly benefit some 500,000 people living in shanty areas. The priority and direct beneficiaries of the green spaces component would be some 500,000 people living in slums built in ravines.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environment Committee, at its meeting of January 24, 1995, classified this as a Category III operation. The environmental summary was approved at the CMA meeting of August 27, 1996, and the respective environmental impact mitigation plan (Annex II-8) will be included in the budget and loan contract.

**APPROVAL
PROCEDURE:**

In accordance with the standards approved by the Board of Executive Directors (document DR-398-2), this operation will be submitted to the Committee of the Whole since (i) the amount involved exceeds the established ceiling, and (ii) it includes innovative dimensions.

BENEFITS:

The following are among the benefits of the program's four components: (i) environmental public services will be more efficient thanks to the private sector's involvement, the introduction of cost-recovery systems and the institutional reforms needed to modernize metropolitan environmental management; (ii) sanitary conditions at the Zone 3 dump will improve and the environmental problems caused by the more than 500 clandestine dump sites will be alleviated; (iii) with collection and treatment of sewage effluent, the water discharged into the watershed south of the city, which is the source that feeds Lake Amatitlán and the drinking water springs, will be cleaner; and (iv) the risk of landslides will be lessened and the soil in ravines, urban green spaces and the Cerro Alux reserve will be better protected, thereby safeguarding waterways, reducing sedimentation, and increasing green spaces and recreational areas.

RISKS:

The following are some of the potential obstacles that could threaten the success of this operation: (i) the revenues generated are insufficient to cover the works financed under the loan; (ii) opposition from homeowners in the impact areas of the future landfills; (iii) opposition from the truck drivers who now pick up the refuse, if they believe they are being left out of the proposed new collection system; (iv) loss of newly planted trees in green spaces due to vandalism and theft; and (v) EMPAGUA's inability to live up to its commitment to operate and maintain the sewage treatment infrastructure transferred under the program. To keep the potential for these obstacles at a minimum, the following precautions have been taken: (i) realistic and innovative cost-recovery and loan repayment mechanisms are being instituted; should that fail, the Municipality still has the financial means to repay the debt, and the loan is guaranteed by the central government; (ii) community surveys have been conducted and their recommendations included in the terms of reference for the final designs; also, information about the project will be circulated before it gets under way; (iii) the refuse truckers' unions have been included in the training activities and may be involved in the refuse-collection service contracting; (iv) the labor to restore green spaces will be hired from adjacent neighborhoods; also, the public will be sensitized to the importance of protecting seedlings in reforested areas; and (v) EMPAGUA will be required to take corrective measures, including possible rate adjustments, which would come under the reform and institutional development component.

**THE BANK'S
COUNTRY AND
SECTOR STRATEGY:**

One of the goals of the strategy that the Bank and the Guatemalan Government agreed upon for the 1996 to 1998 period, which appears in the country paper of March 29, 1996 (GN-1924), is more and better social services through programs to improve the coverage, quality and efficiency of the basic social services. One of the linchpins of this strategy is proper management and conservation of natural and environmental resources.

Specifically, in the case of the water and sanitation sector, the Bank's strategy is to focus on the sector's institutional reorganization and to decentralize responsibility for establishing and operating the water and sanitation systems, shifting it instead to the local level.

This operation is consistent with the strategy of the Bank's Eighth Replenishment, as the solutions to the

main environmental problems will be biased in favor of low-income groups living in the GCMA's poorest areas. Another goal of this program is institutional development and reform of the metropolitan area's environmental management. This, too, fits into the strategy to make public services more efficient by bringing in the private sector and recovering costs. The Municipality will undertake to repay the debt, which also fits into the Bank's strategy since the central government will not have to shoulder any additional financial burden.

**CEILINGS FOR
PROCUREMENT:**

In the case of goods and services, any purchases in excess of US\$250,000 will be by international competitive bidding; in the case of works, international competitive bidding will be required for anything in excess of US\$1.5 million (3.17).

**SPECIAL
CONTRACTUAL
CONDITIONS:**

1. Precedent to the first disbursement:

- a. Creation of the program's executive council and the latter's approval of the organizational structure proposed for the program (3.1).
- b. The preliminary plan for outsourcing solid waste management to the private sector (3.13).
- c. To ensure that the environmental impact mitigation and control plan is implemented, its timetable and final financing program, including the measures agreed upon with the Bank for contingency expenditures (5.2 and Annex II-8).

2. Special conditions

- a. Within 12 months, necessary consulting services are to be contracted to improve and manage the municipal cadastre and the administrative, accounting and treasury systems and to collect the single real estate tax (4.14).
- b. The following are to be submitted before bids are issued for:
 - (i) the trucks and works under the solid waste management and green spaces components: (1) a final plan for outsourcing solid waste management to the private sector (3.13); (2) an

- agreement concluded with the electric power company whereby the latter will bill for refuse collection on the electric power bill, and an agreement concluded with the firm that administers the proceeds from the fees collected for solid waste and green spaces management (3.23).
- (ii) the sewage management works: agreements concluded between EMPAGUA, two municipalities and private water supply companies, to charge for operation and maintenance of the sewerage system and sewage treatment plants (3.27); plan of action for introducing changes in EMPAGUA and the document transferring BANVI's sewage treatment plants to EMPAGUA (4.35, 3.14);
- c. Within 18 months, the following must be submitted: the sanitation code; regulations on pretreatment of industrial effluent and on discharging into the public sewerage system, and the GCMA's environmental monitoring plan (3.17);
- d. Any additional long-term debt that either the Municipality or EMPAGUA incurs in excess of US\$5 million must have the Bank's nonobjection. However, when this financing is intended to develop municipal services projects with private sector participation, the repayment of which will not result in a fiscal charge for the borrower, the latter will only be required to demonstrate, to the Bank's satisfaction, that this condition, from the financial point of view, will be duly fulfilled (4.31).
- e. While the project is in progress and before August 31 of each year, the Municipality will submit to the Bank the annual work plan (AWP) for the following year. Based on the AWP, in the second and fourth years the Municipality and the Bank will jointly consider any adjustments needed in the project (3.31).

The loan contract will also include the standard Bank clauses concerning, *inter alia*, auditing, progress reports, inspections, procurement and minimum rates.

I. FRAME OF REFERENCE

A. The context of municipal and environmental services management in the Guatemala City Metropolitan Area

- 1.1 A combination of macroeconomic, political, institutional and financial factors has brought about a decline in investments in Guatemala's social sectors, which has taken its toll on the country's poor. Investments in those sectors, including environmental sanitation services, which are the lowest in Central America, dropped from 5.2% of GDP in 1980 to 4.1% by 1992. As a consequence, neither the coverage nor the quality of the solid waste and sewage treatment services and management of green spaces is adequate, especially in the Guatemala City Metropolitan Area (GCMA), home to some two million people (1990), around 20% of the country's population.
- 1.2 To improve the very grave state of environmental services without upsetting, insofar as possible, fiscal equilibrium, the priorities of the new national and municipal administrations are to: (a) modernize and improve municipal management by increasing billings and reducing expenditures, all as part of the public administration's decentralization; (b) introduce cost-recovery mechanisms in the form of more suitable rate scales; and (c) get the private sector more involved in municipal services.
- 1.3 To realize these priorities, the national government is launching a process whereby responsibility for management of public services (water, sewerage, and refuse collection) is being shifted to the municipalities, which can either provide the services themselves or contract private firms to do so. The municipalities have diversified their sources of income, with property taxes, service charges, rent charged on common property, and the 10% share of the national budget's regular revenues that the municipalities receive from the central government in the form of revenue-sharing.
- 1.4 One of the keys to fiscal and financial efficiency is the municipal cadastre, which will be updated for tax purposes with a view to significantly increasing municipal revenues. If the process is to succeed, the very complex and bureaucratic administrative and financial systems will have to be modernized.
- 1.5 Private-sector involvement in the delivery of environmental services varies among the municipalities in the GCMA, particularly the Municipality of Guatemala City. As a rule water supply services are in municipal hands. Solid waste collection, by contrast, is handled by private refuse collectors (who are awarded permits to perform this function), although in some cases this service is provided by the municipalities themselves. Typically the private sector's participation is on the basis of direct contracting decided by competitive bidding for such services as:

(a) maintenance of green spaces and city parks (with businesses recouping their costs by selling advertising space); (b) water-meter reading; and (c) construction of water and sewerage works. Despite the progress made toward realizing the potential that private sector participation offers, the monitoring, auditing and regulation capacity needs to be reinforced.

B. Modernization of the Municipality of Guatemala City

- 1.6 To find a solution to the problems associated with municipal services delivery, in 1994 the Municipality of Guatemala City began drafting the Metropolitan Development Plan (Plan Metrópolis 2010). This plan examines the major causes of the problems, which include the lack of comprehensive planning, overstaffing, and inadequate fiscal management. Based on the findings of a study that examined the major urban-development issues (environment, infrastructure, transportation, the road system, and economic, social and juridical/institutional matters), the plan proposes a series of projects and reforms in public administration. The chief institutional reform strategies are to: (a) franchise services according to a set of clear and transparent rules; (b) institutionalize modernization as a permanent, ongoing process; (c) further consolidate the metropolitanization process by creating a metropolitan district, to find blanket solutions to the problems that GCMA communities have in common.
- 1.7 One of the plan's first results was the creation of an advisory office in the Municipality of Guatemala City that serves as an informal advisory board in which the private sector, the mayor and deputy mayor take direct part. Its main programs are: (a) a study of municipal restructuring, including modernization of the Municipality and of the Empresa Municipal de Agua Potable y Alcantarillado [Municipal Water Supply and Sewerage Company] (EMPAGUA); (b) implementation of the projects included under the Metropolitan Development Plan 2010, the strategy being to plan and modernize public services and promote private sector participation. Using a voluntary retirement program, the municipal restructuring and modernization would cut the number of municipal employees from 3,682 to 2,200 by the end of the present administration.
- 1.8 With the Metropolitan Development Plan 2010 now under way, contracts for the following have been let to the private sector via competitive bidding: (a) preparation of the cadastre of the Municipality; (b) computerization of the accounting systems used by the Municipality and EMPAGUA (which will mean a staffing cut of 600); (c) modernization of meter reading, which will now be done electronically; (d) maintenance and change of EMPAGUA meters; (e) construction, operation and maintenance of parking facilities; (f) traffic police, installation of more traffic signals and street signs in the city, and collection of fines and license fees; and (g) construction, operation and maintenance of the beltway. For their part, EMPAGUA and the Municipality of Mixco are already

letting contracts to the private sector for large-scale sales of water.

C. Environmental and operational problems tackled by the project

- 1.9 Given their technical and operational dimensions, the GCMA's main environmental-management problems can be summarized as follows: (a) need for continued modernization and decentralization of environmental services delivery, to make them efficient and capable of recovering costs; (b) improper handling of solid waste, which causes pollution and health problems; (c) the lack of sewage treatment, which contaminates water, causes health problems and makes water treatment more costly; and (d) shrinking of green spaces, principally in ravines, causing the kind of erosion that is not only hazardous but also lowers the quality and quantity of water. These problems are more serious in the ravines surrounding the city, where 20% of the GCMA's population now live in poverty and amid unsanitary conditions, without access to sewerage or refuse collection. The situation has deteriorated in recent years, despite the many institutions with responsibility over this area. Annex I-2 lists the public institutions involved in environmental matters.

1. Solid waste management

- 1.10 Technical considerations. Solid waste collection in the GCMA covers 60% of the 1,650 tons generated each day. The remaining 40% is thrown into some 500 clandestine, open-air dump sites, or along roads and bridges and on the banks of rivers and lakes. The main site for disposing of solid waste is the Zone 3 dump ("El Trébol"), where household refuse is dumped together with hospital and industrial/commercial waste.
- 1.11 Institutional and operational considerations. The bulk of the solid waste collection in the GCMA is done by some 250 micro-entrepreneurs. Together they have a fleet of approximately 300 trucks - most of them inadequate - and from 15 to 20 handcarts and 40 animal-drawn wagons. These microentrepreneurs employ around 930 people and charge on a residential basis; rates vary according to the provider.
- 1.12 In the Municipality of Guatemala City, the Departamento Municipal de Limpieza Pública [Municipal Public Sanitation Department] (DLPM) carries out supervisory tasks, cleans streets, parks, marketplaces, some schools and hospitals, and operates the dump. Historically, its weaknesses have been the following: (a) poor coverage and the fact that it does not collect refuse from families who cannot afford private refuse collection services or are not on their improvised routes; (b) inefficiency caused by outdated technology and poor transportation equipment; (c) a failure to map out collection routes; (d) the variety of rates charged; (e) the increasing number of clandestine, open-air dump sites; and

(f) technically, environmentally and socially inadequate operation of the official dump (El Trébol) in Zone 3. To improve the situation, last year the Metropolitan Unit for Recycling Waste, Disposal and Decontamination (UMREDD) was created as an ad hoc advisory group in charge of putting together the final plan of action for solid waste management in the GCMA. It also performs executive and planning functions, reports directly to the mayor and coordinates with the DLPM.

- 1.13 The priorities that the program will further are: (a) technological modernization (equipment and routes) of private refuse collection; (b) improvement and proper operation of the final solid waste disposal sites through specific investments and by franchising their operation and maintenance to the private sector; (c) preparation and introduction of a proper rates (and billing) system; (d) establishment and introduction of regulations for collection, transport and final disposal of solid waste; (e) introduction of a system for paying refuse collectors on the basis of the weight of the refuse received at the final disposal sites, thus ensuring that refuse is disposed of at the proper sites.

2. Sewage management

- 1.14 Technical considerations. The GCMA's untreated sewage and resulting pollution of area rivers may be contaminating local aquifers and adversely affecting public health. Between 1988 and 1995, the infant mortality rate went from 60 to 64 per 1,000 live births, the chief cause being intestinal infections associated with the consumption of contaminated water and food. Water quality in GCMA rivers is almost the same as that of sewage since in practice the rivers function as open sewage ditches. The biochemical oxygen demand in these waters is over 250 mg/liter, indicating the presence of organic pollution.
- 1.15 The existing sewerage systems reach some 60% of the population and are divided into two large basins, North and Southeast, separated by the continental divide that runs through the center of the city. The 33 small sewage treatment plants, which together can treat sewage from less than 5% of the population, are virtually out of commission due to lack of maintenance.
- 1.16 Institutional and operational considerations. EMPAGUA is the main agent in the sector. Since its establishment in 1972, it has been regulating and distributing drinking water in Guatemala City; since 1984 it has also been providing sanitation services, primarily by building and maintaining the drainage system. In political and financial terms, EMPAGUA is attached to the Municipality; it has no legal status nor is its budget entirely separate from that of the Municipality of Guatemala City. Some people get their water from private suppliers (mainly the Empresa La Mariscal) that sell well water. These people use the EMPAGUA drainage and sewerage systems,

but are not paying for it because their private water bill does not include sewerage operation and maintenance.

- 1.17 EMPAGUA has taken steps to modernize, mainly by letting contracts for meter-reading to the private sector and introducing a water tariff structure in which 20% is for sewerage service. The marketing system still is inadequate, however, with billing that covers only 50% of the water produced.
- 1.18 So that EMPAGUA can break even and decrease its use of transfers from the Municipality of Guatemala City and the central government for operating revenues, the following are the priority measures the program will support: (a) targeted investments to increase the coverage and quality of sewerage and sewage treatment services; (b) drafting and introduction of regulations to govern private sector participation; (c) a system to charge for sewerage operation and maintenance, involving agreements concluded between EMPAGUA and the private water supply businesses; (d) greater private sector involvement in the systems' operation; and (e) continued reorganization of EMPAGUA, which includes making it juridically and financially independent of the Municipality.

3. Management of green spaces

- 1.19 Technical considerations. The following are the main environmental problems caused by the spread of deforestation in the department of Guatemala: (a) erosion in watersheds has gotten worse; (b) sedimentation has increased appreciably; (c) slopes and bodies of water are deteriorating; (d) wildlife habitat is either changing or being destroyed; and (e) urban green spaces and recreational areas are shrinking. The leading causes of deforestation are urban development and the felling of trees for firewood and materials to build shanties.
- 1.20 Institutional and operational considerations. Although the Parks and Green Spaces Division is doing an adequate job of managing these areas, its management techniques and the municipal nurseries are not able to effect any appreciable increase in reforestation, the kind needed to cover the existing deficit. In some ravine areas, nongovernmental organizations (NGOs) have organized the community to replant and manage woodland areas and sow crops that the community can use.
- 1.21 Given the importance of green spaces, the project will support the following measures: (a) targeted investments to expand green spaces, mainly in areas at risk (from landslides); (b) additional private-sector and community involvement in parks maintenance and in reforestation; and (c) introduction of forestry management, monitoring, expansion and surveillance systems.

D. Government strategy for halting environmental degradation

- 1.22 The municipal government's environment-related priorities are: (a) reforestation and maintenance of urban parks; (b) better solid waste management, which includes mapping out routes and introducing efficient collection and disposal systems, eliminating clandestine dumps, and franchising services; (c) construction of sewers and treatment plants; (d) restoration and maintenance of green spaces; and (e) environmental education.

E. The Bank's strategy

- 1.23 One of the goals of the strategy that the Bank and the Guatemalan government agreed upon for the 1996 to 1998 period is to expand and upgrade social services through programs geared to improving the coverage, quality and efficiency of basic social services. Another goal of the strategy is proper management and conservation of natural and environmental resources.
- 1.24 In the specific case of water and sanitation, the Bank's strategy focuses on the sector's institutional reorganization and decentralization, which means shifting responsibility for developing and operating the water supply and sanitation systems to the local level. This operation is consistent with that strategy and also fits into the strategy aimed at increasing the services' efficiency and coverage by involving the private sector and introducing cost-recovery mechanisms. The Municipality will be responsible for repaying the debt, which means the program will place no additional fiscal burden on the central government.

F. Program design

- 1.25 Based on the findings of the metropolitan environmental and institutional diagnostic study and the surveys conducted in the communities (including surveys on the willingness to pay for environmental services), and because the coverage and efficiency of municipal services are vital factors in municipal development and quality of life, this project is being proposed as a means to help solve the most pressing environmental problems. Its design is premised on the need to tackle environmental services at the metropolitan level and to introduce radical changes in the way they are managed. Drawing upon lessons learned in Guatemala and elsewhere, these changes should include community and private sector involvement in the new management systems introduced, which are to operate by principles of efficiency, financial viability and cost recovery.
- 1.26 This program seeks to promote the first phase of investments to solve the most urgent environmental problems and will foster priority institutional reforms, with the accent on private sector and community involvement in the delivery of public services. With these measures, the program will support more efficient municipal

management, which in turn will bring about a sustainable improvement in the metropolitan population's quality of life.

II. THE PROGRAM

A. Objectives

- 2.1 The program's goal is a sustainable improvement in the quality of life of the GCMA's population, to which end the program proposes the following specific objectives: (a) improve metropolitan management of environmental services by encouraging private sector and community participation; and (b) upgrade the quality and coverage of environmental services, thereby reducing the environmental degradation caused by poor collection and disposal of solid waste and sewage, and increase availability of green spaces through investments to introduce new management systems (see Logical Framework in Annex II-1).
- 2.2 To accomplish the program's goal, its objectives will be reinforced by ATN/SF/CI-5112-GU, specifically as regards environmental land-use planning and management, air-pollution evaluation and control, environmental education and modernization of the institutional mechanisms for managing environmental services.

B. The program's structure

- 2.3 The Guatemala City Metropolitan Area environmental program consists of four components:
- a. Reform and institutional development of metropolitan environmental management (US\$3.2 million), which involves: (a) modernizing environmental public services; (b) modernizing municipal management; and (c) strengthening environmental control and monitoring capacity in the GCMA.
 - b. Solid waste management (US\$17.8 million), consisting of: (a) purchase of equipment and introduction of new solid waste collection systems covering the entire GCMA, by involving microentrepreneurial and community collection systems; and (b) introduction of systems for the sorting, treatment and final disposal of the solid waste collected throughout the GCMA (nine municipalities), which involves establishment of two sorting and composting plants and their accompanying sanitary landfills, at El Trébol (Zone 3), and Km 22 of the highway to the Pacific (Villanueva).
 - c. Sewage management (US\$5.9 million), consisting of: (a) reconditioning of existing, priority treatment plants currently out of commission; (b) introduction of sewage collection and treatment systems for slums and other priority areas (San Miguel Petapa and San José Pinula), to reinforce the EMPAGUA-JICA master plan that would be financed by another source.

- d. Management of green spaces (US\$3.1 million), which involves:
(a) reforestation of selected ravines and introduction of soil conservation techniques; (b) recovery and management of priority urban green spaces (parks near ravines); and
(c) introduction of a forestry management, extension and surveillance system at Cerro Alux, the source that feeds the groundwater springs.

C. Description of the components

1. Reform and institutional development for metropolitan environmental management

- 2.4 This component builds upon a process that the municipalities of Guatemala and Mixco have already set in motion to modernize planning and management of environmental services in the GCMA. Annex II-2 contains some of the indicators and goals of the changes and measures planned, which are described below and which will require consulting services, equipment and targeted dissemination programs.
- 2.5 **Subcomponent on modernization of municipal management.** The main activities planned are: (a) assistance to the municipalities in contracting with the private sector; (b) support to modernize the financial and administrative systems; and (c) support in preparing the municipal cadastres.
- 2.6 **Subcomponent to modernize environmental services.** The main activities planned are to: (a) promote the new solid waste management system and educate the public about it; (b) train solid waste collectors on the new collection system and how it is organized for the competitive bidding process for the new trucks; and (c) support EMPAGUA's restructuring, part of which is to make it legally and financially independent of the Municipality of Guatemala and to introduce cost-recovery systems.
- 2.7 **Subcomponent on strengthening environmental monitoring and inspection capability.** Since the design of an environmental authority is already planned under technical cooperation ATN/SF/CI-5112-GU, the main activities proposed are: (a) preparation of the solid waste regulations; and (b) development of an environmental monitoring plan.

2. Solid waste management

- 2.8 **Solid waste collection and transport subcomponent.** Investments will be made to introduce a more efficient collection and transport system, for which purpose it is proposed that the GCMA be divided into four regions, based on: (a) population, present and future volume of solid waste generated, growth of the cities and their geographic spread; (b) location of the sorting and composting

plants; (c) outsourcing of the collection and transport service to business(es) and other legal entities; and (d) supervision and inspection of collection and transport, and of operation of the sorting and composting plants.

2.9 The planned investments are to purchase 85 compactor trucks, 69 dump trucks, refuse receptacles for customers, and street cleaning and sweeping equipment, and to map routes. The collection regions are illustrated in Annex II-3 and the operating specifications appear in Annexes III-3 and III-4.

2.10 The **solid waste treatment and final disposal subcomponent** involves investments in:

a. construction work, equipment, and land to set up two sanitary landfills and to aid environmental recovery at the dumps at El Trébol (Zone 3) and Km 22 (Villanueva), with a projected capacity for all refuse collected for the next 30 years; the volume of refuse will increase as the collection system expands; and

b. construction work and equipment to launch the two sorting and composting plants that will use modern technology, recycle materials and create jobs in areas near the new landfills that will replace the existing dump sites. The plants' sorting lines will be able to accommodate 25 tons an hour. The El Trébol and Km 22 plants will each have four lines installed.

2.11 One successful (although not yet fully operational) experiment with a community-run, comprehensive solid waste sewage treatment and forestry-management service is the Alameda Norte plant in Zone 18 of Guatemala City, where refuse treatment is combined with sewage treatment and the production of compost for reforestation. This was a franchise from the Municipality of Guatemala City to the Recycling and Environmental Management and Sanitation Association (ARMSA), operated by a local precooperative committee. The program will assist this experiment, which could possibly be duplicated elsewhere, providing a locally-based, comprehensive solution to waste management and reforestation.

2.12 As for hospital waste management, the Municipality is presently negotiating a loan with the European Community. Such waste would be incinerated at San Juan de Dios hospital, with which the executing agency will sign an agreement.

3. Sewage management component

2.13 Planned measures. The measures planned are investments to complement those proposed under the sewage master plan prepared by EMPAGUA/JICA (which will be financed by a separate loan), according to top priorities for sewage conveyance and treatment, identified

by the extent to which sewage is contaminating water sources, mainly Lake Amatitlán.

- 2.14 Industrial effluent will be pretreated before being discharged at the planned sewage treatment plants (STPs), to meet standards that will be established. They will then be monitored and inspected by the CCU (see chapter III).
- 2.15 **Subcomponent to recondition existing sewage treatment plants.** The existing STPs presently out of commission, considered priorities for reconditioning, are the following: Villalobos I, Villalobos II, El Mezquital, Bello Horizonte, Nimajuyú, Justo Rufino Barrios and Alameda Norte. The reconditioning involves investments in construction work and equipment.
- 2.16 **Subcomponent on sewage treatment in slums.** This measure is intended to establish sewage treatment systems in priority slum areas. Presently, raw sewage is flowing into surface drainage works. The investments planned are for primary sewage treatment and will be in construction work, equipment and land to build septic tanks that use either sumps or elevated filter bed systems. The areas were selected according to whether or not they had sewers and based on the degree of poverty.
- 2.17 **Subcomponent for drainage systems, sewer mains and treatment plants in the Sur 4 (San Miguel Petapa) and Este 3 (San José Pinula) regions.** The investments would be in construction work, equipment and land to build the drainage systems, sewer mains and secondary treatment plants.

4. Green spaces management component

- 2.18 The **ravines subcomponent** involves investments in materials, equipment and labor for forest expansion and to replant 580 hectares of selected ravines with species native to the area and exotic species that grow quickly or produce firewood (17% of its total area, which is presently entirely stripped of trees), and to build drainage and erosion control works. The selected ravines are: El Incienso, Hipódromo del Norte, Guacamayas, Lomas de Pamplona, San Cristóbal and La Chácara.
- 2.19 Under the **urban green spaces subcomponent**, investments will be in equipment, construction work, materials and labor to plant trees and beautify 17 urban parks, for a total of 148.06 hectares.
- 2.20 The **reforestation objectives** will require investments in construction work, equipment, and labor to enlarge seedbeds, irrigation systems, and fencing around Guatemala City's municipal nurseries, la Península and Ojo de Agua. (See Annex II-4 for more details on these subcomponents.)

- 2.21 Under the **Cerro Alux reserve subcomponent**, investments will be made in equipment and construction work to install infrastructure (guard houses, vehicles, patrol equipment) for surveillance of its woodlands (which are a source of the springs that supply water to the GCMA) by a corps of radio-equipped guards (hired by the Parks and Green Spaces Department).
- 2.22 Annex II-5 summarizes the goals of the investment components.

D. Status of the program's preparation

- 2.23 The feasibility studies and terms of reference for the consulting services to prepare the final detailed scale project designs were completed (see Annex II-6). The environmental summary and corresponding environmental impact mitigation and control plan were approved by the Environment Committee on August 27, 1996, and its activities and budget will be an integral part of the program (Annex II-8).

E. The program's cost and financing plan

1. Costs

- 2.24 The program's cost estimates are summarized in the following table; the itemized budget appears in Annex II-7.

SUMMARY OF PROGRAM COSTS (in US\$ millions)				
COMPONENTS AND INVESTMENT CATEGORIES	AMOUNTS			%
	IDB	Local Counterpart	Total	
I. <u>Engineering and administration</u>				
1.1 Final designs and studies	1.4	—	1.4	3.2
1.2 Administration and coordination	0.6	0.6	1.2	2.8
1.3 Advisory services and supervision	0.8	—	0.8	1.8
Subtotal	2.8	0.6	3.4	7.8
II. <u>Direct costs</u>				
2.1 Solid waste management	15.8	2.0	17.8	40.8
2.2 Sewage management	3.9	2.0	5.9	13.5
2.3 Management of green spaces	1.3	1.8	3.1	7.2
Subtotal	21.0	5.8	26.8	61.5
III. <u>Recurrent costs</u>				
3.1 Environmental plan	0.6	0.1	0.7	1.6
3.2 Reform and institutional development	2.9	0.3	3.2	7.3
Subtotal	3.5	0.4	3.9	8.9
Total for investment components	27.3	6.8	34.1	78.2
IV. <u>Unallocated</u>				
4.1 Contingencies	1.5	1.0	2.5	5.7
4.2 Escalation	1.5	1.0	2.5	5.7
Subtotal	3.0	2.0	5.0	11.4
V. <u>Borrowing costs</u>				
5.1 Interest	3.5	—	3.5	8.0
5.2 Credit fee	0.7	—	0.7	1.6
5.3 Inspection and supervision	0.3	—	0.3	0.7
Subtotal	4.5	—	4.5	10.3
OVERALL TOTAL	34.8	8.8	43.6	100.0
PERCENTAGE BREAKDOWN	80.0	20.0	100.0	

2. The Bank loan and local counterpart contribution

2.25 Loan. The borrower will be the Municipality of Guatemala City, while the guarantor will be the Republic of Guatemala. The loan will be for the equivalent of US\$34.8 million from the Bank's ordinary capital resources, with an Intermediate Financing Facility subsidy since: (a) Guatemala is eligible to use the IFF under the Eighth Replenishment (document AB-1683); (b) peace in Guatemala is in the process of being consolidated; (c) a significant percentage of the loan's beneficiaries are from low-income groups; and (d) for

the first time, the Municipality of Guatemala City will be responsible for repaying the loan, which means that the financial burden will have significant impact on the project's financial viability and the Municipality's borrowing capacity. The use of IFF resources is proposed for a buydown of as many as five percentage points of the interest rate on the total loan amount.

- 2.26 Local counterpart funding. The local counterpart funding is approximately US\$8.8 million equivalent (20% of the total), financed by the Municipality of Guatemala City and backed by the Guatemalan government's guarantee. The financial analysis shows that the Municipality will generate sufficient revenues to meet its local counterpart obligations. However, negotiations are under way to obtain cofinancing to finance the local counterpart retroactively, once the peace agreements have been signed. The country that has shown the most interest in providing this financial support is Norway.

III. PROGRAM EXECUTION

A. Plan of execution

- 3.1 The Municipality of Guatemala City will be responsible for carrying out the program and, to that end, will put together an organizational structure consisting of: (a) an executive tier, in the form of the program's executive council; (b) an operations-coordination tier, in the form of the central coordinating unit (CCU); (c) a technical tier, comprising the three technical execution units (TEUs); and (d) a tier for technical advisory services and works supervision and consisting of the engineering firm contracted for that purpose. As part of ATN/SF/CI-5112-GU, already approved by the Bank, a metropolitan superintendency of environmental planning and management will be created, thus adding another tier for regulation and inspection.
- 3.2 Participating in the program with the Municipality of Guatemala City will be another eight municipalities in the GCMA. 1/ Except for Mixco, all have formally advised the Bank of their interest in participating in the program.
- 3.3 The mayors of the participating municipalities will sit on the program's executive council, whose function is to serve as the program's highest ranking executive body. The terms and conditions of the municipalities' participation in the program will be stipulated in a charter agreement, which will be submitted to the Bank a condition precedent to the first disbursement of loan proceeds. The content of the agreement appears as Annex III-2.
- 3.4 The CCU will coordinate program operations. Attached to the Office of the Municipal Mayor of Guatemala City, it will coordinate fully with the Plan de Desarrollo Metropolitano [Metropolitan Development Plan] (PDM) and with the Office of Strategic Planning. Its executive staff will consist of a general coordinator and four deputy coordinators for the solid waste management component, the sewage management and green spaces component, and the institutional reform and development and environmental planning component, and to handle the program's administrative, financial and accounting functions. It will also have support staff. Its budget and functions are described in Annexes II-6 and III-1.
- 3.5 The TEUs will be the technical-operational units for the program in every municipal office with line responsibility over services related to the planned investments (the Public Services Office-Sanitation Division for the solid waste component; the Works

1/ Amatitlán, Chinautla, Mixco, San José Pinula, San Miguel Petapa, Sta. Catalina Pinula, Villa Canales, Villa Nueva.

Construction Office-Parks and Green Spaces Division for the green spaces component; and EMPAGUA for the sewage component). The TEUs will be the nexus for making the program part of the Municipality's regular functions, in coordination with the CCU, which will be directly in charge of the institutional reform and development component. The TEUs will have a fixed number of technical personnel, whom the directors of the aforementioned municipal offices will appoint by mutual agreement with the program's general coordinator.

- 3.6 A consulting and supervision firm will be hired to advise the CCU and the TEUs on program execution. It will prepare the final designs for the works to be built, advise on the bidding and contracting procedures and oversee construction. The CCU will also have advisory assistance for its functional-operational organization and for the specifics of the terms of reference (see Annex III-1).
- 3.7 The organizational structure that the Municipality will have to create to carry out the program must conform to the specifications in Annex III-1; its approval by the program's executive council is a condition precedent to the first disbursement.

B. Operations

- 3.8 Solid waste management component: Under this component, the GCMA's solid waste collection, treatment and disposal services will be considerably improved thanks to investments in works and equipment and reorganization of the management systems. Under this new system, the Municipality of Guatemala City will contract firms to: (a) operate and maintain the plants and landfills to be built; (b) collect solid waste; and (c) administer the proceeds from billings.
- 3.9 For collection purposes, the GCMA will be divided into four zones. Contracts will be let to private firms, including those already providing that service in the city. Some of the low-income people who now sort through refuse (*guajeros*) for articles to sell will be hired at the sorting and composting plants built under the program and operated and maintained by specialized firms contracted by the Municipality (Annex III-4).
- 3.10 The refuse collection businesses contracted under the program must meet certain technical and health standards to be established, such as the type of transport unit used, the collection methods, remuneration based on weight of refuse delivered to the plants, etc. (see Annex III-3). In hard-to-reach areas and in marketplaces, microentrepreneurs will collect the refuse and deposit it into special receptacles. The refuse collection businesses will then pick up that refuse and transport it to the plants for final disposal.

- 3.11 The refuse-collection equipment purchased by the Municipality with program resources will initially be leased to the firms and persons selected to operate and maintain them. The final terms of the lease agreements will be worked out with the Bank. In the selection process, priority will be given to natural or juristic persons that are experienced in providing this service locally.
- 3.12 One of the important eligibility requirements that will appear in the bidding documents for procurement of the equipment is the contractual obligation of the successful bidder to provide maintenance locally, including supplies of spare parts. It must also agree to design and conduct training programs to teach operators and contractors how to operate and maintain the equipment.
- 3.13 With proceeds from service charges, a reserve fund will be established to replace the refuse-collection units at the end of their useful life. The terms for operation of this reserve fund will be part of the preliminary plan for outsourcing solid waste management services to the private sector, which is to be submitted to the Bank as a condition precedent to the first disbursement of loan proceeds. That plan will specify what methods will be used to let service contracts to the private sector and will include specifics on how the equipment will be sold, leased, maintained and replaced, as well the respective schedule of execution. The Municipality will be contractually required to submit the final version of the aforementioned plan, including any changes agreed upon with the Bank, before calling for proposals on the refuse-collection equipment and/or planned construction work.
- 3.14 Sewage management. EMPAGUA will be in charge of the bid process involving contracts to recondition and build the sewage treatment plants and septic tanks. To that end, the STPs to be reconditioned must be transferred from the Banco Nacional de la Vivienda [National Housing Bank] (BANVI) to EMPAGUA under an agreement that must be submitted to the Bank as a contractual obligation prior to issuing a call for bids for sewage management works. It will also: (a) operate and maintain those plants; and (b) introduce the rates for the service, including the fee that it will charge private water supply companies whose customers use EMPAGUA drainage systems.
- 3.15 Management of green spaces. The Parks and Green Spaces Division of the Municipality of Guatemala City will be responsible for this component and will do the necessary contracting. It will also manage the nurseries, which are a crucial element since, if plants of the required quality and quantity are not available, the targeted goals cannot be achieved. The Municipality will contract private companies for the reforestation work. The plan is to use labor from surrounding communities to spark their interest in protecting the replanted areas.

- 3.16 Institutional reform and development. The CCU will hire the consultants, organize the seminars and purchase the equipment planned under this component. It will also oversee the proper execution of the technical aspects of this component are properly carried out.
- 3.17 Operating instruments. The participating Municipalities will prepare and put into effect the regulations necessary for the services to run properly, among them: (a) the sanitation code; (b) pretreatment standards for industrial effluents and the conditions under which they can be discharged into public sewers; and (c) the GCMA's environmental monitoring plan. This clause in the contract must be performed **within 18 months** of the date of the loan contract.

C. Procurement of goods and services

- 3.18 The Bank's policies and procedures will be followed to purchase the goods and contract the consulting and other services financed under the program. To purchase equipment, materials and other goods required to carry out the program and to contract for works, prequalification of contractors and international competitive bidding will be required whenever the equipment and material purchases exceed the equivalent of US\$250,000 and the construction works exceed US\$1.5 million. Purchases and contracts for lesser amounts, or financed entirely with the local counterpart funding, will be done in accordance with domestic law.
- 3.19 Under Guatemalan law, contracts or franchises are awarded to the private sector as follows: (a) for amounts under Q300,000, by invitation with three price quotations from which to choose; and (b) for amounts in excess of Q300,000, local competitive bidding announced in the newspapers to draw responses from which a short list (10 firms in general) is selected. The Municipal Council appoints a tendering committee to select the winning firm; that committee also approves franchises and direct contracting, with oversight by the Municipal Comptroller's Office and by the Comptroller General of the Republic (see Annex III-5 for a list of the procurements of goods and services planned under the program).

D. Disbursements timetable

- 3.20 Table 3.1 shows the disbursements planned over the five-year life of the program.

Table 3.1: Planned disbursements timetable (US\$ millions)							
Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total	%
I. IDB	3.5	10.4	10.4	7.0	3.5	34.8	80.0
II. Local counter- part <u>1/</u>	0.9	2.6	2.6	1.8	0.9	8.8	20.0
Totals	4.4	13.0	13.0	8.8	4.4	43.6	100.0
Percentages	10%	30%	30%	20%	10%	100.0	
<u>1/</u> The local counterpart does not include the cost of the land.							

E. Advance of funds

- 3.21 Given the investment and disbursement timetables and the manner in which the program will be carried out, an advance equivalent to 10% of the total loan amount is recommended. At the executing agency's request and with the Bank's approval, that advance could be increased to the equivalent of 20% of the loan amount. The executing unit will remit these resources, which must be used within 120 days of being received; an explanation of their use will be required within 180 days.

F. Retroactive financing and recognition of local counterpart

- 3.22 The Bank may recognize as part of the local contribution to the project, up to the equivalent of US\$500,000 in outlays for designs, studies and activities associated with those specified for each component, made prior to the date on which the Board of Executive Directors approves the resolution but subsequent to March 11, 1996. Also with the Bank's acceptance, the resources of the financing may be used to reimburse for past expenditures or to finance project expenditures from the date of approval of this loan, provided that requirements substantially similar to those established under Bank policy have been fulfilled.

G. Cost-recovery mechanisms

- 3.23 Solid waste. The rate structure to recover costs under the solid waste component will be devised by the firm hired to prepare the final designs and must be approved by the various Municipalities participating in the program. The user charge will appear on the monthly bill from the electric power company. This billing system is one of the keys to this component's financial viability, because in this way virtually the entire population served can be charged for the service. Rates will be structured to suit the ability to pay of the various customer groups. Under the loan contract, the agreement between the participating Municipalities and the electric power company for the latter to bill and collect for this service must be concluded before calls for bids are issued for the

collection units and construction work planned related to solid waste and green spaces management.

- 3.24 The proceeds from the refuse fee will be administered by a specialized firm which, under the loan contract, must be hired before calls for bids are issued for the procurement of collection units and for contracts for solid waste and green spaces management works. Those proceeds will be used to pay the service-delivery costs and to service the debt incurred with the Bank to finance this component. Specifically, the proceeds from refuse-collection fees are to cover the costs of: (a) refuse collection, based on vouchers issued by the treatment and disposal plants, which will pay according to the weight of refuse received; (b) the amount that the firms that operate the sorting and composting plants are owed under their respective contracts; and (c) a reserve fund to finance replacement of refuse-collection equipment.
- 3.25 Parks and green spaces. The investments made under the parks and green spaces component will also be recovered by means of a special fee, which the participating Municipalities must approve and which will also appear in the electric power bill. Once the percentage for debt service has been deducted, proceeds from the fee for parks and green spaces will be remitted to the Parks and Green Spaces Division of the Municipality of Guatemala City. Private firms will be hired to maintain urban parks in exchange for advertising space.
- 3.26 The fees charged for these two components will depend on the user's socioeconomic circumstances; nonresidential customers will be charged under a different rate structure. Proceeds from the fees will cover: (a) the administration, operation and maintenance costs of the solid waste collection, transport and treatment service; (b) the expansion and maintenance of green spaces, mainly in ravines; (c) service of the debt with the Bank; and (d) the costs of collecting, administering and monitoring those revenues. The electric power company will bill for the fee, under an agreement concluded with the Municipality.
- 3.27 Sewage. This component's costs will be recovered through a specific sewerage charge on EMPAGUA's bill to users. EMPAGUA will also charge for the sewerage service that customers of private water supply companies or municipalities receive. It will also charge for service in the municipalities of San Miguel Petapa and San José Pinula. The proceeds from those fees is to cover the costs of operating, managing and maintaining those investments and the sewage component's share of the debt service that the Municipality of Guatemala City must pay to the Bank.

H. Maintenance

- 3.28 Either directly or through contracts let to the private sector, EMPAGUA will operate and maintain the sewage treatment facilities. The Municipality's Parks and Green Spaces Division will be

responsible, directly through contracts with private firms and NGOs, for maintaining the investments made to replant the ravines and maintain the city parks under the supervision of the Parks and Green Spaces Division. Maintenance of the works and equipment under the solid waste component will be the responsibility of private firms, under the supervision of the DLPM.

- 3.29 Each Municipality participating in the program will be responsible for maintaining the equipment it receives under the institutional component.

I. Regulation and inspection of services

- 3.30 The metropolitan regulatory agency to be established under ATN/SF/CI-5112-GU will regulate and check the quality of the services.

J. The program's annual work plans (AWPs)

- 3.31 Execution of the program will be evaluated on the basis of annual work plans (AWPs) which the CCU is to submit to the Bank before August 31 of each year, having prepared them by mutual agreement with each TEU. These plans will detail the activities scheduled for the following year and include the timetables for issuing calls for bids, for contracting consulting services and firms and for execution of their respective functions as well as for construction work and purchases of machinery, equipment and other goods.
- 3.32 The AWPs will also indicate any problems anticipated for the various components, staffing needs, reassignment of functions, informative courses, training, the promotional campaigns, the progress made in strengthening the participating municipalities, the tentative dates set for putting the environmental standards into effect, manuals of technical procedures and the planned operational, institutional and financial reforms.
- 3.33 To evaluate and follow the program's various components, the CCU, using the indicators and means of verification described in the Logical Framework, will submit, to the Bank's satisfaction, the following reports as part of the AWP:
- a. A report on the situation as of the start of the program, with a detailed description of the method used to evaluate it. This report will be submitted only once, at the time of the first AWP;
 - b. An update of the socioeconomic data on the beneficiaries; an update on the progress made with the components for institutional reform and development, solid waste management, sewage management, and green spaces management; and

- c. Specific indicators of the progress made toward the goal of improving the environmental problems that the program targets and indicators of the investment components' financial sustainability and of improvement in the fiscal situation of the participating municipalities and EMPAGUA. 2/
- 3.34 Based on the AWP, in the second and fourth years the Municipality and the Bank will jointly evaluate any adjustments that should be made to the project.

2/ The executing agency will make the results of the environmental monitoring plan public, for which purpose it will publish bulletins semiannually.

IV. THE BORROWER, GUARANTOR AND EXECUTOR

A. Borrower

- 4.1 The Municipality of Guatemala City will be the borrower and will put up the corresponding local counterpart according to the disbursements timetable for the program.

B. Guarantor

- 4.2 The Republic of Guatemala will be the guarantor for the loan. It will also guarantee that the Municipality of Guatemala City puts up the local counterpart required for the program, in the appropriate amount and at the proper time.

C. Executing agencies

- 4.3 Execution of the program will be in the hands of the three Guatemala City municipal offices mentioned earlier (Chapter III), coordinated by the central coordinating unit (CCU), which pursuant to the loan contract, the Municipality must formally establish prior to the first disbursement.

D. Institutional-financial framework of the Municipalities in Guatemala

- 4.4 In Guatemala, Municipalities have legal status under public law and their own capital. There are now 330 Municipalities nationwide. Under the current Municipal Code, Municipalities perform their administrative functions autonomously and are required to provide the essential public services. Municipal government is run by the respective town/city council, composed of a mayor, who presides, representatives, and council members.
- 4.5 The Municipalities raise revenues from local property taxes and fees for the services they provide, revenue from common property, contributions from third parties, sale of products, and so on; they also receive 10% of the current revenues that, in accordance with the Constitution, the central government includes each year in the national budget. Several variables are factored in when determining a Municipality's portion of the revenue sharing, one of which is its registered population.
- 4.6 The Municipality of Guatemala City is the seat of the department of Guatemala and the nation's capital. It is governed by Decree 58-88 and the Municipal Code and has the authority to enter into service contracts, to negotiate loans to finance infrastructure, and to oversee, audit and move forward the financial and administrative affairs of investment projects benefiting the community and to further their development jointly with other neighboring

municipalities, in order to accomplish their goals. Being a public institution, the Municipality is governed by special laws that regulate its procurement and contracting procedures, employee benefits and others.

- 4.7 Organizational structure of the Municipality of Guatemala City. The **Municipal Council** serves as the deliberative and decision-making body of municipal government and administration; it audits administrative measures, issues regulations and internal ordinances, enforces the Municipal Code and legislates on municipal affairs. It also sets the rents on municipal property, rates for local public services, and compensation paid to private property owners whose property is affected by municipal works, and appoints arbitrators. The present Guatemala City Municipal Council, whose term began in February 1996, is composed of the mayor, who presides, four representatives, and 12 members, all elected by popular vote to a four-year term.
- 4.8 The **Mayor's Office** is subordinate to the Municipal Council and is headed by the mayor, its highest ranking executive officer. The mayor's job is to enforce ordinances, regulations, agreements, resolutions and other decisions of the Municipal Council, to issue orders and instructions and order police and government measures. The Mayor's Office is subdivided into bureaus, secretariats, and municipal advisory offices, all of which are under his authority.
- 4.9 The Empresa Municipal de Agua Potable y Alcantarillado [Municipal Water Supply and Sewerage Company] (EMPAGUA), a semiautonomous municipal institution, will be executor of the program's sewage management component. The findings of the institutional-financial analysis of EMPAGUA appear in Annex IV-7 and are summarized in section "C" of this chapter. During the program, EMPAGUA will be endowed with the functional autonomy necessary to operate properly.
- 4.10 Program strategy for the Municipality's development. To reverse the decline in Guatemala City's public services and correct its obvious institutional problems, the previous two administrations enlisted the private sector's technical and financial support and engaged the services of a consulting firm to put together the "Metropolitan Development Plan 2010" program. Under that program's direction, the "Metropolitan Development Plan" (PDM) was prepared in 1995. Under the PDM, by the year 2000 the Municipality is to have implemented viable and concrete solutions to the city's major problems and have rescaled the city's operations and finances.
- 4.11 The PDM details policies and strategies so that in the medium term refuse collection services, urban transportation, markets, potable water, sewerage, recreation, green spaces, and police will cease to be a draw on municipal coffers and will instead be administered, operated and maintained through institutions in the private sector.

The PDM also contains guidelines on zoning and land-use management, housing, health, education, the environment and reforms and strengthening in the court system.

- 4.12 In 1995, the Municipality also created the Office of Strategic Planning and Project Development to provide technical support for plans and operating strategies. Through the PDM and the Office of Strategic Planning, city officials are devising solutions to correct problems and weaknesses in the areas of accounting, treasury, data processing, supplies, assessment and collection of taxes, through contracts.
- 4.13 Through the PDM and the Office of Strategic Planning, the Municipality will be able to lay the groundwork for proper institutional and financial development and to improve municipal services by relying on private sector participation. Therefore, the program being proposed here should be coordinated with its guidelines.
- 4.14 Improvement of the Municipality's financial administration is crucial. Given the progress achieved thus far in this process, a clause has been included in the loan contract to the effect that within 12 months of the effective date of the loan contract, the Municipality is to submit evidence of having contracted with the private sector for the operation of a cadastre and of its accounting, treasury, data processing, supplies, and tax assessment, billing and collection systems.
- 4.15 While the Municipality had some 6,300 people on its payroll back in 1986, since then city officials have instituted policies to optimize its human resources through a process of reclassification and downsizing. As a result, by 1996 the city's active payroll was down to 3,682 employees, a 40% reduction. The Municipality also has some 1,743 pensioners who account for around 30% of its personnel costs.
- 4.16 The present administration is focusing on staff restructuring to: (a) reduce the 90 types of posts within the city's administration by half; and (b) have fewer but professionally better qualified and better paid permanent employees. Its plan is that between 1997 and 1999, its present payroll will be gradually reduced until it is no more than 60% of what it is now. This will be done by creating "voluntary retirement options, with special compensation" and by granting municipal service contracts to firms that agree to hire a portion of the downsized city employees.

E. Financial aspects of the Municipality of Guatemala City

- 4.17 The income, expenditure and investment figures used when examining the Municipality's financial performance in the four years from 1992 to 1995 were those it reported on its budget-performance statements. A comparison of these figures appears as Annex IV-3,

converted into U.S. dollars. ^{3/} To eliminate possible skewing when interpreting the Municipality's financial performance, corrections were made for some of the atypical income that the Municipality received from the central government in certain fiscal periods.

- 4.18 That analysis and the financial projections for the 1997 to 2007 period indicate that, based on premises devised as a function of long-term objectives, the Municipality of Guatemala City will have the financial means to: (a) make the local counterpart contribution required for the program; and (b) be the borrower of the proposed loan. All the same, the program has a cost-recovery system to cover payment of service on the debt. The findings of the analysis are discussed below.
- 4.19 Current surplus: In each fiscal year of the four examined, the Municipality showed a current surplus in its budget performance. This was because its total income (current revenues and capital earnings) exceeded total expenditures (operating expenditures, borrowing costs and current transfers). At 1995 prices, the surplus was US\$10.3 million in 1992; US\$8.4 million in 1993; US\$5.4 million in 1994, and US\$6.5 million in 1995. Despite the variations, these figures are indicative of positive current performances and a reasonable and appropriate financial-budgetary performance.
- 4.20 Investments: Thanks to the current surplus registered in each fiscal period examined, the Municipality was able to carry out investment plans in infrastructure works. The amounts involved, the percentage financed out of the current surplus, and the percentage of total revenues the investments represented are shown below:

Millions of 1995 US\$	1992	1993	1994	1995
Investments	\$11.0	\$9.5	\$7.4	\$11.0
Surplus/investments	93.6%	88.4%	73.0%	59.1%
Investments/total income	36.1%	32.3%	24.4%	38.7%

- 4.21 The above figures show the following about the investments: (i) they averaged US\$9.7 million a year; (ii) an average of 78.5% of the investments were financed out of the current surplus each

^{3/} The consumer price index as of the end of each fiscal period and the official exchange rate as of December 31, 1995, published by the Bank of Guatemala, were used.

year; (iii) the annual investment costs were equivalent to one third of the average total income; and (iv) they were made with loans from the national government, CABEL, the World Bank, the Central Bank of Italy, etc. From a financial standpoint, these annual investment plans were carried out on the basis of appropriate and reasonable premises and criteria, and took into account the Municipality's financial circumstances.

- 4.22 Borrowing: To finance its expenses and investments during the four-year period examined, the Municipality resorted to institutional credit averaging US\$2.8 million a year. The figures for borrowing exceeded 10% of the Municipality's income only once, in 1995. Borrowing was higher that year because current revenues were lower.
- 4.23 Total income: A combination of current revenues and capital earnings, total income was for the most part stable. The only exception was 1995 when it was down by 6% because of a decline in the "other tax categories". Total income has held steady, averaging US\$29.8 million a year. The figure budgeted for 1996 is US\$30.2 million.
- 4.24 Current revenues: The Municipality's current revenues are a combination of tax revenues, nontax revenues and current transfers and average 84.4% of total income. Current revenues in 1996 are expected to be 20% higher than they were in 1995.
- 4.25 Street-lighting charge: This category, which falls under the heading of tax revenues, was up 400%, from US\$2.1 million in 1992 to US\$11.7 million in 1995. The Guatemalan Electric Power Company charges this fee on a monthly basis, on all real estate registered on the city's cadastre. The increase is due to the fact that the charge is a percentage of the monthly electric power bill and was increased from 10% to 13%. In 1995, this fee generated 40% of the Municipality's total income.
- 4.26 Single real estate tax: This is the second most important source of tax revenues and in 1995 accounted for 20.3% of all tax revenues and 12.3% of the Municipality's total income. Assessment and collection of this tax is severely flawed owing to the fact that: (a) the real estate cadastre upon which it is based is outdated; (b) the property tax valuation is below the actual market value; and (c) the assessment, billing and collection systems are cumbersome and ineffective. Presently there are approximately 185,000 tax-paying properties on record, when the actual number of taxable properties is believed to be more than double that number.
- 4.27 City officials plan to hire a firm to administer the cadastre, which will include valuation, assessment, billing and collection of the single real estate tax. Because this contract is important to the Municipality's economic and financial future and to this program, a clause is included in the loan contract to the effect

that the Municipality must contract that firm within 12 months of the effective date of the loan contract. By conservative estimates, two years after the firm is contracted, the single real estate tax should be generating street lighting revenues of around US\$13.5 million; two years later this figure will have climbed to US\$17 million, which would be a 380% increase over the 1995 figure.

4.28 Total expenditures: These are the operating expenditures, borrowing costs and current transfers and total the equivalent of US\$22.2 million, which is 74% of average total income for the same period. Estimates are that in 1996 total expenditures will be US\$19.7 million, which is 10% less than in 1995. City officials plan to continue to cut operating expenses.

4.29 Transfer to EMPAGUA: The Municipality has been taking over the operating deficits that EMPAGUA has been incurring each year in its operations. ^{4/} These transfers were done through a special administrative-accounting procedure: the electric power company collects EMPAGUA's bill for electric power to operate the plants and pumping systems used to provide water service, from the proceeds of the street-lighting fee that the power company bills for on its monthly statements. When the nature and origin of these transfers were examined, they were not found to constitute an operating subsidy per se, since in the final analysis EMPAGUA's customers will be paying through taxes for the electric power that EMPAGUA uses.

4.30 Internal and external debt: Borrowing as of December 31, 1995, was as follows:

INTERNAL DEBT (US\$ thousands)	3,584
Municipal bonds in circulation	220
Central government loan (urban transportation)	3,364
EXTERNAL DEBT (US\$ thousands)	12,213
Loans	8,516
Loan Mediocredito Central de Italia	2,074
IBRD loan 29720	1,623
TOTAL DEBT AS OF DECEMBER 31, 1995	15,797

4.31 The liabilities of the Municipality of Guatemala City include IDB loans (353/SF-GU, 540/SF-GU and ATCN/SF-2313), which as of 12/31/95 had a balance due of US\$30 million. This figure was not included in the total debt, since the resources were transferred to EMPAGUA to finance projects in the water and sanitation sectors. EMPAGUA

^{4/} At 1995 prices, transfers to EMPAGUA were US\$1.5 million in 1992; US\$3 million in 1993; US\$7.8 million in 1994 and US\$5 million in 1995. The estimate for 1996 is US\$2 million.

has been making regular payments toward the principal and interest owed. The analysis of the Municipality's debt shows that it has been servicing its debt to its creditors regularly. The amount of the debt is reasonable, and the bulk of it is long-term and has no appreciable effect on cash flow. Nevertheless, the loan contract stipulates that the Municipality must request the Bank's nonobjection when contemplating additional long-term debt in excess of US\$5 million or the equivalent thereof. When this financing is intended to develop municipal services projects with private sector participation, the repayment of which will not result in a fiscal charge for the borrower, the latter will only be required to demonstrate, to the Bank's satisfaction, that this condition, from the financial point of view, will be duly fulfilled.

- 4.32 Financial projections: The financial projections in Annex IV-2 were prepared to estimate the Municipality's financial performance in the 1997 to 2005 period. They were based on reasonable and realistic assumptions considering the country's macro- and microeconomic variables. According to those figures, the Municipality's financial performance during that period would be one of moderate, positive growth, from which one can infer that it will have the liquid resources needed to cover the local counterpart funding of the program and service its financial obligations. One of the crucial factors underlying the increase in projected income is the assumption that the Municipality will, as of 1997, have a new system for administering, assessing, billing and collecting the single real estate tax, which is to be handled by a specialized firm in the private sector.
- 4.33 Of the annual expenditures anticipated during the 1997 to 2005 period, the transfers to EMPAGUA to cover its operating deficits will continue only until 1996, since as of 1997 EMPAGUA will have to raise the rates it charges for its services to cover its operating deficits.

F. EMPAGUA's institutional-financial framework

- 4.34 As mentioned before, EMPAGUA is part of the Municipality of Guatemala City. Its board of directors is chaired by the mayor; its other members are appointed by the city council. EMPAGUA's manager is appointed by its board of directors from names proposed by the mayor, and his/her most important decisions have to be cleared by the council. Under this system, EMPAGUA has neither operational nor financial autonomy. The institutional, operational, rate-related and financial aspects are described in greater detail in Annex IV-7.
- 4.35 Given these weaknesses, the loan contract will require that EMPAGUA begin executing a strategic plan of institutional and financial reforms (Annex IV-8) before contracting firms to build the works to be financed under the sewage management component.

- 4.36 That plan will include measures to improve EMPAGUA's operations, among them the following: (a) as of 1998, EMPAGUA is to have full administrative, operational and financial autonomy; (b) rates are to be adjusted to cover costs; (c) capital assets not yet shown on the books are to be posted; (d) contracts are to be let to the private sector for design and execution of housemetering, billing and collection systems and a program to replace, repair and maintain networks, mastermeters and housemeters; (e) contracts are to be let to the private sector to update the register of water supply service users, so as to add to its billing and collection system any connected users who are using the sewerage system without paying for it; (f) amounts past due from private customers are to be collected; (g) amounts it owes to central government and municipal agencies and offices are to be paid off; (h) the ratio of active EMPAGUA personnel per 1,000 connections is to be gradually reduced; and (i) a new financial system is to be created for its staff retirement plan.

G. External auditing of the program and its executing agencies

- 4.37 The financial statements of the program, of the Municipality of Guatemala City and of EMPAGUA are to be audited each year by a firm of independent public accountants. The loan contract will stipulate that the audited financial statements must be submitted every year, within 120 days of the close of the budget period.

V. VIABILITY AND RISKS

A. Technical viability

- 5.1 Simple projects have been selected for this program, involving relatively unsophisticated and easy-to-apply technologies. Whenever possible, preference has been given to technologies that rely on Guatemalan raw materials and equipment. For the solid waste and sewage components, the solutions proposed have worked in other countries and have been adapted to suit conditions in the GCMA; the equipment selected is easy to operate and maintain. Under the green spaces component, the species selected are suited to local climatic and edaphic conditions and are currently being grown in municipal nurseries.

B. Environmental viability

- 5.2 The program will have no significant negative environmental effects and will go far to correct some of the GCMA's most pressing environmental problems. A plan to mitigate and control environmental impact (Annex II-8) will be carried out to minimize any negative environmental effects associated with the construction and operation of program-financed works and services. The cost of these measures is figured into the program's total budgets. When resources budgeted for the financing of environmental impact mitigation and control measures - including additional costs that may be required on the basis of the additional environmental studies provided for under the project - turn out to be inadequate and no additional sources of financing are identified, necessary adjustments in the project's investments will be agreed upon in order to transfer the resources from such investments to finance the aforementioned measures in their entirety.

C. Socioeconomic viability

- 5.3 At the prefeasibility stage of the studies, alternatives appropriate for the various program components were considered and the least-cost solutions capable of achieving the expected results on the necessary scale and with the necessary quality were selected. The feasibility studies then focused on the least-cost solutions already selected.
- 5.4 Each of the program's three investment components has been examined separately to confirm the ratio of its costs to its economic benefits. The greater effort was directed at measuring the benefits, which, given the nature of the program, are mainly in the form of services that have no market price. In the case of the solid waste and green spaces components, this problem was tackled by resorting to a contingent valuation of the benefits, using referendum-type surveys among potential beneficiaries to ascertain

their willingness to pay (WTP) for the planned services. Private and public businesses rely heavily on this type of market research to find out whether consumers will be interested in purchasing goods or services not yet on the market. See Annex V-1 for the results of the contingent valuation of benefits.

- 5.5 To get the subjects to be forthcoming about their actual WTP, they were told that if the program is carried out, the refuse collection and green space protection services would be charged on the electric power bill. That would mean that the majority of the population would actually be charged, since around 90% of the families in the GCMA are connected to the electric power system. Also, rates can be scaled to the various income and use categories into which electric power consumers are classified.
- 5.6 However carefully the surveys are done and the data analyzed, the values obtained for the WTP may still be skewed; and there is also a standard deviation to consider with statistical figures. The WTP figures and the resulting internal rate of return should therefore be regarded with caution. In the case of the green spaces component in particular, the WTP may be upwardly biased because of the expectation among the subjects that reforestation of the ravines and parks may increase physical safety and reduce crime in neighboring areas.

RESULTS OF THE ECONOMIC ANALYSIS						
Component	Investment amount (US\$ thousands)	Present value of net benefits (US\$ thousands)	IRR (%)	IRR sensitivity (%)		
				Benefits		Costs +20%
				-20%	-50%	
Solid waste	21,007	94,127	42.4	33.7		35.1
Green spaces	1,815	63,967	>50.0		>50.0	>50.0
Sewage						
San José Pinula	2,107	378	15.3	11.6		12.2
Ojo de Agua	5,051	934	15.4	11.6		12.2
San Miguel Petapa	(1,896)	(222)	14.2			
Alameda Norte	(246)	245	12.2			
Villalobos 1	(223)	264	32.6			
Villalobos 2	(244)	216	27.6			
El Mezquital	(148)	186	33.9			
Bello Horizonte	(139)	64	20.3			
Nimajuyú	(19)	291	>50.0			
J.R. Barrios	(35)	558	>50.0			
Septic tanks	(2,111)	(-824)	3.7			

5.7 Solid waste. The high economic return figures testify to the fact that the urban population is anxious to find some solution to the unpleasant pollution that the dumps generate and to the problems caused by the lack of a city-wide solid waste collection system. The urban inhabitants indicated a WTP of Q38 per month per family (US\$6.36, which is equivalent to 1.1% of the average family income in 1995) to introduce the proposed system for collection, treatment and final disposal of solid waste. This WTP is well above the average monthly fee of Q21 per user required to cover the full cost of this component.

5.8 The investment costs and costs of operating and maintaining the plants and landfills were combined. Also included were the total investment, operation and maintenance costs of the refuse collection system. The construction work required at the landfills and the work needed to organize the refuse collection system mean that it will be two years before the system is fully operational. No benefits will be seen until the program's third year. Since it will take time to get the system operating properly and to shut down the clandestine dump sites, the view is that 50% of the benefits will be realized in the third year, 75% in the fourth, and 100% by the fifth year.

- 5.9 Green spaces. The high economic return rate obtained is because the benefits are great when compared to the relatively low operation, maintenance and investment costs required to recondition and protect green spaces in the GCMA.
- 5.10 The survey done to measure the public's WTP to preserve green spaces was designed to put a premium on the anticipated benefits: recreation and access to the preserved areas, protection against landslides and erosion, limited cutting of firewood and the indirect effects on the quality of the water, air and climate in the GCMA. The results of the survey showed an average monthly WTP of Q20 (US\$3.42) per family to have the improvements planned under this component. However, that WTP may be upwardly biased by an unfounded expectation that reforestation of the ravines and parks will deter crime. However, the WTP obtained is much higher than the average monthly charge of Q1 needed to cover all the costs of this component.
- 5.11 As for measuring the benefits, the time needed before the anticipated benefits from the works will accrue was factored in. Thus, the benefits in the first year will be 2.5% of what they will be eventually. The benefits increase gradually each year; by the eighth year after the works are initiated, 100% of the benefits will be realized.
- 5.12 Sewage. The sewage to be treated under this component is now draining into surface waters. Those waters, in turn, are contaminating the Ojo de Agua underground aquifer, which is the source of 40% of the city's drinking water and downstream feeds into Lake Amatitlán. The cost of the studies needed to measure the losses in recreation, the effects on health and sanitation and the damage resulting from other uses of that water would be disproportionate to the modest scale of the works planned under this component. Therefore, the only benefits considered were the increases anticipated in the costs of treating the water sources being contaminated by sewage. Also, only the percentage of the costs of that portion of the water that will be treated from the total polluting sewage were considered.
- 5.13 For the construction work to recondition the six BANVI plants and the Alameda Norte plant, to install the septic tanks in marginal areas and for the investments in San Miguel Petapa, the benefit is the savings realized on the cost of correcting the contamination in the Ojo de Agua aquifer, since that wastewater passes over the aquifer. The economic internal rate of return (EIRR) for these investments was 25%. For the investments in San José Pinula, whose waters discharge into the Teocinte reservoir that supplies water to the Santa Lucia water plant, the benefit is in the form of savings on the cost of treating that drinking water, with an IRR of 20%.
- 5.14 The IRR for the works at San Miguel Petapa is well below their true return, since the investments include a catchment system as well as

sewer mains and water treatment. However, the only benefits considered were those that reduced contamination of the Ojo de Agua aquifer will generate as a result of sewage treatment. The benefits accruing from installation of residential sewers (to replace the septic tanks installed in a large percentage of the present households) were not included in the analysis because the data needed to quantify them were not available.

- 5.15 In the case of septic tanks, the low IRR is due to the high unit costs of installing them in slum areas. The benefits are in the form of the pollution avoided downstream from the drains and are proportional to the relatively small volume of water treated from the septic tanks. Despite these results, it was decided to keep these works in the project since in the long run the solution to the water pollution problem will have to be thorough if it is to be at all effective. In our analysis, the benefits were distributed in linear fashion among the various investments, according to the volume of water treated by each. However, this is only an estimate. Strictly speaking, to determine the return rate, the various works have to be regarded as part of a combined investment to protect the Ojo de Agua aquifer, since it would still be contaminated if only one major source of sewage went untreated. The combined return from the works that concern the Ojo de Agua aquifer is therefore satisfactory.

D. Benefits and distributional impact

- 5.16 The principal benefits expected from this program are mainly environmental in nature. The solid waste component will reduce air pollution (from the bad odors and smoke from the dumps) and the health and well-being problems associated with the proliferation of rats, flies and other vectors and with water pollution from refuse and untreated leachates. The green spaces component will cut down on erosion in the ravines and on the Cerro Alux. It will create new green spaces that provide recreation, discourage squatting, and make it easier for rainwater to filter into the underground aquifers in the urban area. The sewage treatment projects will reduce contamination of surface waters and aquifers, and will thus have indirect effects on the health of the population.
- 5.17 The three investment components of this project will benefit the entire population of the GCMA. However, their main target will be the low-income population. The effect of the garbage dumps in their present form is worse for those who live nearby; the closer the family home to the dump, the poorer the family is likely to be. The poor are virtually bypassed by the existing refuse collection service, because of the rates charged and because of the transportation problems in outlying neighborhoods.
- 5.18 Something similar happens in the case of the green spaces. The poorest people live in or near the ravines. They have virtually no access to green spaces outside the urban perimeter for recreation.

- 5.19 The poor stand to gain the most if the quality of the waters available in the GCMA is preserved by treating sewage, because as a rule the low-income population is more susceptible to diseases caused by contaminated water.

E. Institutional viability

- 5.20 The measures proposed under the solid waste and green spaces components rely on the involvement of private agents to operate and maintain the services. EMPAGUA will operate and maintain the sewage treatment works.
- 5.21 In the case of solid waste, private operators will be hired to operate the treatment sites and will be required to comply with the rules established in their respective contracts for receiving the solid waste, processing it and disposing of it. Private entrepreneurs will also be hired for solid waste collection. To ensure that the trucks are properly maintained, a procedure will have to be devised to transfer the collection vehicles to the respective operators.
- 5.22 For the green spaces component, private entrepreneurs will be contracted for the reforestation work and will have the option of either purchasing their seedlings from the municipal nurseries or from private suppliers. An effort will be made to hire workers from the neighboring communities, in order to encourage an interest in protecting the replanted areas.

F. Financial viability

- 5.23 The proceeds from the fees proposed for refuse collection and protection of green spaces will cover the total costs of both program components. Those fees, which will be charged on the electricity bill, would be far below the levels considered acceptable by the public, judging by the averages obtained with the WTP surveys. An average monthly fee of Q21 per electric connection (the fees for refuse collection and green spaces would be charged on the electricity bill) will recover the cost of collecting and processing the refuse, including depreciation of the investments and service of the debt with the Bank. In the case of the green spaces, costs can be recovered and debt service paid with an average monthly fee of just Q1.
- 5.24 In the case of sewage, EMPAGUA will cover the full cost of the plants in the program, including depreciation, debt service, and the operation and maintenance costs. The 20% that EMPAGUA charges all users for sewerage when it bills for water will act as a cost recovery mechanism. EMPAGUA also plans to charge users served by other water supply systems for the sewerage service provided.
- 5.25 A preliminary study has found that for the refuse collection service, if monthly rates range from Q1 to Q80 for residential

users and Q200 to Q500 for commercial and industrial users, the average monthly fee would be around Q29.50, well above the minimum required for financial viability (Q21 a month). There is considerable room, then, to devise a rate structure commensurate with customer income. (See Annex V-2 on the financial viability analysis.) The rate scales will be determined as part of the final designs of the investments in solid waste and green spaces components (Annex II-6).

G. Community participation

- 5.26 The success of the projects proposed for the green spaces component depends on community participation. The people who live near the green spaces, particularly people in the ravines, have shown an enormous interest in the possible reforestation of those lands, especially because of the prospect of added safety in their community, a more attractive environment and control of landslides. Property owners on the Cerro Alux would be very happy to receive help to discourage the cutting of firewood by unauthorized outsiders. The community will participate in the program on several levels: as the targets of the environmental education and forestry extension measures; as individuals spreading knowledge about forest production and the environment, through the workers from the community; and as employees of the reforestation activities.

H. Women's participation

- 5.27 The program's impact will be greater among women, since the benefits are targeted at the home, where the woman is the main person in charge of hygiene, health, food and recreation. Hence, the training and environmental education consulting services will emphasize the gender perspective.

I. The program's risks and the mechanisms to minimize them

- 5.28 Any investment runs the risk of not generating sufficient returns to cover the financial obligations undertaken. The avenue selected to deal with this risk is to establish realistic and innovative cost-recovery and loan-repayment mechanisms. On the outside chance that those mechanisms fail, there are two backups: the financial backing of the Municipality of Guatemala City and, as a last resort, the central government's guarantee, in keeping with the Bank's established standards.
- 5.29 The solid waste component could run into problems if the owners of the properties adjacent to the new landfills and/or the owners of the trucks that now pick up the refuse feel that their interests are being adversely affected by this component. To minimize these risks, surveys have been done in the communities, and a process is under way to circulate information about the project before it starts. Also, the recommendations received during those surveys

have been added to the TORs in the final designs and the associations to which the owners of garbage trucks belong will be invited to bid on the solid waste transport contracts. Provision has also been made to include those unions in the training activities planned under the **institutional reform and development component**.

- 5.30 The greatest risk for the **green spaces component** is that the newly planted trees will be destroyed either by vandals or by people cutting firewood. To minimize this risk, an effort will be made to hire labor from among the people living nearby and thus instill in them a sense of ownership vis-à-vis the plantings. Through formal and informal environmental education, the public will be sensitized to the need to preserve the vegetation in the ravines.
- 5.31 The main risk for the investments in sewage treatment is that EMPAGUA will not live up to its commitment to operate and maintain the infrastructure for this service. If the company has financial difficulties, the first expenditures to be cut will be sewage treatment, not the water supply service. To minimize this risk, the company will be required to undertake institution-strengthening measures to guarantee efficient operations. These measures will be introduced as part of the **institutional reform and development component**. At the same time, rate adjustments will be introduced for the water supply services, and people who use only sewerage will be charged. The fees will be set with a view to recovering 100% of EMPAGUA's operating, maintenance and investment costs.

**PERFORMANCE INDICATORS AND GOALS TO BE EVALUATED
DURING THE PROGRAM**

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
GOAL: A sustainable improvement in the quality of life and environmental surroundings of the people in MGC.	- The bad odors and flies and rats that proliferate when refuse is improperly managed will be reduced.		20%	50%	75%	90%
	- The ratio of pollutants of household origin (MPN fecal coliform bacteria and BOD) per capita will be down in Lake Amatitlán and the Villa Lobos River.		20%	50%	75%	95%
	- Green spaces will increase.		15%	25%	35%	50%
PURPOSE: Proper management of refuse, sewage and green spaces and modernization of metropolitan and municipal environmental management with private sector participation.	- Household refuse is collected and disposed of properly.			60%	75%	95%
	- Refuse from public areas, businesses, industry and health facilities is collected and disposed of properly.		30%	60%	80%	100%
	- More poor people have sewage treatment.		10%	15%	20%	30%
	- Deforestation on the Cerro Alux is reversed.		30%	60%	80%	100%
	- The ratio of green space per capita increases.	4m ²	5m ²	6m ²	7m ²	8m ²
	- Contracts are let to the private sector for final refuse disposal.		One contract to operate one landfill	Two contracts to operate two landfills		
	- Contracts are let to the private sector for refuse collection.		Two refuse collection contracts.	Two refuse collection contracts.		
	- The municipalities' income increases.			10%	20%	30%
	- EMPAGUA's income increases.		10%	20%	30%	40%

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
SOLID WASTE COMPONENT	- The Zone 3 landfill is improved.		40%	60%		
	- Two sites are prepared to serve as landfills.		1	1		
SEWAGE COMPONENT	- Septic tanks are installed.		64			
	- Treatment plants are reconditioned.		7			
	- The San Miguel Petapa and San José Pinula sewerage and treatment system is built.			1	1	
GREEN SPACES COMPONENT	- Ravines are replanted.		176 HA	150 HA	150 HA	100 HA
	- 17 urban parks are beautified.		4	4	5	4
	- Community action is developed.	100,000 people	100,000 people	100,000 people	100,000 people	100,000 people
	- The municipal nurseries are able to produce more plants.	500,000 plants				
INSTITUTIONAL REFORM AND STRENGTHENING COMPONENT	- EMPAGUA is restructured and modernized.		25%	25%	50%	
	- The municipalities' administrative/financial systems function adequately.		1	2	2	
	- The municipalities' cadastral systems have been developed and implemented.		2	2	2	

LOGICAL FRAMEWORK OF THE SOLID WASTE COMPONENT

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>le improvement in the quality of the environment of the people of the GCMA.</p>	<ul style="list-style-type: none"> - The bad odors and proliferation of flies and rats are brought under control in the GCMA as of 1998. - By 1999, 80% of the population can claim to have attractive green spaces within 1/2 hour of their home. - The ratio of pollutants of household origin (MPN fecal coliform and BOD) per capita in Lake Amatitlán and the Villalobos River is down. 	<ul style="list-style-type: none"> - An annual survey in the GCMA of public satisfaction with solid waste collection and disposal services, sewerage and sewage treatment services, and access to green spaces. - Annual records of water quality in Lake Amatitlán and the Villalobos River. 	
<p>solid waste generated in the GCMA is disposed of in an environmentally acceptable way.</p>	<ul style="list-style-type: none"> - As of 1997, the household solid waste of over 90% of the GCMA population is collected and disposed of. - As of 1997, 100% of the solid waste from public areas, from businesses and industry and from health facilities is collected and disposed of. 	<ul style="list-style-type: none"> - An annual survey among users about the service. - Patrolling one day each month to determine whether refuse is being dumped at clandestine refuse sites. 	<ul style="list-style-type: none"> - Green spaces and sewerage components fulfill the goals. - Municipalities clean up dump sites within their jurisdiction.
<p>COMPONENTS:</p> <p>1. El Trébol is equipped for final solid waste collection in the GCMA, in keeping with standards and timetables.</p> <p>2. Villanueva is equipped for final solid waste collection in the GCMA, in keeping with standards and timetables.</p>	<ol style="list-style-type: none"> 1. As of 1998, El Trébol is receiving the planned amount of solid waste; by 1999, the facility is sorting the solid waste and making compost; the leftover waste is disposed of properly and the leachates are treated starting in 1998. 2. As of 1999, Villanueva is receiving the planned volumes of solid waste; sorting and compost production begin in the year 2000; the leftover waste is disposed of properly and leachates are treated starting in 1999. 	<ul style="list-style-type: none"> - Records showing the weight of the solid waste received, the recycling at the sorting facility and the compost being produced and sold at the three sites. - Monthly inspection reports to check that environmental standards are being observed in the solid waste disposal activities at the three sites. 	<ul style="list-style-type: none"> - The Municipality lets private businesses do the solid waste collection to private businesses. - The users are paying the collection fees charged on their electric power bill.

LOGICAL FRAMEWORK OF THE GREEN SPACES COMPONENT

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTION
the environment for the e GCMA.			
people of the GCMA that meet the necessary for well-being.	<ul style="list-style-type: none"> - More than 8 m² of green spaces per inhabitant are available as of 1999. - Squatting in the six ravines is brought to a halt as of 1997. - Erosion-caused landslides in the six replanted ravines gradually decline and stop altogether by 2005. - Deforestation on Cerro Alux is reversed. 	Annual report assessing the situation in the ravines, in the parks and on Cerro Alux, submitted by the Municipality.	<ul style="list-style-type: none"> - Solid waste and sewage c accomplish the planned o
ONENTS: es in the GCMA according to a reen spaces are tended y to specifications. lux is protected.	<ol style="list-style-type: none"> 1. By 1999, 600 hectares of ravines are replanted with trees native to the area. 2. As of 1997, plant cover in the urban parks is being maintained. 3. By 1999, more than 95% of Cerro Alux has been replanted with vegetation indigenous to the area. 	Annual report assessing the situation in the ravines, in the parks and on Cerro Alux, submitted by the Municipality.	<ul style="list-style-type: none"> - The people who live in th work together to prevent replanted areas. - Users pay the fee charged electric bill to have green preserved. - The Municipality provide guard Cerro Alux.

LOGICAL FRAMEWORK OF THE SEWAGE COMPONENT

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTION
the environment for the e GCMA.			
e gradually the sewage- tion and contamination water and groundwater A.	According to a timetable established by the Municipality, more and more of the GCMA's population has sewage treatment.	Progress reports to be submitted by EMPAGUA.	- Solid waste and green sp components accomplish th objectives.
ONENTS: wage treatment plants oned and operating by reatment for five slums al areas in the southern 1998. d treatment system for uel Petapa in operation d treatment system for Pinula in operation as	<ol style="list-style-type: none"> 1. Primary and secondary treatment of sewage with a total capacity of over 15,000m³/day in operation at the seven plants. 2. Primary and secondary treatment of sewage in septic tanks installed, with a total capacity of over 4,000 m³/day. 3. Sewers and primary and secondary treatment of sewage for the San Miguel Petapa area in operation, with a capacity of 7,000 m³/day. 4. Sewers and primary and secondary treatment of sewage for the San José Pinula area in operation, with a capacity of 12,000 m³/day. 	Monthly inspection reports, where the volume and quality of the treated water are measured by services contracted by the Environmental Management Unit.	- EMPAGUA is institution and its proceeds from tax increase to cover disburse (financial viability). In 1999 EMPAGUA und sewage-treatment investm for the entire GCMA.

LOGICAL FRAMEWORK OF THE INSTITUTIONAL REFORM AND STRENGTHENING COMPONENT

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTION
the environment for the GCMA.	Metropolitan management institutions are created and function properly.	Minutes of the meetings of the Council of Mayors.	The Municipalities' participation
the metropolitan and environmental with private sector	<ul style="list-style-type: none"> - The Council of Mayors is created and installed. - The environmental authority is installed and operating. - EMPAGUA is restructured. - Contracts for environmental public services are let to the private sector. 	<ul style="list-style-type: none"> - Charter agreement signed. - PEU report. - The deficit down by 30% - Contracts concluded between the municipalities and the private sector. 	<ul style="list-style-type: none"> - The Municipalities' support participation - Private sector interest in environmental public services
<p>OBJECTIVES:</p> <p>creation of environmental services</p> <p>creation of municipal environment</p> <p>capacity for environmental monitoring and management.</p>	<ul style="list-style-type: none"> - The new solid waste management system is operating by the second year. - The EMPAGUA restructuring process is completed in the second year. - The municipalities are instructed in how to contract with the private sector. - The financial/administrative systems are functioning properly. - The municipal cadastres are prepared. - The solid waste management code is approved. - The monitoring plan is approved. 	<p>PEU report.</p> <p>PEU report</p> <p>PEU report</p> <p>PEU report</p> <p>PEU report</p>	<ul style="list-style-type: none"> - The public and the solid waste collectors accept the new system. - The ATN/SF/CI-5112-GU successfully carried out. - The municipal modernization continues. - The environmental authority is established and functioning.

TIMETABLE FOR PROCUREMENT OF GOODS AND SERVICES

Category	Financing	Method	Pre-qualification	Date
1. Consulting services				
a. Final designs — solid waste component 3 packages/US\$186,919	IDB (100%)	CN	No	June 97
b. Final designs — sewage component 3 packages/US\$198,854.33	IDB (100%)	CN	No	June 97
c. Final designs — green spaces component US\$159,467	IDB (100%)	CN	No	June 97
d. Advisory services and works supervision US\$800,000	IDB (100%)	CPI	Yes	June 97
e. Promotional campaign US\$30,000	Local (100%)	I	No	December 97
f. Training for solid waste collectors US\$36,000	IDB (100%)	I	No	December 97
g. Institutional reform — EMPAGUA US\$107,040	IDB (100%)	CN	No	July 97
h. Administrative and financial matters US\$289,260	IDB (100%)	CPI	Yes	December 97
i. Concessions — private sector US\$107,040	IDB (100%)	CN	No	June 97
j. Urban cadastre US\$2,000,000	IDB (100%)	CPI	Yes	October 97
k. Monitoring US\$300,000	IDB (100%)	CPI	Yes	December 99
l. Industrial pollution study US\$150,000	IDB (100%)	CN	No	June 97
m. Solid waste contingency plan US\$100,000	IDB (95%)	CN	No	April 97
n. Additional EIAs US\$150,000	IDB (100%)	CN	No	July 97
2. Purchase of equipment				
a. Equipment — sorting units US\$3,160,361	IDB (100%)	CPI	Yes	April 98
b. Solid waste collection vehicles US\$10,483,740	IDB (100%)	CPI	Yes	April 98
c. Equipment — treatment plants 3 packages/US\$497,135.67 each	IDB (100%)	CPI	Yes	January 98
d. Equipment — green spaces US\$234,738	IDB (100%)	CN	No	July 98
e. Equipment — protected areas US\$125,880	IDB (100%)	CN	No	July 98
f. Equipment — institutional strengthening US\$374,500	IDB (100%)	CPI	Yes	December 97
g. Meteorological stations US\$60,000	IDB (100%)	CN	No	July 98
3. Civil works				
a. Civil works — treatment plants US\$4,474,220	IDB (100%)	CPI	Yes	January 98
b. Sanitary landfill infrastructure US\$885,000 each	IDB (100%)	CN	No	July 98

CN local call for offers
CPI international open call for offers
I invitation

PROPOSED RESOLUTION

GUATEMALA. LOAN ____/OC-GU TO THE MUNICIPALIDAD DE
LA CIUDAD DE GUATEMALA
(Environmental Program for the Metropolitan Area of Guatemala)

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 Municipalidad de la Ciudad de Guatemala, as Borrower, and the República de Guatemala, as Guarantor, for the purpose of granting the former a financing to cooperate in the execution of an Environmental Program for the Metropolitan Area of Guatemala. Such financing will be for the amount of up to thirty-four million eight hundred thousand dollars of the United States of America (US\$34,800,000) from the Single Currency Facility of the Ordinary Capital resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.

RGII-GU044P
GU-0073
Original: Spanish

PROPOSED RESOLUTION

GUATEMALA. PARTIAL PAYMENT OF INTEREST ON LOAN No. ____/OC-GU
TO THE MUNICIPALIDAD DE LA CIUDAD DE GUATEMALA
(Environmental Program for the Metropolitan Area of Guatemala)

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 as administrator of the Intermediate Financing Facility Account, hereinafter referred to as the "account", to enter into such contract or contracts as may be necessary with the Municipalidad de la Ciudad de Guatemala, as Borrower, and the República de Guatemala, as Guarantor, and to adopt other pertinent measures to use the resources of the account to pay a part of the interest due by the Borrower on outstanding balances of the loan authorized in the Resolution DE- / , in accordance with the provisions set forth in Document FN-263-2, as amended, approved by the Board of Executive Directors on December 21, 1983.