

PERU  
LIMA TRANSPORT

## GEF Project Document

Latin America and Caribbean Region  
LCSFT

<p><b>Date:</b> October 29, 2003  <b>Sector Manager/Director:</b> Danny M. Leipziger  <b>Country Manager/Director:</b> Marcelo Giugale  <b>Project ID:</b> P035740  <b>Lending Instrument:</b> Specific Investment Loan (SIL)</p>	<p><b>Team Leader:</b> Paulus A. Guitink  <b>Sector(s):</b> General transportation sector (70%),  Sub-national government administration (30%)  <b>Theme(s):</b> Administrative and civil service reform (P),  Access to urban services for the poor (P), Pollution  management and environmental health (S), Environmental  policies and institutions (S), Other social protection and risk  management (S)</p>
---	--

<p><b>Global Supplemental ID:</b> P074021  <b>Sector Manager/Director:</b> Danny M. Leipziger  <b>Lending Instrument:</b> Specific Investment Loan (SIL)  <b>Focal Area:</b> C - Climate change  <b>Supplement Fully Blended?</b> Yes</p>	<p><b>Team Leader:</b> Pierre Graftieaux  <b>Sector(s):</b> General transportation sector (70%),  Sub-national government administration (30%)  <b>Theme(s):</b> Access to urban services for the poor (P) ,  Other urban development (P), Gender (S), Pollution  management and environmental health (S), Regulation and  competition policy (S)</p>
---	---

### Project Financing Data

Loan     Credit     Grant     Guarantee     Other:

**For Loans/Credits/Others:**

**Amount (US\$m):** 45.00

**Borrower Rationale for Choice of Loan Terms Available on File:**  Yes

**Proposed Terms (IBRD):** Fixed-Spread Loan (FSL)

**Commitment fee:** 0.85% (first 4 years), 0.75% afterwards

**Front end fee (FEF) on Bank loan:** 1.00%

**Initial choice of Interest-rate basis:**

**Type of repayment schedule:**

Fixed at Commitment, with the following repayment method (choose one):

Linked to Disbursement

Financing Plan (US\$m):	Source	Local	Foreign	Total
BORROWER/RECIPIENT		44.40	0.00	44.40
IBRD		0.00	45.00	45.00
INTER-AMERICAN DEVELOPMENT BANK		0.00	45.00	45.00
GLOBAL ENVIRONMENT FACILITY		7.93	0.00	7.93
<b>Total:</b>		52.33	90.00	142.33

**Borrower/Recipient:** GOVERNMENT OF PERU

Municipality of Metropolitan Lima (MML)

**Responsible agency:** PROTRANSPORTE LIMA

Address: Avenida Aramburu No. 166 - 5, Miraflores, Lima

Contact Person: Julio Pflucker, Executive Director

Tel: 51 1 421 7473

Fax: 51 1 421 8512

Email: Jpflucke@Protransporte.org.pe

**Other Agency(ies):**

FONAM (Fondo Nacional del Ambiente), implementation unit for the GEF project

Address: Calle Hermanos Quinteros 103.

Urb. La Castellana Surco. Lima 33.

Contact Person: Alberto Gonzales Director Ejecutivo, FONAM

Tel: 51 1 449-6200

Fax: 51 1 449-6200

Email: agonzales@fonamperu.org

**P035740 Estimated Disbursements ( Bank FY/US\$m):**

FY	2004	2005	2006	2007	2008				
Annual	2.23	11.00	13.86	13.45	4.46				
Cumulative	2.23	13.23	27.09	40.54	45.00				

**P074021 (GEF) Estimated Disbursements ( Bank FY/US\$m):**

FY	2004	2005	2006	2007	2008				
Annual	3.18	2.51	1.48	0.55	0.21				
Cumulative	3.18	5.69	7.17	7.72	7.93				

**Project implementation period:** 5 years (2003-2008)

**Expected effectiveness date:** 04/30/2004 **Expected closing date:** 06/30/2009

## **A. Project Development Objective**

### **1. Project development objective: (see Annex 1)**

The main objective of the project is to assist the Municipality of Metropolitan Lima (MML) in enhancing the economic productivity and the quality of life within the Lima Metropolitan area through improving mobility and accessibility for the metropolitan population, especially in the peri-urban poor neighborhoods by establishing an efficient, reliable, cleaner and safer mass rapid transit system. The project forms the first phase of an integrated mass rapid transport system in Lima using high capacity buses on exclusive, separated corridors with designated bus-stops and terminals, as well as a feeder bus route and bicycle network. The first phase provides services from Lima's historic center to the northern and southern cones of Lima with a population of approximately 3.5 million, of which 60% have per capita incomes of less than US\$75 per month.

The specific project development objectives are to: (i) implement the new mass rapid transit system on the basis of a Public Private Partnership (PPP) with concessioned buscorridor/feeder routes operations and fare collection system; (ii) improve access within low income areas through facilitating the use of low cost transport alternatives, such as bicycles and walking; (iii) strengthen the local institutional capacity to regulate and manage the metropolitan transport system on a sustainable basis; and (iv) reduce the negative environmental impact of motorized transport in Lima.

To achieve its main objective, the project will implement (i) physical measures to rehabilitate and improve the existing road infrastructure, with emphasis on rehabilitation/construction of segregated bus corridors, feeder bus roads, bicycle paths and pedestrian facilities; (ii) traffic management measures to enhance transport and environmental conditions including road safety improvements, transport emission reductions and better access for vulnerable road users such as pedestrians, bicyclists and mobility constrained persons; and (iii) institutional measures to strengthen the Municipality of Lima's planning, regulatory, administrative and operational capacity in urban transport in the medium and long term. Supported by the GEF grant, the project also aims at reducing the current oversupply in public transport which is generating (i) large inefficiencies in public transport provision; (ii) urban congestion and adverse environmental and safety impacts; (iii) irrational and inefficient use of scarce road space; (iv) predatory and counterproductive competition; and (v) low average speeds and long travel times.

To facilitate and support successful implementation of the project components, the project will also assist the Municipality in designing and implementing a comprehensive public transport policy framework, which not only includes the restructuring of the public bus system, but also will provide the legal and regulatory basis for other public transport operations, such as taxis, colectivos and mototaxis.

### **2. Global objective: (see Annex 1)**

The parallel GEF funds will help facilitate greenhouse gases reduction from ground transport in the Metropolitan Area of Lima-Callao through contributing to the promotion of a long-term modal shift to more efficient and less polluting forms of transport, such as non-motorized transport and high-capacity public transport vehicles operated on segregated busways. The project GEF specific objectives are: (i) rationalization of public transport capacity by providing financial incentives (Credit Guarantee Fund) to retire old buses; (ii) rehabilitation and expansion of the existing bikeway network in Lima and Callao and promotion of bike use; (iii) delivery of an institutional strengthening program on sustainable transport, targeting municipalities and institutions dealing with environmental issues and/or transport planning; and (iv) to assess and monitor the GEF project global consequences. In addition to GHG, the transport sector

contributes to the emission of air pollutants like SO<sub>x</sub>, CO, PM<sub>2.5</sub> and NO<sub>x</sub>. NO<sub>x</sub> together with VOCs lead to the formation of smog or tropospheric ozone (O<sub>3</sub>). SO<sub>x</sub> and NO<sub>x</sub> contribute indirectly to ambient PM<sub>2.5</sub>. Reductions in vehicle-km will reduce emissions of urban air pollutants and reductions in fuel-use per passenger km will significantly reduce emissions of urban air pollutants from uncontrolled or poorly controlled vehicles, as are the majority of public transport units.

### **3. Key performance indicators:** (see Annex 1)

To ascertain whether or not the project has achieved its development objectives, the following indicators would have to be achieved (more specific performance indicators are included in Annex 1, Project Design Summary):

#### **Lima Transport IBRD/IDB loan**

- Creation of an efficient segregated bus corridor system for Metropolitan Lima with a length of 28.6 km., 2 end terminals with workshops, 2 midway terminals and 35 bus-stops
- Improved quality of 50 km of feeder (access) roads to the bus corridor system.
- Improved level of comfort for passengers, to be monitored by biannual scorecards (see section E.6).
- Reduced average travel times for low-income commuters using public transport in the area of influence of the mass rapid transit system (in hours/person/day).
- Reduction of operating costs in traffic corridors (in soles/bus-km or preferably soles/passenger-km).
- Improvement of the bus system energy-efficiency (in liters of diesel per bus-km or preferably passenger-km).
- Reduced road accident rate in the area of influence of the segregated bus corridors.
- Integrated feeder-trunk tariff structure at level competitive with existing services.
- Introduction of public transport emission standards and regular public transport vehicles inspections.
- Improved air quality in the areas served by the project.
- Strengthening and expansion of existing air quality monitoring mechanism.
- Improved accessibility for poor and very poor households and vulnerable road users (e.g. women, mobility constrained and elderly people) to job opportunities, social services, etc.
- Effective traffic management and enforcement measures planned and designed by MML.

## **GEF Grant**

- Public policies incorporate themes of air pollution reduction by influencing on policy decision makers, strengthening government technical teams on air pollution and sustainable transport issues, and establishing alliances with the civil society.
- Establish modes of surveillance and monitoring to measure the effectiveness and facilitate the dissemination of the project.
- Reduction in life-cycle GHG emissions from the transport sector compared with the baseline.

More specifically:

### ***On the public transport capacity rationalization component:***

- At least one Lima Transport concessionaire has used the Credit Guarantee Fund option
- At least 250 aged and polluting public transport vehicles retired by the 4th year of project implementation through the Guarantee Fund.
- At least 50% of bus operators displaced through the Credit Guarantee Fund arrangement have been retrained and have received technical and economic support to opt for new employments or new business outside the transport sector.

### ***On the non-motorized transport (NMT) component***

- 32.5 kms of bikeways rehabilitated in 12 months
- 6.1 kms of bikeways extension to connect Lima's two main universities, built in 12 months
- Doubling of the number of trips in bicycle triples in the area of influence of the projects pilot in comparison to the base line
- Adoption of bicycle-use policies at the municipal and central government level.

### ***On the Institutional Strengthening Component:***

- 11 local governments and FONAM have strengthened their capacities (training of human resources, technical assistance and equipment received)
- 500 people among local authorities, civil servants, community leaders, civil society groups and general population are informed about sustainable transport options and their effect on air quality, GHG emissions and the environment in general

## **B. Strategic Context**

### **1. Sector-related Country Assistance Strategy (CAS) goal supported by the project: (see Annex 1)** **Document number:** 24205-PE **Date of latest CAS discussion:** September 17, 2002

The Country Assistance Strategy report for Peru, dated August 19, 2002, spells out the priorities of the President Toledo's administration to attack poverty: competitiveness and employment generation, access to health, education, culture and basic services; and creation of a public administration that serves the people. The CAS continues an emphasis on sector institutional reform and demand-driven poverty reduction programs. The Bank will assist the government to achieve these goals making safety nets more efficient and creating growth opportunities that target the poor, and will strengthen governance and institutions.

The proposed Lima Transport Project will strongly support these objectives by addressing barriers for economic and social development of the poor in an area with 3.5 million people or 15% of Peru's total population in the peri-urban neighborhoods of Metropolitan Lima. The approximately 28 km network of segregated bus corridors to be constructed under the project would lead to an improved level of service for passengers from the peri-urban neighborhoods with the highest incidence of poverty by reducing travel times, bus operating costs, and especially for longer trips, transport expenditures. Through the improvement of feeder routes, sidewalks and bicycle paths the project would also benefit intra-district short trips.

The proposed project would also support the strengthening of the Municipality of Lima and rationalization and control of public transport routes through technical assistance to PROTRANSPORTE and the Dirección Municipal de Transporte Urbano (DMTU), entities actually involved in the preparation and design of the project. These agencies will play a key role in implementing the project, formulating a medium/long-term urban transport strategy for Lima, regulating public transport operations, restructuring existing route licenses and facilitating segregated corridor route concessions to private operators. The resulting improved public transport management is expected to reduce traffic congestion and traffic accidents, and mitigate the negative environmental impact of vehicle emissions, including greenhouse gas emissions (GHG).

Additionally, as part of a comprehensive program to improve transport conditions in Lima, the proposed project aims to: build transfer stations or terminals, one at each end of the segregated corridor and two intermediate ones; improve and rehabilitate street paving in low-income areas to facilitate (feeder) bus access (50 km of feeder roads); build sidewalks and bicycle paths to improve accessibility to the COSAC ("corredores de alta capacidad" or "high capacity corridors") system; improve traffic management by installing new traffic signals and horizontal and vertical road markings along the bus corridors; and to improve the quality of bus services through the gradual renovation of the current bus fleet within the urban transport system.

#### **1a. Global Operational strategy/Program objective addressed by the project:**

The proposed GEF component is consistent with the objectives of the GEF Operational Program 11 on Transport, which states that "GEF will facilitate commitments to adopt sustainable low-GHG transport measures and disengagement from present unsustainable measures" and "facilitate modal shifts from personal transport to mass transit" and non motorized modes.

## **2. Main sector issues and Government strategy:**

### **Urban Public Transport Sector Reforms in Metropolitan Lima since 1980.**

#### **■ The 1980s: An Overly Regulated Period**

The migratory processes and the intense industrial centralization trend, along with rapid urbanization, contributed to the growth of the city of Lima, which in 1981 reached 4.6 million out of 17 million in Peru. The completely regulated urban transport services in Lima, in the 1980s were scarce, slow, unreliable, insecure and very badly maintained. Service was provided by large publicly owned omnibuses (80 to 100 passengers), private (micro)buses (20 to 100 passengers), colectivos (large cars that accommodate five or six passengers) and taxis. While publicly owned buses had fixed stops along well-defined routes, private (micro)buses stopped at will trying to accommodate the needs of the boarding/alighting passengers.

In July 1980, the registered fleet of vehicles counted 1,574 buses, 7,101 microbuses, 560 collectives and 718 taxis, plus an unknown number of private cars (estimated to be higher than that of registered units) that also operated as taxis. In 1985, public transportation accounted for 74% of motorized trips, with an average of six million trips daily, of which 4.4 million (three out of every four trips) were served by public transportation. The modal share of public transport even rose to an impressive 89% of motorized trips in the early 1990s.

The largest buses belonged to the largest state-owned bus firm, ENATRU, which operated more than 600 units with a single driver-fare collector. These buses were generally in better condition than the other types of units. Most of the microbuses were small units, and more than 70% had 26 seats or less. They also tended to be older vehicles: 35% were more than 15 years old. The physical condition of these units was inadequate. Taxis also played an important role in public transportation and taxi tariffs were negotiable, as the cars were not equipped with meters. In terms of service, several slums (*"pueblos jóvenes"*) in the periphery Metropolitan Lima were not served by public transportation, forcing users to use mototaxis or to walk considerable distances to board the buses.

Urban transport routes were conceived in terms of connecting the slums with the economic centers where most formal employment was located (businesses, industrial district), rather than connecting these residential areas to the places where services (health, education, etc.) were provided.

#### **■ The 1990s: Deregulation and New Challenges**

In the 1990s, the Lima-Callao metropolitan area further consolidated its status as the critical hub of Peru's economic, political and social life. It currently concentrates about one third of the country's total population (about 7,700,000), half of the national production, and 68% of the motorized vehicles.

The trade liberalization and economic recovery measures adopted in 1992-93 brought about a shift towards privatization and deregulation of the transport sector. This change, along with the lifting of the imports ban (which limited new vehicles imports) and the massive layoff of public sector workers, caused mixed results in the provision and quality of public transport services.

Between 1990 and 1999, the number of motorized vehicles in the city doubled, and the trips in public transport units decreased from 89% to 81%. Still, more than nine million trips were made daily using motorized vehicles in Lima, of which 80% were made using public transportation. However, as a result of deregulation 98% of the public transport vehicles were independently owned and operated, at a ratio of 1.25 vehicles per owner.

In a parallel fashion, the number of units dedicated to provision of taxi service jumped from 10,000 to approximately 150,000 cars and an increasing number of moto-taxis, most of which offer this service informally, and are not registered or licensed in any way. From the perspective of the user, the de-regulation of public transport has been perceived as an improvement in terms of public transport service frequency and access. Whereas in the 80s and early 90s large crowds of people were observed at the bus stops, the increase in supply caused waiting times to be reduced to 5-8 minutes. Almost all destinations are now within 500 meters of a bus service, and more than 80% of passengers reach their final destination without transferring. Most of the large buses of the past have been replaced by small minivans (“*combis*”) which have small capacity, drive over the speed limits, provide low quality service in terms of comfort, and lack periodical vehicle maintenance due to reduced or limited profitability. ENATRU no longer exist as a single company, and its large units were sold to individuals and transport micro-enterprises that now operate independently.

Finally, the peri-urban slums of Metropolitan Lima that were previously disconnected from the network of public transportation were now served but with severe limitations in terms of reliability, personal security and road safety. Most of these these slums are now large suburban areas, some of them with populations of over one million people, requiring an adequate and efficient urban transport system.

#### ■ **Restructuring of urban transport sector in Metropolitan Lima.**

The population of Metropolitan Lima is expected to approach 8 million by 2004, but with approximately 110 inhabitants per ha. population density is low (Bogotá 200p/ha). It is the fifth largest metropolis in Latin America, and although the average yearly income is approximately US\$2,200 per capita, more than half of Lima’s population is considered poor. Most of Lima’s poor live in the periphery of the city - either in the northern or southern 'cones', and one of their major concerns is the lack of access to job opportunities and centers of economic and social activity.

In Lima, the number of cars, which had remained stable through most of the 1980's at about 270,000, increased to about 1,000,000 by 2002. Over the last ten years, the number of public transport vehicles has increased from 10,500 units to an estimated fleet of over 60,000 units with an average age of 16 years – many exceeding 25 years – making Lima’s public transport fleet the oldest in Latin America. All motorized urban transport in Lima metropolitan area is by road with presently private cars covering 20% and public transport covering 80% of the total motorized trips, reflecting a decrease in public transport compared to 1990 when it was 89%. In addition, about one third of total daily trips is made on foot, primarily by the poor. Public transport is privately owned and includes buses, combis (12-passenger buses), coasters (approx. 35-passenger), micros, taxis, colectivos and moto-taxis and is operated in a deregulated environment. Together with private cars and buses, approximately 190,000 formal and informal taxis and 45,000 mototaxis cause high congestion, air and noise pollution levels which rank amongst the highest in the region, high numbers of traffic accidents and high operating costs. Recent studies sponsored by the World Bank indicate that an estimated US\$500 million are lost every year in man-hours and operational costs due to congestion and inefficiencies of the urban transport system. Over-combustion of 13.2 million liters of gasoline and over-emission of 1,000 metric tons of air pollutants by an obsolete fleet are a constant health threat and a large source of GHG emissions. With over 70% of the national vehicle fleet concentrated in the Lima Metropolitan Area, the binomial oversupply-congestion prompts an excessive import of vehicle fuels, contributing significantly to the commercial balance deficit (*Municipalidad Metropolitana de Lima: Anteproyecto del Plan de Acción Municipal 2003*).



The afore described urban transport growth patterns are not sustainable and require a restructuring of the urban transport sector: average travel times and public transport expenditures are high with no reliable transport alternative for poor urban commuters who are concentrated on the periphery of Lima metropolitan area. Because of congestion, the average round-trip travel time to work for the poor urban worker is often between 1.5 to three hours a day. In addition, the quality of the services provided is low - vehicles are poorly maintained and drivers poorly trained -, personal safety/security of public transport is a major concern - especially for women -, and access to buses for mobility constrained persons is, at best, limited. The worsening of the quality of the public transport service is also a matter of a weak institutional framework and poor governance, which contribute significantly to infrastructure deficiencies. These limitations have generated the deterioration of accessibility and mobility, which affect commuters in different ways, especially low-income groups.

Confronted with the rapidly deteriorating urban (transport) environment MML in 1999 declared the urban transport sector an emergency sector (MML Council Agreement No. 05-99), defining as one of the strategic development objectives for the economic and social development of the city '*...the establishment of an integrated mass rapid transit system...*' .

### **3. Sector issues to be addressed by the project and strategic choices:**

#### **3.1. Implementing transport sector reform measures.**

Within the Municipality of Metropolitan Lima (MML) organizational environment, several entities have partial and often overlapping urban transport mandates: (i) Municipal Directorate for Urban Transport (DMTU), in charge of regulation, management, supervision and control of the urban transport and transit system; (ii) Metropolitan Investment Fund (INVERMET), a decentralized enterprise, responsible for the management of infrastructure investment projects; (iii) Municipal Enterprise for the Management of Lima highways tolls (EMAPE), in charge of collecting tolls and providing road highway maintenance; (iv) Metropolitan Planning Institute (IMP), a decentralized agency in charge of overall city planning and classification of urban roads; (v) the Autonomous Authority for the Electric Mass Transport System (AATE); (vi) the Special Metropolitan Project for Non Motorized Transport (PEMTNM) and (vii) the Special Project for the Metropolitan Area Environmental Recovery (PRAAM) linked to the Municipal Directorate for City Services and responsible for monitoring air quality, among other issues. As a result, urban transport mandates and responsibilities are unclear and policies often overlapping or even contradictory while urban transport management is fragmented and not transparent. The proposed project will support the strengthening of TRANSMET as the authority responsible for coordinating and integrating the policies developed by the various agencies into one comprehensive urban transport strategy. Furthermore, the proposed project will support strengthening of inter-agency coordination with central government (MEF, MTC, PNP) and other provincial governments (Callao, Huarochiri) on urban transport matters - either through TRANSMET or the Transport Council for Lima and Callao (CTLC).

#### **3.2. Strengthening of the legal and regulatory framework.**

Strengthening and consolidation of the legal and regulatory framework is indispensable for the establishment of adequate technical, institutional, financial and socio-environmental conditions for successful concessioning of separated bus-corridors and feeder routes. Furthermore, the legal and regulatory framework has to facilitate the operation of the new system within the existing urban (transport) environment based on the following strategic choices:

- prioritization of public transport services over private vehicles to improve access and mobility for the majority of the urban population, especially the poor segments
- creation of public-private partnerships for operation of the new system
- definition of preferred technology for mass public transport system - rapid bus transport on high capacity exclusive corridors - and preferred use of clean bus-technologies
- definition of integrated feeder-trunk route tariff structure
- re-introduction of public transport regulation including professional standards, technical and environmental public transport vehicle criteria and inspections
- mitigating provision of informal transport services

These choices are in line with the Bank's current strategy, as documented in 'Cities on the Move: A World Bank Urban Transport Strategy Review' (published: October 17, 2001).

### **3.3. Improve enforcement and control.**

Laws and regulations will only be effective if they are well enforced which requires the cooperation of the National Police as well as the creation of municipal transport inspection entity, as allowed under the new Organizational Law for Municipalities.

### **3.4. Support policies that facilitate the use of low-cost, energy efficient transport modes.**

In 1994, with the support of the World Bank, the PNTNM built a pilot network of bikeways on Colonial, Tomas Valle and Universitaria Avenues. The bikeways connected the North Cone of the city with the industrial area of Lima and Callao. The target population of the pilot project was the workers in the lowest income brackets that resided or worked in the area of influence of the bikeways. The project also contemplated an educational and promotional campaign concerning bicycle use as well as the provision of small credits for the acquisition of bicycles.

This pilot project has yielded lessons that will benefit the project regarding the design of the bikeways, and the image of the bicycle as a transport mode in the Lima metropolitan area. The main barriers to the use of the bicycle are considered to be:

- Widespread association of this transport mode with poor personal (mugging, bicycle thefts) and traffic safety.
- lack of traffic safety: with regard to road safety, the bicycle is seen as a fragile and dangerous vehicle, easily exposed to traffic accidents. Moreover, many public transport operators, who generally consider the bicycle as an obstacle to traffic, are known to molest cyclists through intentionally aggressive driving.
- lack of personal security: children and women have frequently been are the victims of robbery of their bicycles.
- long distances between home and work.

- a notorious absence of secure parking.
- obscene treatment of women: bicycle use by young women is generally seen as a transgression against the usual and accepted behavior. The most common criticism is that a woman on a bicycle is considered sexually provocative, and the “deserved” answer would be a rude, obscene, and aggressive behavior toward her.
- Poor maintenance of the infrastructure that refrain bicycle use: bikeways are not in good shape, the pavement is often in very poor conditions, bikeways are often covered by garbage and used as parking lots by cars, traffic signals are inadequate.

Supported by the proposed loan and GEF grant, MML, through PEMTNM, and FONAM will implement physical improvements and promotion campaigns to enhance the use of bicycles as a sustainable and affordable mode of transport, addressing the barriers described above.

To address these issues and based on lessons learned from the existing bikeways, the GEF component, complementing the non motorized transport component included in the loan, aims at consolidating an existing NMT project rather than starting from scratch a brand-new project, making the most out of existing infrastructure and assessing NMT perspectives in Lima through a comprehensive approach that acknowledges that good-quality infrastructure is not enough to ensure the increased use of bicycles, and has to be accompanied by a cultural change process which will be catalyzed by a multi-pronged promotional strategy.

### **3.5. Reduce automotive air pollution levels in the metropolitan area.**

The aforementioned urban transport deregulation in Lima created an oversupply of public transport vehicles not subjected to minimum emission and noise quality standards, making air pollution and noise critical environmental issues. Lima is presently among the most polluted cities in Latin America, dealing with air pollution and, as a collateral outcome, with greenhouse gases (GHG) emissions caused by the transport sector.

The saturation study of pollutants conducted by the Clean Air Committee of Lima and Callao in year 2000 revealed that particles in suspension (PM10 and PM2.5) are the most acute cause of air pollution in Lima-Callao, as can be seen on the following chart:

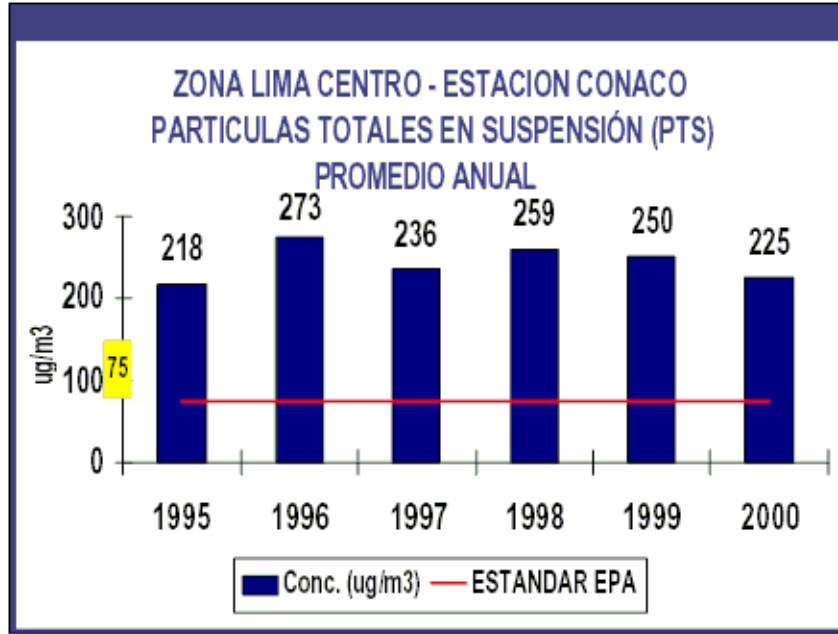


Fig 1: average PM concentrations in Lima, 1995-2000  
source: Ing. Juan Narciso Chávez, Dirección general de Salud Ambiental

The exposure of the population is quite worrying as well, taking into account that EPA's standard is 75  $\mu$ g/m<sup>3</sup>. In summer, 99% of the population is exposed to higher levels, and one third is exposed to levels more than three times as high as the EPA standard.

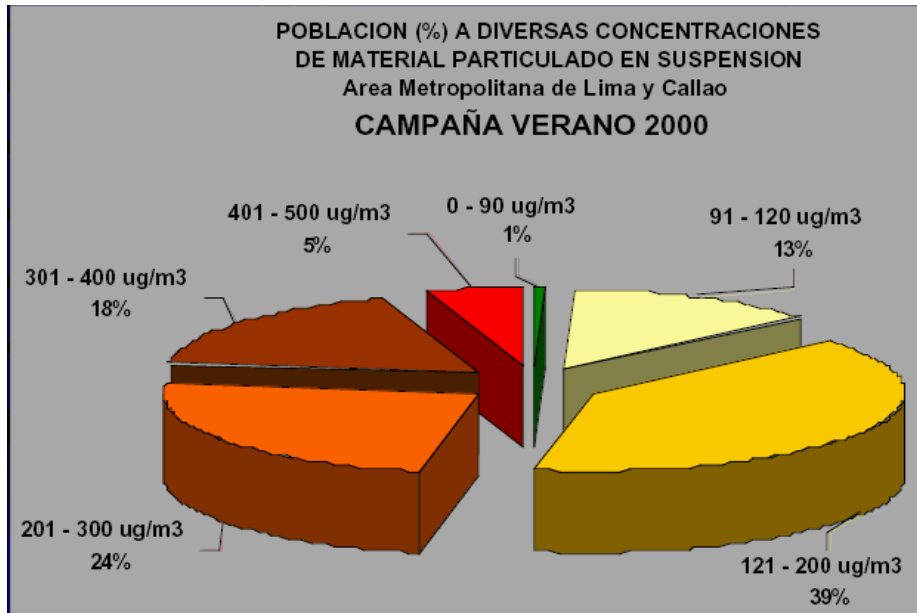


Fig 2: exposure to PM concentrations in Lima Metropolitana  
source: Ing. Juan Narciso Chávez, Dirección general de Salud Ambiental

The topography, combined with the meteorological conditions, aggravates the pollution of Lima’s atmosphere since the horizontal and vertical dispersion of the pollutants are contained by the Andes foothills. A thermal inversion acts as a cap over the city during fall and winter (April-August), inhibiting the dispersion of pollutants. In addition, absence of rain leads to the permanence of dangerous fine particles in the atmosphere.

Since air pollution gets trapped and accumulates in poor neighborhoods located along the Andes foothills, the air pollution burden falls disproportionately on the poor, and especially on the Northern Cone which will be served by both the segregated busways and the bikeways (see chart below):

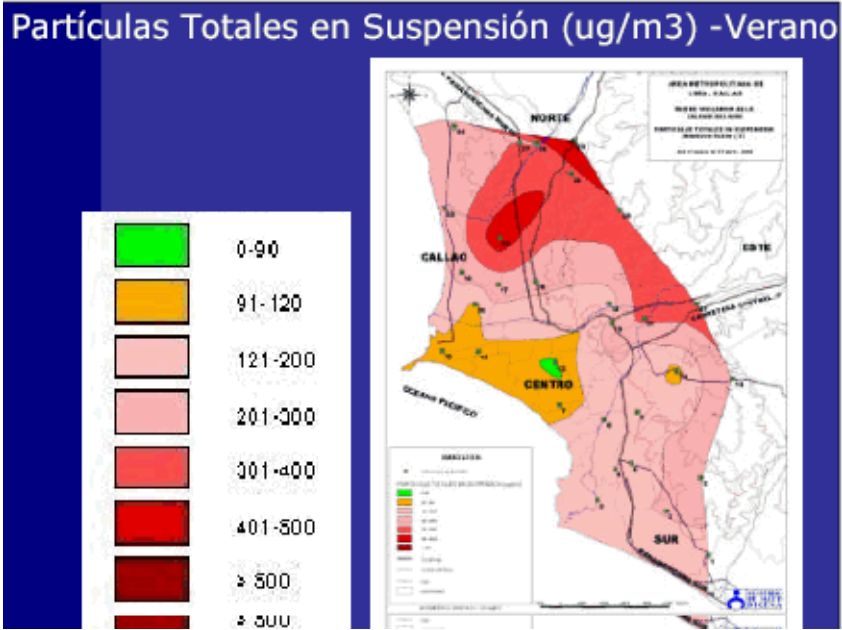


Fig 3: TPS concentrations in Lima, summer time  
 Source: Clean Air Initiative, Final Report, 2nd workshop

For the year 2000, the emissions of local pollutants from mobile sources were the following:

Pollutant	Total Emission (tons/year)	% of emission due to public transport
PM10	7,867	89%
SO2	12,752	50%
NOx	60,758	80%
CO	215,650	700%

On the other hand, transport contribution to Lima GHG emissions is 4,680,000 tons of CO2 per year, of which almost two thirds correspond to public transport, including taxis. Regarding local air pollution, the following table shows the predominant role played by this sector in terms of emissions:



**Relative contribution to emissions by sector**

Source	CO (%)	HC (%)	NOx (%)	PM10 (%)
Mobile Sources	99.60%	98.80%	87.70%	67.60%
Point Sources	0.40%	1.20%	12.30%	32.40%
<b>TOTAL</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Source: Plan Integral de Saneamiento Atmosférico Lima - Callao, Lima, Perú 2002

*Air Pollution Effects on Health*

The exposure to high concentrations of atmospheric pollutants affects the respiratory system, mainly through “Acute Breathing Infections, ABI”. According to the Ministry of Health, Lima – Callao registered 657,046 cases of ABI and 64,934 cases of Asthma and Obstructive Syndromes (AOS) in 1998. The following table shows the total particles in suspension (TPS) concentration levels, and the percentage of sickness occurrences by area.

Area	TPS	% occurrence	% occurrence
	(µg/m3)	ABIs	AOS
North Lima	247	37%	38%
Center Lima	210	14%	38%
South Lima	200	24%	7%
East Lima	185	16%	10%
Callao	36	9%	7%

The information provided by the above table shows that the Northern area of Metropolitan Lima registers the highest cases of respiratory illnesses, and also possesses the highest index of contamination by TPS.

More specifically, due to the high levels of pollution and long times of exposure to exhaust gases, one out of two traffic policemen suffers asthma or other bronchial illnesses.

The air pollution problem in metropolitan Lima has been exacerbated over the past 15 years by transport-related measures, especially full deregulation, adopted regardless of their impact on the environment. Attempts by various central government agencies and by the Lima and Callao municipalities to tackle the pollution problem were both insufficient, ineffective and were not coordinated.

Aware of these shortcomings, the government of Peru established the Management Committee of the Clean Air Initiative for Lima- Callao, by Supreme Resolution No. 768-98-PCM of December 31, 1998. The committee is chaired by the Vice-Minister of Housing and Public Works and is composed of representatives of the Ministry of Transport, Communications, Housing and Public Works, the Ministry of Health, the Ministry of Industry, Energy and Mines and representatives of the National Environment Council, the Provincial Municipalities of Lima and Callao, and the National Confederation of Private Business Institutions, Confiep.

Under the responsibility of the Dirección General de Salud (DIGESA) within the Ministry of Health a basic air quality monitoring network is presently operating in Lima. However, the technical capability of the system has several shortcomings and the project will support the strengthening and expansion of this existing air quality monitoring system. The Committee of the Clean Air Initiative will coordinate the institutional arrangements between the Ministry of Health and the Municipality of Lima to facilitate the procurement and ownership of equipment as well as the operational arrangements for the upgraded system.

It is expected that apart from improving air quality monitoring in the Lima Metropolitan Area, the project will help to strengthen the institutional role of the Clean Air Committee as the interlocutor for environmental issues.

**3.6. Assist in public transport capacity rationalization.** The oversupply of public transport vehicles that leads to alarming levels of pollution and congestion will be addressed through a scheme of financial incentives designed to entice future concessionaires of COSAC (corredores de alta capacidad) trunk routes to retire more vehicles than the minimum requirement demanded in the bidding documents as a sine qua non condition to qualify.

**3.7. Assist in social mitigation for those impacted by the public transport rationalization process.** The issue of public transport oversupply is two-fold: the most visible part of the problem is the oversupply of vehicles. The most difficult to deal with, and the one which is sometimes forgotten about, is the oversupply of "human resources". During the last decade, the public transport system has been perceived as some sort of refuge for those that the crisis made lose their jobs. These persons did not enter the transport sector by vocation, and according to the focus groups carried out during the project preparation phase, they are willing to leave that sector as long as they can find as or more interesting an alternative in another sector. Consequently, it is necessary to help those affected either to be retrained in some other technical area or/and to get access to micro-credits to launch a small business and be offered technical assistance on business management.

## **C. Project Description Summary**

### **1. Project components** (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

The project will finance 28.6 km of segregated high-capacity busways, the first phase of a network serving primarily the low-income population who need an efficient and affordable public transport service. The busways will be built along existing road corridors and thus do not require land acquisition. Major terminals will be built at the northern (Independencia) and southern (Chorrillos) ends of the busway, providing easy transfer with feeder buses serving low-income growth areas at Lima's edge; feeder roads to the terminals will also be improved, with particular focus on the accessibility by feeder buses, pedestrians and bicycles. The busway will also include 35 stations, resulting in an average distance of 753 m between stations.

While the physical infrastructure will be financed by MML and the proposed IADB and World Bank Loans, private concessionaires will finance the buses and bus maintenance equipment on the facilities provided under the Project. The fare collection system will also be concessioned and operated privately; the Project will specify an integrated fare collection system for the busway and feeder services; prepare the business plan for the bus service concessions; support the creation and strengthening of an operations entity; and assist in the development of an efficient organizational structure for the municipal management of traffic and transport. Within the framework of the latter, the project will assist the municipal transport



agencies in developing well-defined responsibilities, coordinated management and resource utilization, and performance monitoring and control mechanisms of traffic and transport.

Road safety will be addressed under a separate component, and safety audit recommendations will be incorporated in the design of the busways and associated road improvement. Air quality monitoring will be greatly improved by expanding the preliminary monitoring system that has been built up under the Bank-assisted Clean Air Initiative for Latin Cities.

### **1.1 Mobility and Environmental Improvements (US\$99.92 million)**

This component comprises primarily infrastructure works to implement the busways along existing road corridors: (i) construction of 28.6 km of segregated busways; (ii) repaving of mixed-traffic lanes adjacent to the new busways; (iii) sign posting and road markings along the corridors; (iv) traffic signal improvements along and in the immediate vicinity of the corridors; (v) bus stations and terminals; (vi) bus depots and workshops, excluding equipment which will be financed by the bus concessionaires; (vii) control center, to monitor and direct operations on the busways; (viii) paving and other improvement of feeder roads to the two bus terminals, with an approximate length of 50 km; this will include under the GEF grant the construction of sidewalks and bicycle paths to improve access conditions to the segregated busways system; (ix) road safety measures along the corridors, its feeder roads, and the streets in its area of direct influence; and (x) improvements to pedestrian and vehicular traffic in five sensitive areas, and recovery of public space, within emphasis on the interface between the corridors, pedestrians and busway users.

The proposed busway operations, including all physical works, will be based on 'inclusive design' principles that take into account the needs of vulnerable (e.g., women, elderly, children) and handicapped (i.e. mobility and visually impaired) public transport users. Some of the important measures foreseen include: i) adequate dimensions of sidewalks for wheelchair access; ii) special signage indicating disabled access; iii) access ramps of no more than 8%; iv) in the case of elevated bus stops, elevators; v) all pedestrian bridges will include or be retrofitted with access ramps; vi) at the terminals, if bathrooms are included in the final design, special stalls will be installed; and v) measures for deaf and blind passengers including sounds indicating oncoming buses, a contrasting color scheme, and textured surfaces.

In addition to the above, this component includes (xi) relocation of a flower market in Barranco and assistance to informal street vendors which will be affected by the corridor improvements, (xii) environmental mitigation at the end-terminal in the south which is close to the environmental sensitive Pantanos de Villa swamps in southern Lima; (xiii) implementation and initial operation of an improved air quality monitoring system; (xiv) development and partial implementation of a road safety strategy; and (xv) a pilot project that will enhance the introduction in Peru of more environment-friendly vehicle scrapping methods (co-financed by the World Bank loan and the GEF grant).

### **1.2 Social Mitigation and Community Participation (US\$5.75 million)**

This component deals with the stakeholders of the urban transport program and comprises four activity areas: (i) community consultation, including users and operators, to enhance awareness and ownership of the new system, including road safety education during the implementation and early phases of busway operation; (ii) mitigation of the negative impacts on current bus operators; for those who will re-enter the sector through retraining of drivers and conductors and small-scale enterprises loans to provide services linked to the new system (e.g. cleaning and routine maintenance activities), for those who will exit the sector through retraining and outplacement programs in collaboration with existing programs of the Ministry of

Labor; and (iii) technical support to operators outside the system to strengthen their managerial and professional capacities, including route planning, service provision, maintenance, road safety, knowledge of laws and regulations, etc.

### **1.3 Institutional Strengthening (US\$3.67 million)**

This component addresses the regulatory, monitoring, and control functions of urban public transport and supports: (i) the development and implementation of a public transport policy, including its regulatory and policy-setting framework, as well as its administration, operation, monitoring and control; (ii) the formal creation, technical assistance and training of PROTRANSPORTE, the entity responsible for implementing the busway operations; (iii) technical assistance and training of EMAPE, the entity responsible for implementing the physical works under the Project; (iii) technical assistance and training of DMTU and the police, focusing on public transport regulations, and its monitoring, control and enforcement; and (iv) monitoring and evaluation of the busway operation and the Project.

### **1.4. Studies and Construction Supervision (US\$8.58 million)**

This includes (i) supervision of the physical works described above; (ii) economic feasibility and environmental studies as well as the preparation final engineering designs to expand the busway network beyond the 28.6 km funded by the Project, and (iii) social impact assessments of the new system, in coordination with the urban poverty reduction strategy under preparation with Bank support. The latter forms part of a comprehensive monitoring and evaluation mechanism that will use qualitative and quantitative indicators for each of the sub-components. Techniques to be applied include user scorecards to measure public transport performance; beneficiary assessments using structured interviews and focus group discussions; poverty impact assessments using household surveys and linked to qualified data from the aforementioned methods

### **1.5. Program Administration (US\$5.58 million)**

This component, entirely to be financed from counterpart funds, includes the operational expenses of the institutions responsible for administering the Project and for implementing the busway operations, i.e. PROTRANSPORTE and EMAPE.

### **1.6. Grade Separation at Plaza Grau (US\$10 million)**

Early 2004, MML will initiate the re-construction at the Plaza Grau, one of Lima's busiest intersections and a key node of the busway to be financed under the Project. A grade separation of conflicting traffic movements is required in order to insert the busway on the northernmost end of the Paseo de la República, thereby reducing the car traffic lanes from three to two in each direction. This component will be entirely funded by the Municipality, but is a part of the overall Project.

### **1.7 GEF Project Components**

The project intends to reduce GHG emissions by improving the availability and efficiency of public transport, and in particular segregated busways, and by improving bike facilities and the image of non-motorized transport.

#### ***A. Public Transport Fleet Rationalization (US\$ 1.7 million)***

This first component aims at rationalizing public transport services and provide opportunities to reduce the size of the current fleet operating in Lima (more than 55,000 buses, most of which are extremely polluting

and obsolete). This component can be divided into three sub-activities:

- Provide financial incentives through a Credit Guarantee Fund (and hence low-cost loans) to bus concessionaires to encourage them to retire additional obsolete and pollutant public transport vehicles
- Support programs aiming at mitigating the social impacts of this program in terms of employment (training programs, access to micro-credits) in coordination with the loan.
- Support a pilot project that will enhance the introduction in Peru of more environment-friendly vehicle retirement methods and that will build the local capacity required to make sure that the adoption of those new methods will be sustainable.

***B. Rehabilitate and expand Lima-Callao bikeway network (US\$ 4.180 million)***

Through this component, the project will aim at rehabilitating and expanding the current network and resolving the existing network problems related to traffic and personal safety, low quality of the engineering design in some places, and lack of information and communication on the issue. This component can be divided into three sub-activities:

- Realize the required physical improvements on the existing network and extend it to increase its connectivity, provide bike parking facilities and install "ciclomodulos" to improve the attractiveness of the bikeways,
- Carry out a promotion campaign on bike use,
- Restart the dormant credit program called Plan Bici for bicycles acquisition, by making it more flexible and applicable to the financing of small bike-related businesses (this activity will be carried out without financial support from the GEF grant but its scope and design have been defined through GEF funds under the preparation phase).

***C. Carry out an Institutional Strengthening Program on Sustainable Transport (US\$ 1.1 million)***

This component aims at incorporating climate change and environmental considerations into decision making processes, but will also strengthen the technical capacities of the municipal teams currently in charge of transport planning and that are stakeholders of the project.

***D. Management, Monitoring and Evaluation, Replication Strategy and Administrative Costs (US\$ 950,000)***

The project includes a comprehensive monitoring and evaluation component based on qualitative and quantitative performance indicators for each of the sub-components. These indicators will include public transport and bicycle user surveys and impact assessments, public transport ridership data, road safety data, general traffic counts on trunk routes and bus counts on public transport routes given in concession.

A replication strategy will be designed in the first half of the project implementation period and carried out in the second half. Mayors and technicians of secondary Peruvian cities will be invited to Lima for field visits and discussion with their Lima counterparts while seminars on sustainable transport will be organized in their cities, with the participation of stakeholders of the Lima project.

This component includes US\$87,000 for operational costs.

Component	Indicative Costs (US\$M)	% of Total	Bank financing (US\$M)	% of Bank financing	GEF financing (US\$M)	% of GEF financing
A. Mobility and Environmental Improvements	99.92	70.4	37.94	84.3	0.00	0.0
B. Social Mitigation and Community Participation	5.75	4.1	1.63	3.6	0.00	0.0
C. Institutional Strengthening	4.77	3.4	1.50	3.3	1.10	13.9
D. Studies and construction supervision	8.58	6.0	3.48	7.7	0.00	0.0
E. Program Administration	6.53	4.6	0.00	0.0	0.95	12.0
F. Grade Separation of Plaza Grau	10.00	7.0	0.00	0.0	0.00	0.0
G. Reduction in the Public Transport Fleet	1.70	1.2	0.00	0.0	1.70	21.4
H. Bikeways Component	4.18	2.9	0.00	0.0	4.18	52.7
<b>Total Project Costs</b>	141.43	99.7	44.55	99.0	7.93	100.0
<b>Front-end fee</b>	0.45	0.3	0.45	1.0	0.00	0.0
<b>Total Financing Required</b>	141.88	100.0	45.00	100.0	7.93	100.0

NB: additional financing is expected from the private sector to purchase the new articulated buses, build the terminals, maintenance workshops and depots and buy back and scrap the old polluting buses through the scrapping program. The order of magnitude of the private sector contribution is around US\$ 80-100 million.

## 2. Key policy and institutional reforms supported by the project:

The main reform supported by the project is the pioneering of a public-private partnership in establishing COSAC where the public sector will provide the road infrastructure whereas the private sector will invest in the operational aspects, such as buses, equipment for workshops, and the fare collection system. Another key policy reform to be supported by the project will be the development of a comprehensive medium term urban transport strategy which will form the backbone for the social and economic development of Metropolitan Lima. Apart from policies that improve sectoral coordination, development of an urban transport strategy requires compatibility with land use and social development policies. Institutional reform will focus on strengthening the role of PROTRANSPORTE, which was created in response to the declared emergency situation in urban transport and transit in Lima (*Consejo MML 05-99* of January 22, 1999). PROTRANSPORTE was established with administrative and economic autonomy by *Decreto de Alcaldia* (DA35 of 18/03/02) to coordinate all transit and transport studies and projects proposed/prepared by MML agencies, as well as to coordinate related activities with other agencies (e.g., Transport Council for Lima and Callao), in order to align all sector efforts to develop an Integrated Urban Transport System for Metropolitan Lima. Through Decree 099 of March 10, 2003, PROTRANSPORTE's responsibilities were reformulated to focus on the implementation, execution and operation of studies, projects and activities related to the system of separated bus-corridors. At the same time, through Decree 092, TRANSMET was created to plan, coordinate and supervise the urban transport system for Lima (see also para. E.4.2).

In this context, the main institutional and regulatory constraints for establishing and managing an integrated and sustainable traffic and public transport system are:

1. Lack of an urban traffic and transport strategy. Development of such a strategy originates in consolidation of various urban traffic and transport policies. The strategy, which should prioritize mass public transport, will provide guidance to TRANSMET in formulating short, medium, and long term actions, facilitating coordination and integration of the municipal agencies involved in the sector as well as inter-agency coordination with other jurisdictions regarding the urban transport system. This includes reaching an agreement with the provincial municipality of Callao which issues licenses to operators who then run their buses on Lima's streets, so that the licensing process is coordinated between Lima and this municipality.
2. Incomplete legal and regulatory framework. Strengthening and consolidation of the legal and regulatory framework is indispensable for the establishment of adequate technical, institutional, financial and socio-environmental conditions for successful concessioning of separated bus-corridors and feeder routes. This includes re-regulation of the existing (in)formal bus services, considering options like turning the current fixed-term freeze on the number of vehicles authorized to provide public transport services into an open-ended freeze.
3. Weak institutional capacity of public agencies and weak professional capacity of operators involved in public transport. Strengthening of institutional capacity and training of public and private urban transport professionals will facilitate the proposed restructuring and rationalization of the sector.
4. Lack of enforcement and control capacity within the municipal structure. Compliance with laws, regulations and route concessions depends on a reliable enforcement and control mechanism which requires the cooperation of the National Police as well as the creation of municipal transport inspection entity, as allowed under the new Organizational Law for Municipalities. The lack of enforcement capacity has been one of the principal constraints for imposing inspection and maintenance standards on public transport vehicles.

With support of both the Bank loan and the GEF grant the project will also strengthen the recently resuscitated non motorized transport agency PEMTNM through providing it with both technical assistance and capacity building to strengthen its planning, design, implementation, management and evaluation of non motorized transport facilities, expanding their focus to include the interests of pedestrians and mobility constrained people. The expected changes of mentality and raising expectations amongst citizenry vis-à-vis NMT, should further contribute to the long-term sustainability of this entity.

### **3. Benefits and target population:**

#### ***Lima Transport***

The segregated bus corridor system, with larger and cleaner vehicles, operated by the private sector through well-enforced concessions will: (i) increase service efficiency and reduce GHG and local emissions per passenger-km; (ii) increase the service quality and reduce travel times; (iii) rationalize public space consumption by various transport modes; and (iv) prioritize public transport and low cost transport alternatives over private cars. It is expected that the proposed activities will yield significant benefits to the urban transport sector, including reduction of traffic congestion and improved traffic flow for all vehicles reducing emissions per vehicle-km; improved road safety by eliminating predatory driving behavior of public transport vehicles; improved financial sustainability of the public transport system; improved economic efficiency and competitiveness of the city through reduced travel times; and provision of better accessibility to low-income commuters.

Main beneficiaries of the proposed project are the users of public transport, primarily the poor and very poor living in the northern and southern cones of Lima, as well as the most vulnerable road users. There is a direct relation between the expected benefits and the tariff policy applied under the new Lima Transport system and the proposed integrated trunk-feeder route tariff, which is competitive with single trip tariffs in the 'conventional' system, is expected to reduce household expenditures for transport in the longer term. The use of inclusive project designs benefits the most vulnerable road users through improved access for mobility constrained people, and also includes sidewalk rehabilitation and construction and upgrading of bicycle facilities. Other potential beneficiaries include the residents and businesses along the new corridors who are likely to see an increase in property values because of better accessibility and improved mobility options. Last but not least, the rationalization of the bus routes combined with a better enforcement is expected to reduce congestion along most transport corridors, benefiting all road users.

The low-income areas served by the corridors and feeder routes are expected to benefit from better access and facilitation of low-cost transport alternatives (bicycles, walking). Firstly through expanded labor market, health facility, education, and other social services opportunities; secondly, as a result of the first, a raised level of self-esteem and development potential within the community.

Existing formal bus-operators on routes not affected by the proposed project will benefit from training courses targeted at increasing their professional capacity in terms of planning, operation, administration and maintenance of bus services. Furthermore, the increase in enforcement and control of bus-route concessions will reduce unfair competition from informal operators, creating a healthier and safer operations environment.

Institutional strengthening of MML institutions involved in transport will create an efficient and effective urban transport management system with well-trained and capable agencies that have clearly defined responsibilities within a supporting legal and regulatory framework that defines collaborative planning, management, enforcement and control mechanisms to ensure efficient use of available resources.

### ***GEF supported component of public transport capacity rationalization***

Benefits will accrue to the residents of Lima Metropolitan Region since all inhabitants are affected by air pollution and almost all have to travel in the city. The major benefits will show in emission reductions of local and global pollutants, which translate into health improvements for the target population, positively impacting school attendance to school, better performance, and improved productivity. Also, shorter travel times and less congestion offer better quality of life for Lima Metropolitan area, and put more opportunities within reach of its inhabitants.

### ***Non-motorized transport***

The population of the districts served by the bikeways amounts to almost 1.5 million people, most of them low-income citizens.

Bikeway users will benefit from a safer infrastructure and the whole vicinity will enjoy a more pleasant urban landscape since the bikeways will be rehabilitated following high quality designs and green areas will be developed next to them. The so-called "ciclomodulos" are expected to become some sort of local landmarks around which activities will flourish, providing the neighborhoods with more leisure opportunities.

From a household expenses perspective, bike users will save on bus fares. On the basis of the present bus fares levels and of average per capita incomes in the area, using a bicycle twice per day will allow savings of approximately US\$ 7.6 per month, i.e. 9 % of the average per capita income. This is the order of magnitude of what these households spend on their energy bill.

Some permanent and provisory jobs will be created, mainly due to the bikeway rehabilitation, their maintenance, to the services to be offered in the vicinity (cycle-modules, outlying business), in some small bicycle repair businesses, etc.. Reductions in social costs associated with bus travel (accidents, pollution, congestion) are expected as well.

#### **4. Institutional and implementation arrangements:**

It is envisioned that the proposed project will be implemented within the 5 year election cycle of the present Mayor of Metropolitan Lima. The Municipality of Metropolitan Lima will be the Borrower and the GoP will be the guarantor. MML will assume the foreign exchange risk associated with the proposed loan. The Loan and the Grant will each have one executing agency: (i) PROTRANSPORTE for the Lima Transport project and (ii) FONAM for the GEF project. For the Lima Transport project, the procurement and supervision of civil works will be delegated to EMAPE, while the procurement of goods and consultant services will be done by PROTRANSPORTE. For the GEF grant, part of the procurement and supervision of civil works (bikeway network rehabilitation and extension) will be delegated to the Programa de Transporte No-Motorizado de la Municipalidad de Lima (see details in the procurement plans). The GEF sub-component aiming at mitigating the social impacts of the public transport supply rationalization component will be procured and supervised by PROTRANSPORTE together with the matching sub-component of the WB-IDB loan. None of the implementing agencies has experience in working with multilateral institutions and a preliminary procurement assessment shows that both institutions will need training and adequate staffing to meet the Bank's procurement requirements. The same observation is valid for EMAPE, the agency that will be responsible for procurement of civil works. At appraisal, a detailed procurement capacity assessment will identify the staffing and training needs of PROTRANSPORTE, EMAPE and FONAM, to be implemented before project effectiveness.

PROTRANSPORTE will be responsible for the financial management arrangements of the loan proceeds and FONAM will be responsible for the financial management of the GEF grant. The Borrower for the loan will be the Republic of Peru. PROTRANSPORTE has no previous experience working with multilateral institutions. FONAM has previously executed a small grant for US\$ 350,000 for the preparation of the project, however, financial management responsibilities were carried out by another agency (UNDP). Both Project Implementing Units ( PIUS) will have primary responsibility for project coordination, monitoring and reporting tasks.

Establishment of the PIUS with appropriate staffing, organization systems, facilities and other resources in a manner satisfactory to the Bank will be a condition of loan and grant effectiveness.

Each PIU will maintain and operate a Special Account in accordance with the requirements of the Bank's Disbursement procedures. Disbursements will be transaction based (ie against Statements of expenditure (SOEs), full documentation, direct payments or special commitments). Deposits into the Special Account and replenishments up to the authorized allocation set out in the legal agreement would be made on the basis of applications for withdrawals accompanied by the supporting documentation in accordance with Bank disbursement procedures.

With respect to counterpart funding, each implementing entity would, until the completion of the Project, operate and maintain an account in Local Currency which will be used to issue checks or transfers to the

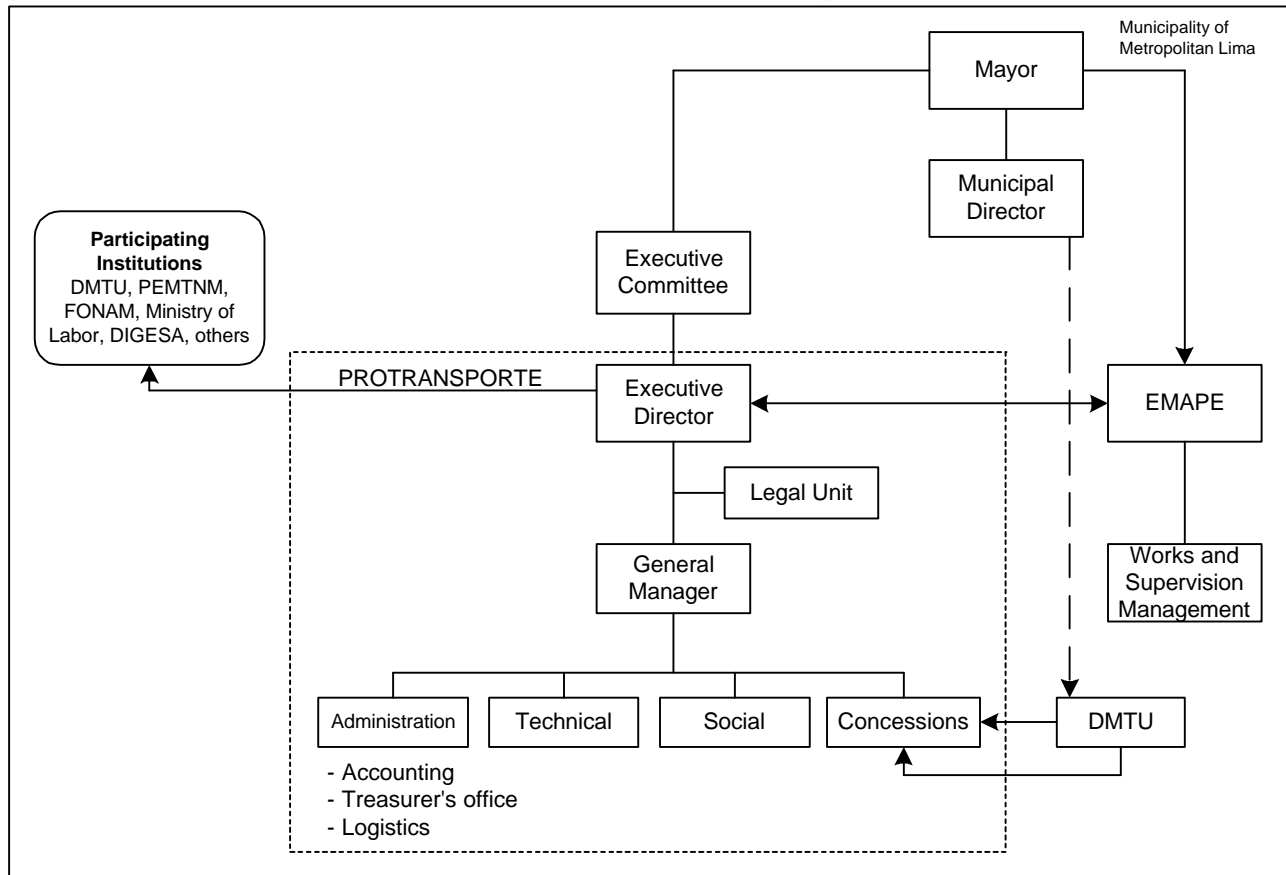


providers of goods and services, in accordance with the counterpart financing percentages agreed.

PROTRANSPORTE will be responsible for concessioning the buscorridor and feeder route operations to the private sector: this needs to be done in close coordination with DMTU, the agency responsible for concessioning the present bus routes in the MML area. Coordination procedures and agreements will be included in the operational manual which will be presented in draft at negotiations.

The current MML administration is preparing various institutional reform measures aimed at creating a more effective and efficient operational structure, which among other things, would facilitate greater private sector participation, inter-agency coordination and public transport priority. Appropriate provisions will be included in the legal agreements to ensure that none of the reforms or streamline measures would have an adverse impact on the proposed project and/or GEF grant.

**Esquema de Ejecución  
Proyecto COSAC (corredores de alta capacidad)**



## **D. Project Rationale**

### **1. Project alternatives considered and reasons for rejection:**

#### **Choice of Transport Mode and Alignment**

In the late 1980s, the national Government initiated the construction of a heavy rail line (*tren eléctrico*) in southeastern Lima. A 10-km long stretch of that line became operational in 1993, but could not be opened for passenger service as the travel demand was too low to justify the operating subsidies that would have been necessary. The rail line was transferred in 2001 to the municipal government which initially considered to implement a “MetroBus” system, in which three high-grade-bus services would have linked up with the *tren eléctrico* to feed passengers into the rail line. This option was discarded because it was not economically feasible and would have required a substantial operating subsidy.

Between 1996 and 1998, the Peruvian Government and the World Bank collaborated in the preparation of a Lima Urban Transport Project, a process that was terminated in 1999 because of increasing political disagreements between the national and municipal governments. The project envisaged segregated busways, somewhat similar to the proposed Lima Transport Project. However, there are significant changes in the current project: (a) another corridor was chosen in the city center and to the north to cater for a higher demand and eliminate the need for resettlement; and (b) the new operational scheme is fundamentally different, taking account of the experiences acquired under Bogotá’s innovative TransMilenio system which started operation in late 2000.

PROTRANSPORTE studied the alternatives which ended in the selection of the basic network that serves the sub systems in the north and south of Lima, based on the representative indicators of the construction aspects (cost, construction facility and the need for expropriation and relocation), operational (demand, operators affected, economic feasibility, and functionality), social and environmental impact, and integration with other urban development and environmental protection plans and projects. The option of connecting the Northeast Sub System in the first phase was discarded primarily because of a lack of viable options to cross the Rimac river. An economically viable option relies on the use of the planned *Puente de Confraternidad* – a Japanese gift to Peru: however, as to date exact location and time schedule for construction of this bridge are unknown. The option of connecting the Southeast Sub System in this phase was discarded because of access problems to the Atocongo terminal which requires significant expropriation/resettlement.

#### **GEF Public Transport Capacity Rationalization Component**

Several alternatives to the guarantee fund have been considered. The following table summarizes the scope of these options and the reason why they have been eventually discarded:

<b>Nature of the benefits that bus owners willing to retire their oldest and dirtiest vehicles would have benefited from</b>	<b>Reasons for being eventually discarded</b>
Tax reductions or exemptions on the purchase of new vehicles, on sale taxes or on the purchase of inputs necessary to the operation of a public transport company, such as diesel or spare parts.	<ul style="list-style-type: none"> <li>➤ Lack of support from the Ministry of Finance who was reluctant to give clearance to a measure likely to reduce its already shrinking fiscal revenues.</li> <li>➤ Implementation complexity, high transaction and supervision costs.</li> <li>➤ Risk that measure was perceived as socially unfair.</li> </ul>
Direct purchase of the old vehicles or payment of a fixed share of their market price to stimulate their removal.	<ul style="list-style-type: none"> <li>➤ Limited impact considering the price of the old units to be purchased and the amount available.</li> <li>➤ Non sustainable, meaning that additional funds would be needed every purchase round, whereas the loan guarantee fund is always there to guarantee loans.</li> <li>➤ Generation of a market distortion.</li> <li>➤ Complex price determination.</li> </ul>
Revolving Fund dedicated to provide public transport operators with low interest rates loans to purchase <b>new</b> vehicles.	<ul style="list-style-type: none"> <li>➤ Limited impact considering the price of the new units to be purchased and the amount available.</li> <li>➤ Creation of a distortion in the credit market.</li> </ul>
Legal benefits such as the regularization of informal operators or the cancellation of their unpaid fines.	<ul style="list-style-type: none"> <li>➤ Would be perceived as a sort of premium given only to those who infringe the law.</li> <li>➤ Would not be an attractive incentive for legal operators or those with no unpaid fines.</li> </ul>
Free or subsidized access to training programs that would allow those impacted by the vehicle retirement to get training and find a job outside the sector.	<ul style="list-style-type: none"> <li>➤ This option was seen as complementary to the Guarantee Fund but not sufficient as a stand-alone incentive. It was consequently decided to associate it with the Guarantee Fund.</li> </ul>

To conclude, the ultimate benefit of the chosen option lies in a lower interest rate (essentially, the elimination of the “risk premium”) and no collateral requirements, because the GEF funds would be used to guarantee the loans. Without this financial instrument, it would be possible to simply require the retirement of a certain number of vehicles, and let the bidders decide how best to finance that, but then the bidders would have access only to relatively high-cost loans and might resist this requirement or may not be willing to go beyond the minimum requirement and refuse to retire additional buses, in spite of the incentives offered through the evaluation methodology of the bidding proposals. The chosen option in essence makes low-cost loans available.

### **Non-motorized transport component**

The alternative was to focus on the extension of the current network, mainly to extend its catchment area rather than to rehabilitate the existing network. The results of the focus groups emphasize that the low rate of bike use is explained by the lack of personal and traffic safety and the inappropriate shape of the existing infrastructure. As a consequence, it was decided to focus efforts on rehabilitation rather than building more. Nevertheless, some small extensions will be built in order to increase the connectivity of the network and complete it with crucial short missing links.

**2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned).**

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
<b>Bank-financed</b> Rehabilitate essential transport infrastructure and assist in institutional reforms to strengthen transport management	First Transport Rehabilitation Project	S	S
Rationalization of urban transport in Bogotá	Colombia Urban Transport (Transmilenio)	HS	HS
Impact of Line 4 on Poverty in the Sao Paulo Metropolitan Region	Sao Paulo Metro Line 4 Project	S	S
Rationalization of urban transport in Santiago (planned)	Santiago Urban transport, associated with GEF		
Rationalization of urban transport in secondary cities of Colombia (planned)	Columbia Urban Transport		
Rationalization of urban transport in Méxicio, DF	MX-Air Quality Management And Sustainable Transport Project associated with GEF		
<b>Other development agencies</b> Inter-American Development Bank  IDB GEF-PNUMA  GEF-MONDER JICA  Swiss Cooperation Canton Zurich, Swiss	Development of sustainable transport program in Arequipa, Peru  Transport Concessions, MIF Environmental Citizenry in Lima  Biofuels in Lima Elaboración del Diseño Detallado para el proyecto Construcción del Puente Con-fraternidad Perú-Japón (Ministerio de Trans-portes, Comunicaciones, Vivienda y Cons-trucción)  Air Quality Study Donation of air monitoring equipments		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

### **3. Lessons learned and reflected in the project design:**

To build upon the experience of previous urban transport and urban projects around the world, an analysis of Implementation Completion Reports and Performance Audit Reports (ICR/PAR) was undertaken. This review recognized the trends and changes in project design after the ICRs/PARs were completed. The main lessons identified and incorporated to the design of the proposed project are:

#### **3.1. Institutional Strengthening.**

As demonstrated by the Curitiba and Bogotá bus rapid transit (BRT) systems, important sector reforms and operational improvements as proposed under the Lima Transport project require visionary leadership with a willingness to take risks, long-term commitment and continuity. By prioritizing the project preparation – stopping competing civil works - and allocating adequate preparation resources, the newly elected Mayor of Lima has already shown his leadership and commitment. The key organizations dealing with urban transport at the municipal level must be reorganized and strengthened, and dialogue assured. To this extent, studies included in the institutional component must be carefully monitored and translated into action plans, which the Borrower must implement. The proposed project already has a fully operational entity named Protransporte, which is monitoring and evaluating the completion of critical studies required by the project as well as supervising the work of international consultants, gaining ample experience to manage the project.

#### **3.2. Lack of Timely Counterpart Funding.**

Lack of counterpart funding has greatly influenced the pace of project implementation in several projects and in some cases has even led to cancellation of components. An effort must be made to ensure that the adequate provision of counterpart funds is included in the annual budget of Metropolitan Municipality of Lima. PROTRANSPORTE is preparing a mechanism that will create a project account to obtain the local counterpart funds in a timely manner from the different sources of income that the Municipality, on a yearly basis, receives.

Apart from the lack of counterpart funds, several projects in Peru suffer from the disbursement capacity ceiling, agreed upon between MEF and the IMF. Basically, all projects have to compete under this ceiling – currently US\$450 million - for their annual disbursements, which may result in insufficient disbursements to adhere to the project implementation schedule.

#### **3.3. Slow Implementation.**

This has been a frequent theme. Apart from the disbursement capacity problem, reasons have included a lack of familiarity with Bank procedures, overoptimistic scheduling at appraisal, lack of final engineering designs at appraisal, changes in political commitment, and lack of counterpart funds. These problems would be mitigated in the proposed project by such measures as:

- i. Strengthening financial management capacity of PROTRANSPORTE and provision of training on Bank procedures;
- ii. Requiring the submission of final engineering design for the first year of project works prior to negotiations; and
- iii. Providing technical assistance as needed.

### **3.4. Monitoring and Evaluation mechanism in place.**

Although most projects included a set of project monitoring indicators and targets, frequently implementation units did not use them for project management or as a monitoring tool as an “early warning device”. This constrained effective implementation of the monitoring process and reduced ability to measure fulfillment of the development objectives or the performance of the other project executing agencies. The project is including a monitoring and evaluation investment component and will propose to create a specific unit within PROTRANSPORTE to be in charge of monitoring and evaluation tasks.

The Bank has a long-standing involvement in the sector of air quality management, in general and its interrelationship with urban transport in particular. The first loan of that nature was approved in 1992, and it had the objective of reducing traffic-generated air pollution in Mexico City. Stemming largely from that participation, the Clean Air Initiative in Latin American Cities was set up in 1997, which has been highly successful in disseminating experiences among major cities, including Lima. Similar clean air initiatives have now been started in Asia and Africa. In addition, recent strategy papers on Pollution Management Masami Kojima and Magda Lovei, *Urban Air Quality Management – Coordinating Transport, Environment and Energy Policies in Developing Countries*, World Bank Technical Paper 508, 2001. and *Urban Transport Cities on the Move*, a World Bank Urban Transport Strategy Review, 2002. discuss extensively the effects of urban traffic on air quality. Urban transport operations in Bogotá, Buenos Aires, Lima and São Paulo include air quality management components in their design. Some of the lessons learned include:

### **3.5. Air quality management and urban transport development involve long-term issues that require long-term responses.**

Changes in personal travel behavior – a key element to reduce traffic-generated air pollution – are unlikely to occur unless there is a long-term government commitment to sustainable transport. Similarly, improvements in air quality require a long-term vision such as has been spelled out in Mexico City with the publication of the Air Quality Management Plan for 2002-2010.

### **3.6. Planning for the long term, however, requires flexibility.**

Mexico City experience has shown that, despite the best planning efforts in the preparatory stage, the need for adjustments in air quality activities becomes evident only during the plan implementation. Similarly, the Implementation Completion Report for the Bogotá Urban Transport Project states that “flexibility should be encouraged in some subcomponents, procedures or new technology areas. This occurred in the case of the Transmilenio components where adaptations had to be made in various areas (platforms, bike paths, bridges, surfacing materials, etc, and with very satisfactory results). Therefore, while each component of the proposed project has been defined in considerable detail, the Grant Agreement should leave room for modifications during its implementation.

### **3.7. The Bank’s involvement should support an overall Government strategy.**

This applies to most World Bank operations. The more successful urban transport and air quality projects, such as those of Bogotá and Mexico City confirm this maxim. The proposed GEF components would complement the overall project which supports the objectives of the Urban Transport Strategy of the Municipality.

### **3.8. Community Participation is Vital For Success.**

The PAD for the recently approved GEF grant to support the introduction of climate friendly measures in transport of Mexico City stresses that a “participatory approach, incorporating public opinion in the project, is required to establish legitimacy of the project”. Similarly, the Bogotá experience demonstrates the importance of community involvement which contributed to the public acceptance, even pride, for several “project outputs, notably TransMilenio and the bike paths”. The proposed project – especially the components aiming at increasing bicycle use and at reducing public transport oversupply– was prepared in close consultation with civil society; this collaboration would continue during project implementation.

### **3.9. More construction of bikeways does not ensure the increased use of bicycles.**

In 1996, about 46 km of Bank-financed bikeways were successfully implemented in Lima, connecting an industrial area with low-income residential zones. However, the number of cyclists did not increase significantly, as the project did not include a coherent strategy to overcome the cultural barriers inhibiting bicycle use. Even in Bogotá, where over 200 km of bikeways were built in the last four years, the growth in cycling has been modest, and the local Government intends to implement – under the next Bank-financed project – a promotional strategy to raise bicycle use. Therefore, an important component of the proposed project would start the cultural change process through a multi-pronged promotional strategy aimed at making bicycle use more attractive in the minds of the population.

## **4. Indications of borrower and recipient commitment and ownership:**

The Municipality of Lima has demonstrated its commitment to and ownership of the project by creating the PROTRANSPORTE project-executing unit with financial and administrative autonomy within MML, directly reporting to the Mayor of Lima. The main functions of this unit are to establish urban transport policies within the Municipal Corporation, to execute the proposed project, and to coordinate the different internal and external institutions related to urban transport sector. PROTRANSPORTE has an assigned budget for project preparation of US\$2.1 million for the years 2002 and 2003. In 2003, MML also created TRANSMET a commission with representatives of all municipal agencies involved in urban transport, as the coordinating and planning agency for metropolitan transport.

Another commitment to the project was the cancellation of IDB loan for Lima Historical Center ready for IDB board approval in August 2002, after spending US\$1 million in project preparation. The cancellation of this proposed loan was agreed upon between MML and IDB. Due to the limited indebtedness capacity of the Municipality, it became evident from several financial capacity studies that MML could not absorb new credits based on current and projected financial situation including the proposed Lima Transport project. Focusing on more immediate urban transport issues was agreed as the highest priority.

Late 2003, MML will start, with its own resources, the reconstruction of Plaza Grau which forms a key link in the proposed buscorridor project. The reconstruction includes a grade separation of conflicting traffic movements to facilitate insertion of the bus corridor.

Newly-elected municipal authorities have shown interest in the GEF project. Only a few days after the election outcome was known, the mayor of Lima asked for a presentation of the GEF project and was quite supportive of its objectives. As part of his electoral campaign, he, himself a cyclist, visited the bikeways and identified the poor public transport quality as one of the top priorities of his agenda. One of his first decisions as a mayor was to reestablish within the municipal technical units the non-motorized transport unit that had been dissolved by his predecessor. This unit will include a high-profile personality, a former well-known Peruvian champion cyclist, that already has a lot of experience in NMT promotion and

bikeway implementation.

At the national level, the Ministry of Finance was involved in the design and preparation of the GEF aspects through its inclusion in the GEF project Consultative Committee, which resulted in active participation that helped fine-tune the project concept.

## **5. Value added of Bank and Global support in this project:**

The Bank has extensive experience in supporting projects on urban transport system. For example, in projects in Brazil and Chile the Bank supported the concept of physically separating buses from worsening traffic congestion. In Bogotá, the Bank is supporting a second phase of separated bus corridors as part of the very successful TransMilenio bus rapid transit system, which was first introduced in Curitiba. The proposed project for Lima has been designed along the lines of the TransMilenio in Bogotá. The experience gained in Brazil and Colombia in this sector will be key in assisting MML's efforts to improve the urban transport system. Bus Rapid Transit systems are being introduced rapidly all over the world as a low cost, effective mass transport alternative. Latin America remains the leader in applying this technology, with BRT's under preparation in Santiago, five secondary cities in Colombia, Mexico City and San Salvador.

The Bank has assisted the Municipality of Lima since 1995 to resolve the transport chaos in the city, but a previous proposal for a separated bus-corridor (Corredor Vitrina) was stranded because of lack of central Government support. It is worth mentioning that this is the first project granted to a municipality in Peru since the 80s and therefore, it so represents a first step toward empowering and strengthening local governments toward sector development in strategic planning, and improving intra-governmental relations. This fits well within the decentralization strategy adopted by the Government of Peru.

The World Bank is presently administering three other GEF transport projects, based on OP 11, two of which are located in Latin America (Mexico and Santiago, the other one being in Manila). The sum of these project represents a valuable knowledge bank and experiences from these other cities will be quite useful in Lima, and vice-versa, since the overall objectives are the same and some of the components are similar. "Technical and political cross-fertilization" between those cities is already taking place through events sponsored by the World Bank, either at the decision-making level (official encounters between mayors) or at the technical and operation levels (meetings between bus operators from those different cities, seminars on BRT, etc.).

## **E. Summary Project Analysis** (Detailed assessments are in the project file, see Annex 8)

### **1. Economic (see Annex 4):**

- Cost benefit      NPV=US\$61 million; ERR = 20.7 % (see Annex 4)
- Cost effectiveness
- Incremental Cost
- Other (specify)

An economic analysis was undertaken of the key physical components of the project, comprising a cost of US\$134 million or about 80% of the total project cost (including those components—such as the underpass in Plaza Grau—to be fully financed by the government, but critical for the proper functioning of the project as a whole). In the analysis, the cost of acquiring new vehicle fleet and replacing and scrapping some of the existing excess fleet is also taken into account.



The economic analysis encompassed the analysis of the costs and benefits incremental to a “without project” situation consisting of the improved provision of the existing transport services without major investments (except for the normal key improvements to facilitate traffic flows along corridor). Under this situation, the expected increase in the population and in the travel demand along the corridor (which is assumed to be similar to the “with project” situation—that is, no additional induced demand—erring on the safe side, as this assumption favors the “without project” situation), will produce travel times for passengers and private car users and vehicle operating costs to the bus operators that are compared to the “with project” situation.

For the “with project” situation, the analysis includes the effects from both the “trunk” lines and the “feeder” lines. The analysis includes the assessment of the operating costs for these two types of services which differ as for the trunk network the vehicles are new, high capacity buses, while for the feeder lines the vehicles consist of existing vehicles that will be substituted during the project life. For the savings in travel times, as stated above, it is assumed the same number of passengers for the “with” and “without” situations and an average value for travel time savings (reflecting the methodology long established by the Ministry of Economy and Finance). The more limited benefits to private cars would accrue from less congestion and enhanced traffic flows along the roads and streets where the main trunk and feeder bus services would be in operation. The costs associated with the interferences to existing traffic during the two-year construction period is also incorporated in the calculations. Annex 4 details the methodology and the main assumptions adopted in the cost-benefit analysis of the project.

With conservative assumptions, the analysis shows the robustness of the economic feasibility of the project, yielding an NPV (at the 14% discount rate established by the MEF) of US\$61 million and an Economic IRR of 20.7%. The sensitivity and risk analyses further show this robustness, with a less than 2% probability that the project would turn non-economic. Most of the travel time savings (more than 97%) accrue to the users of the buses (largely, lower income people).

## **2. Financial (see Annex 4 and Annex 5):**

NPV=US\$ million; FRR = % (see Annex 4)

The financial capacity of the city of Lima must be analyzed within the context of an only recently abolished highly centralized decision making environment. Among other things, this environment restricted the economic and fiscal autonomy of local governments. Although actual legislation is restrictive in attributing fiscal authority to the municipalities, the local government of Metropolitan Municipality of Lima (MML) has political, economic, financial and administrative autonomy. The municipality provides a variety of services based on the organizational law for municipalities (Ley Organica de Municipalidades). The basic services provided by the MML include garbage, collection and disposal, street paving, transport services and traffic management improvements, urban markets, park and social services. The sources of revenues for operating these programs include own resources revenues such as property taxes, user fees, license and permit fees, and penalties and sanctions. Funding for capital improvements comes mainly from central governments transfers via the Municipal Compensation Fund (FONCOMUN) and the Municipal Enterprise for the Management of Lima highways tolls (EMAPE), in charge of collecting tolls and providing highway maintenance within MML's territory.

MML has an annual budget of approximately US\$115 million (2002), representing an annual expenditure capacity of about US\$16 per capita, which is significantly lower than normally encountered in Latin American cities of this magnitude, and limiting MML's capacity to meet the city's needs. However, over the period 1998-2002 the city experienced sustainable annual increases in recurrent income, more

specifically in income from taxes, road tolls, fines and transfers from central government, representing 96% of total income.

In order to obtain financing from multilateral banks Law 27958, which was recently adopted modifying the Fiscal Prudence and Transparency Law, prescribes a number of criteria to be complied by MML, before the mML can obtain a loan guarantee from the Government of Peru - details are provided in Annex 16. Preparation of the Lima Transport project included the analysis of MML's historical income and expenditure for the 1998-2003 period to verify MML's compliance with Law 27958, more specifically the existence of a primary results surplus during the 2001-2003 period. The analysis of the MML's historical financial performance confirms that the MML complies with the key financial indicators included in the Law, confirming MML's eligibility for a sovereign loan guarantee by the Government of Peru.

As indicated in the Annex 16, financial projections of MML finances until 2015 show that the Municipality will be able to provide timely counterpart funding and service its debt. However, it will have to carefully manage its current and capital expenditures and to adhere to its proposed Fiscal and Financial Action Program that will help maintain a sound financial situation during the implementation of the proposed project.

During the project implementation and in order to avoid financial deficits of MML that could be generated by the project and/or other investments, it was agreed that MML and both Banks would monitor through the quarterly progress reports the fiscal and financial situation of the municipality on the basis of the financial monitoring indicators stipulated in the Law.

Finally, a financial mechanism has been designated to guarantee repayment of the Bank loan through the creation of a Trust Fund in a commercial Bank, which will serve as the 'agent' that repays the Loan to the Banks. The establishment of this Trust Fund is a MEF condition for providing the sovereign guarantee to MML. The conditions for the Trust Fund, were discussed with and approved by both Banks. The Trust Fund must be established at the time of signature of the loan agreement. Annex 16 provides details of this mechanism.

The GEF program funds two financial instruments, (i) the Credit Guarantee Fund to secure low-cost loans to buy and retire old buses and (ii) the micro-credits to support the creation of small businesses, that will be financed by the GEF through a revolving fund, which means that a strategy has to be defined regarding the destination of those funds once the GEF project is closed. Loan maturities, both related to the Credit Guarantee Fund and to the micro-credits, should not go beyond project closing in order to have the funds available early enough and decide jointly with the PIU on what to use them for. As a condition for disbursement of this component, the grant agreement requires (i) FONAM to issue a letter to the Bank defining their investment strategy vis-à-vis those funds once they are returned to FONAM at the end of the project implementation period, (ii) FONAM and Protransporte to execute a specific agreement (convenio específico) where by Protransporte commits to return the proceeds of the Credit Guarantee Fund and the micro-credits six months before project closing. Even though the scheme aims at establishing a revolving fund that could keep backing up loans taken by concessionaires in response to bus retirement triggered by the extension of the busways, this clause will establish an alternative use of the funds in case there is no more demand for this kind of financial services at project closing. This way, if those funds are not of any use at the end of the project because the objectives for which they have been granted have been reached and/or that no similar segregated busways project is planned in the foreseeable future, they will be destined to projects such as bikeway extensions, pedestrian facilities, low-emission transport technologies, coordinated land-use and transport planning, etc. The ultimate exit strategy of the GEF Credit Guarantee Fund will be determined on the last year of project implementation. At that time, projections of default

coverage will be more reliable, and the PIU will be able to estimate the amount of funds remaining in the Credit Guarantee Fund after client loan retirement, and decide on what could be done with those amounts.

There is a strong commitment from Lima and Callao to support the non-motorized part of the program. The mayor of Lima sent a letter to the Bank to confirm he is allocating those US\$ 600,000 left from the previous NMT project to bike-related activities. The Municipality of Lima assigned this year to its new NMT unit 970,512 soles and will substantially raise this allocation in the following years when works are executed. The design of the bikeways feeding the busways is very much advanced and covers 17 km in the northern part of the alignment, 10 in the southern part, for a total of US\$ 950,000 to be financed by the WB-IDB loan. An international seminar, where the mayor of Bogotá was the guest of honour, was held on April 9, 2003 on the GEF aspects of the project and sustainable transport more generally, targeting national congressman and local politicians, in order to secure additional support for the project. This seminar built on the existing political momentum which recently showed for example, in Miraflores and San Isidro, two middle-income districts being served by Arequipa Avenue, where bikeways were part of the electoral platforms of those eventually elected. The mayor of Miraflores, followed by those of El Callao, Independencia, Carmen de la Legua, Comas, San Isidro, Rimac, etc. have expressed his enthusiasm for NMT and the GEF project and said they will support the project. The current campaign to convince distrital mayors into supporting the NMT agenda is going full speed and a seminar to secure their commitment was held on June 14, during which mayors from both Lima and Callao along with mayors from the municipal districts showed strong commitment to the NMT program. To end with, in early October 2003, both the municipalities of Lima and Callao sent to the Bank letters indicating that their financial participation to the non-motorized transport component will be, respectively US\$ 834,000 for Lima and US\$ 466,000 for Callao.

#### **Fiscal Impact:**

### **3. Technical:**

With financial assistance from a Spanish Trust Fund, the IDB contracted in mid-2002 a consortium of engineering firms, whose work is expected to be substantially completed by April 2003. While most aspects of busway planning and design are available in preliminary form, more work is required to resolve such issues as: (a) circulation planning and traffic engineering at locations through which the busway will pass; (b) details of pedestrian access to the Lima Transport stations which, in their majority, will be located in the center of major arteries; (c) location of bus depots near the northern and southern ends of the busway; (d) level of engineering detail that is needed for tendering the civil works; and (e) selection and design of feeder roads in the districts of Comas/Independencia and Chorrillos/Barranco. Moreover, upon the lobbying of manufacturing companies interested in selling new buses, MML has received requests to issue new bus route concessions which would be in conflict with the Lima Transport concept; missions of the Bank and IDB have expressed their concern about this possible development and expect that MML will postpone any decisions in this regard, for the time being.

The GEF components do not envisage using new or unproven technologies. The building designs of the bikeways has benefited from the supervision of renowned experts and will integrate lessons learned from the previous pilot project. The public transport capacity rationalization component does not pose technological difficulties but special attention will be paid to the scrapping techniques to be sure they comply with the norms set by the environmental management plan. One part of the bus retirement program is a pilot project to test various retirement methods and is intended to investigate some technical and financial options associated with vehicle retirement.

## **4. Institutional:**

### **4.1 Executing agencies:**

#### **World Bank - IDB loan and GEF Grant Executing Agencies**

The Borrower for the Loan will be the Municipality of Metropolitan Lima (MML) with a sovereign loan guarantee from the Government of Peru while the recipient for the GEF Grant is the Government of Peru. The Loan and the Grant will each have one executing agency: (i) PROTRANSPORTE for the Lima project and (ii) FONAM for the GEF project. For the Lima project, the procurement and supervision of civil works will be delegated to EMAPE, while the procurement of goods and consultant services will be done by PROTRANSPORTE. For the GEF grant, part of the procurement and supervision of civil works (bikeway network rehabilitation and extension) will be delegated to the Programa de Transporte No-Motorizado de la Municipalidad de Lima (see details in the procurement plans). The GEF sub-component aiming at mitigating the social impacts of the public transport supply rationalization component will be procured and supervised by PROTRANSPORTE together with the matching sub-component of the WB-IDB loan.

PROTRANSPORTE and FONAM will have the functions listed below expected for adequate administration, management and execution of the respective projects. Primary responsibility will be the coordination, monitoring and reporting functions as well as the project administrative support including processes related to budget, accounting, financial control, and contract signing. Among the specific responsibilities of PROTRANSPORTE are (i) preparing Annual Operation Program, (ii) supervising the institutional agreement with EMAPE for the execution of procurement and supervision of civil works, (iii) monitoring the execution of project activities by other beneficiary institutions, such as DMTU, DIGESA, Ministry of Labor and the Special Metropolitan Project for Non Motorized Transport (PEMTNM); (iv) maintaining project loan accounts as well preparing financial management reports; (v) managing payments and preparing disbursement requests; (vi) carrying out the contracting process in compliance with the Bank guidelines; (vii) ensure the operation and maintenance of works and equipment contracted under the project; (viii) contracting external auditors for conducting the loan proceeds audits; and (ix) prepare the quarterly progress reports which include a separate chapter which describes the financial and fiscal status of MML as well as the balance of the Fondo Fideicomiso.

The quarterly progress reports, which must include all components of the project, will be sent to the Bank and IDB within one month after the end of each quarter. The reports will describe: (i) progress achieved during the previous quarter in the implementation and in the achievement of the objectives based on the performance indicators; (ii) an assessment of the problems and issues derived from the implementation of the project; (iii) information on procurement processes and contract awards completed during the quarter; (iv) updated implementation and disbursement schedules for the following quarter; (v) status of compliance with the legal covenants contained in the Loan Agreement; and (vi) progress in executing previous recommendations.

Furthermore, each executing agency will enter into a formal agreement with beneficiary institutions defining the objectives, work programs, roles and responsibilities, resource requirements, flow of funds, expected results, and technical assistance required to achieve the objectives.

The executing agency for the GEF component (FONAM) will be in charge of coordination with other local or national agencies, such as municipal districts, ProTransporte, CONAM, SENATI, etc. Depending on the component, different project execution arrangements are being considered:

- support public transport capacity rationalization: this component will be co-implemented with FONAM and PROTRANSPORTE, the implementation unit of the Lima project. The establishment of the Guarantee Fund will be under FONAM's responsibility while the sub-component aiming at providing training and micro-credits to impacted bus operators will be merged with the corresponding component of the loan, and executed by PROTRANSPORTE. The bus scrapping pilot project will be executed by FONAM;
- consolidation and expansion of Lima bikeway network: this component will be carried out by FONAM and the NMT unit recently reestablished by the Municipality of Lima (Programa de Transporte No-Motorizado de la Municipalidad de Lima, PTNMML). FONAM will execute the works planned outside the municipality of Lima, i.e. in the municipality of Callao. The activities under the promotion campaign component will be executed by FONAM and PTNMML.
- institutional strengthening on sustainable transport, targeting municipalities and institutions dealing with environmental issues and/or transport planning: this component will be carried out by FONAM in coordination with the Secretaria Técnica del Consejo de Transporte de Lima y Callao and the institutions which will benefit from it;
- assessment and monitoring of the GEF project performance: this component will be carried out by FONAM.

#### 4.2 Project management:

PROTRANSPORTE will report to the Municipal steering committee for transport affairs, TRANSMET, chaired by the Municipal Director and integrated by the Executive Director of PROTRANSPORTE, the Municipal Director for Urban Transport (DMTU), the President of the Metropolitan Planning Institute (IMP), the General Manager of EMAPE, the President of the Metropolitan Investment Fund (INVERMET), and the President of the Autonomous Authority of the Electric Mass Transport System (AATE). The main functions of TRANSMET are: (i) to prepare and implement the General Transport Investment Plan for Metropolitan Lima; (ii) to coordinate transport activities of agencies involved in urban transport and supervise compliance with the abovementioned investment plan; (iii) to propose laws and regulations to rationalize and organize urban transport and to facilitate implementation of the approved investment plan; and (iv) to monitor and evaluate achievement of the objectives of the investment plan. As such, TRANSMET will be the principal accommodator for establishing the required regulatory framework to facilitate effective and efficient operation of the proposed project.

The executing agency PROTRANSPORTE is headed by an Executive Director and presently has 15 fulltime professional staff, divided over 3 departments: (i) Operations for technical aspects, (ii) Social for environmental and social aspects, and (iii) Administration and Finance. PROTRANSPORTE will receive technical assistance from EMAPE for the procurement and supervision of civil works, DMTU for implementing the route concessions, the Ministry of Health (DIGESA) for the strengthening of the air quality monitoring network, and PTNMML for implementation of bicycle facilities.

FONAM is responsible for the administration, execution, supervision, evaluation and monitoring of the GEF grant. FONAM will be working in coordination with a Consultative Committee integrated by the

Provincial Municipalities of Lima and of Callao, CONAM, the Ministry of Transport, the Comité del Aire Limpio para Lima y Callao and a representative of the distrital municipalities. This committee will be assisted by an advisory panel integrated by civil society members.

#### 4.3 Procurement issues:

World Bank staff undertook a preliminary procurement capacity assessment of PROTRANSPORTE, EMAPE and FONAM, the agencies responsible for procurement under the credit and GEF grant. None of these agencies have experience with Bank-financed projects, except to a certain extent FONAM which executed the PDF grant to prepare the GEF project, which gave them a preliminary knowledge of World Bank procedures related to the procurement of consultants. A full procurement capacity assessment was carried out during appraisal and included conclusions regarding procurement documentation, administration and staffing requirements for the aforementioned agencies. Procurement procedures and guidelines will be established in the Project Operational Manual agreed with IDB and the Bank before effectiveness of the credit. A draft Project Operational Manual will be presented before negotiations. The preliminary overall risk rating is High.

#### 4.4 Financial management issues:

**Overall Assessment:** In general, the proposed Financial Management Arrangements for the loan and grant are sound. However, both PIUs have been created specifically to respond to the project design and implementation needs and therefore have no experience with the execution of IBRD funds.

As a result of the individual assessments performed and the self – assessments which were prepared by each PIU, an extensive time-bound Financial Management (FM) action plan been agreed. Successful implementation of the action plan would result in adequate project FM arrangements in place by the effectiveness date.

**Risk Assessment:** Country specific risk has been assessed as *moderate* due to robust financial administration legislation, highly trained and dedicated staff in financial management posts and an integrated financial management system at national level. Entity specific risk has been assessed as *substantial*, due to the newness of institutional and organizational arrangements for the project and limited financial capacity of both institutions. Also counterpart funding could prove to be risky since changes of political commitment at the municipal level, in the case of PROTRANSPORTE, could influence the availability of counterpart funds and thus implementation. Control risk for both entities has been assessed as *substantial*, since key personnel including financial management and procurement staff have not been hired. Also, the PIUs are still in the process of analyzing available alternatives for the implementation of integrated information systems for each individual PIU.

Notwithstanding, successful completion of the FM Action Plan prior to effectiveness would result in an entity specific and control risk rating of *moderate* and in financial management arrangements which meet minimum Bank Requirements.

Both PROTRANSPORTE and FONAM will have accounts audited every fiscal year by independent auditors in accordance with the Bank guidelines and international standards of auditing. The reports of



such audits will be submitted to the IDB and the Bank no later than six months after the end of the Borrower's fiscal year.

## **5. Environmental:** Environmental Category: B (Partial Assessment)

5.1 Summarize the steps undertaken for environmental assessment and EMP preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

The project is expected to positively affect the local and global environment through rationalization of key bus routes and traffic corridors, retirement of highly-polluting vehicles, improvements in traffic safety and upgrades to the urban environment throughout the city. First of all, the project will contribute to reductions in air pollution which will have a direct positive affect on public health. In 1998, more than 90% of medical admissions of children under 5 was due to respiratory infections, many of which can be attributed to air pollution and specifically to transport sector emissions. Secondly, the project will result in a reduction in GHG and more specifically in CO2 emissions. Recent trends in Lima show an increase in used vehicle imports, a significant increase in the taxi and small bus fleets, and a reduction in the public transport modal share. Thirdly, the project seeks to remedy many of the unsafe traffic patterns plaguing the city by redesigning key traffic nodes through rationalizing public transport routes and enforcing route concessions, improving flow patterns, and restricting illegal public transport along the corridor. Finally, the project contemplates many urban upgrades to improve areas surrounding the bus corridor, including commercial improvements, green spaces, architectural face-lifts, and enhanced protection of existing protected areas affected by the project.

### Strategic EA

The SEA seeks to orient the environmental management of the program as a whole during the planning, construction and operational phases. The SEA analyzed the socio-political, regulatory and institutional frameworks and evaluated the potential economic, social, environmental and territorial implications of the program. Based on a detailed diagnostic at both the regional and specific levels, an integrated analysis was done based on alternative scenarios. A round of public consultation was held, including focus groups and in-depth interviews. Finally, the SEA presents a Management System for Environmental Management.

The SEA analyzed the following impacts, benefits and risks of the program:

- Alteration of land use in both urban and rural areas;
- Improvements to the competitiveness and economic efficiency of the city;
- Reduction in transport costs and impacts on external economies;
- Improvements in the quality of service and culture of transport;
- Involuntary displacement of businesses and people;
- Reduction in urban pollution;
- Improvements in public perception of the urban environment;
- Institutional and legal framework inadequacies; and,
- Strengthening of the urban transport system.

### Corridor-specific EIA

Specific impacts related to the dedicated bus lanes were addressed through a site-specific Environmental Impact Assessment. The EIA presents an analysis of impacts related to the design of the corridor, and those caused from construction and operation. The EIA presents an EMP with specific programs to mitigate impacts.

#### *Environmental impacts*

Most of the environmental impacts which were identified in the EIA are due to the construction phase of the project. These include increased levels of air, soil water and noise pollution, limitations on traffic circulation, interruptions in services, harm to existing green areas, and others.

Possible impacts during operation include air, noise, soil and water contamination from the terminals and parking/maintenance areas, increased pressure on the protected area Pantanos de Villa, and increased accidents due to improper design.

Environmental benefits predicted by the EIA include a rationalization of the 'collective' transport system, a decrease in travel time, and the reduction of air and noise pollution.

#### *Social impacts*

The EIA identifies the main social impacts as those related to employment and social security. The impact on displacement and/or reduction of informal commerce is discussed.

Social benefits outlined in the EA include improved comfort and security for passengers, generation of employment during construction and operation, a new culture related to transport, and a new participatory civic culture.

### Impacts on cultural heritage

The only archeological site proximate to the corridor is the Pampa Cueva, located at the intersection of Avenida Tupac Amaru and Avenida Las Americas. The culturally historical centers of both Lima and Barranco-Chorillos affected by the project are legally protected by the National Cultural Institute. The EIA does not predict that construction or operation to have a negative impact on any of these sites.

### Environmental guidelines for bus scrapping

These guidelines were developed to ensure that the vehicle scrapping program is implemented in an environmentally-friendly manner, guaranteeing proper disintegration of the buses, reuse/rehabilitation of parts and final disposal.

#### *Environmental impacts*

Impacts possible from the physical scrapping of the buses include ground and water contamination from improper handling and disposal of liquid and solid wastes, including parts containing hazardous materials such as heavy metals, and improper management of recycling operations. Public safety could be affected should defective parts be allowed to re-enter the market after scrapping.

## 5.2 What are the main features of the EMP and are they adequate?

The project integrates environmental aspects throughout all components. Special urban renewal projects are considered for the areas of Caqueta, the historical centers of Lima and Barranco, and support to the



Pantanos de Villa project.

A matrix with all the activities considered in the EMP, including the recommendations from the SEA and EIA, the amounts for implementation of the various mitigation programs, institutional responsibilities, and timing is presented in Annex 11. These activities address all of the identified environmental and social impacts.

The possible environmental impacts from bus scrapping are addressed in the Guidelines. Following the established guidelines and proper operational safety measures for workers will be a requirement of the concession. Audits of the scrapping, recycling and disposal operators will be done at an appropriate interval to be determined.

Architectural and engineering designs of the project will include specific measures for disabled persons. Some of the important measures foreseen include: i) adequate dimensions of sidewalks for wheelchair access; ii) special signage indicating disabled access; iii) access ramps of no more than 8%; iv) in the case of elevated bus stops, elevators; v) all pedestrian bridges will include or be retrofitted with access ramps; vi) at the terminals, if bathrooms are included in the final design, special stalls will be installed; and v) measures for deaf and blind passengers including sounds indicating oncoming buses, a contrasting color scheme, and textured surfaces.

### 5.3 For Category A and B projects, timeline and status of EA:

Date of receipt of final draft: Strategic EA, May 19, 2003

Corridor EIA, May 22, 2003

The Strategic Environmental Assessment was submitted to the Bank on May 19, 2003. Revisions are being made based on comments provided by the banks and PROTRANSPORTE. A final draft of the environmental management plan was submitted on May 23, 2003.

The final draft of the corridor-specific Environmental Impact Assessment was submitted to the Bank on May 22, 2003.

### 5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?

The SEA was consulted via focal groups and in-depth interviews with stakeholders. Focus groups included users of the transport routes and operators. People were interviewed from various agencies to understand opinions, perceptions and thoughts about public transport and possible civil society involvement during implementation of the program. Details of the consultations are in project files. The executive summary of the SEA will be put on the PROTRANSPORTE website.

The EIA was consulted in various workshops during its elaboration. The EIA is available on the website of PROTRANSPORTE ([www.protransporte.org.pe](http://www.protransporte.org.pe)). To date, more than 240 hits have occurred to download the comments, and more than 45 CDs with the website have been distributed to interested parties. Comments have primarily been minor and non-substantive. Records of the public consultation are available in project files.

The Guidelines for bus scrapping were discussed in workshops in November 2002, where stakeholders from many areas were present. Details of these meetings, including attendance lists, are available at

FONAM. The Guidelines were posted on the website of FONAM ([www.fonamperu.org](http://www.fonamperu.org)).

This summary environmental annex will be posted on the INFOSHOP of the World Bank prior to appraisal to fulfill the disclosure requirements.

#### 5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?

While all activities that are part of the EMP are important to ensure the sustainability of the project, certain key activities in the EMP have strict deadlines to ensure their implementation in a timely manner as per national law and Bank policies:

- procedures for chance finds to be developed prior to opening of any bid for works;
- construction manual with environmental specifications approved by the Bank prior to opening of any bid
- for works (this will be part of the standard bidding documents that the Bank will approve);
- Pantanos program designed and implementation begun prior to contract signing for southern portion of corridor;
- mitigation of operators plan approved before opening of the concession bidding process. The plan must have chronogram where all affected people are taken care of before start of operation of corridors;
- mitigation of informal commerce plan approved before opening of the bidding process for the works. The plan must have chronogram where all affected people taken care of before signing of contract; and,
- resettlement plan final design must be finished and negotiated with all affected people prior to opening of bidding process for that segment of the corridor, everyone must moved before signing the contract for works.

PROTRANSPORTE will be the key agency responsible for monitoring the implementation of the EMP. A department responsible for EMP implementation and monitoring will be included in the implementing agency, with appropriate competencies.

An independent auditor will supervise the implementation of the EMP, reporting directly to the Banks three times a year. The auditor will monitor all aspects of the EMP.

The project will partially finance the design and placement of an air quality monitoring network in the area of influence of the project. To support this effort, the project will also finance a study on the environmental baseline prior to initiation of the works, an inventory of the emissions from the vehicle fleet, and a consolidation of historical data on air quality.

A beneficiary impact assessment, to be undertaken during implementation, will develop an integrated strategy to identify and address social impacts of the proposed project in the project influence areas and to develop a framework to incorporate participation of various categories of stakeholders during various

stages of the project cycle.

## **6. Social:**

**6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.**

The project seeks to contribute to the development of the Metropolitan area through development of an integrated transport system that improves the quality of life of the population. These quality of life improvements are expected from improved socio-economic changes, mobility, environment, security (road and civic), and competitiveness of the city. The bus corridors will connect low income areas in the north and south with the city center. The poorest segment of the population is expected to directly benefit from the project, as they are most impacted by deficient public transport, environmental degradation and economic problems.

Main social issues arising from the implementation of the project are resettlement of the Mercado de Flores (72 people) and the economic impact on operators and formal and informal commerce along the corridor. These issues were specifically addressed in special studies during project preparation. A resettlement plan is proposed for the Mercado de Flores. A training and outreach program is planned for the operators and other affected populations. These activities are further described in Annex 11.

**6.2 Participatory Approach: How are key stakeholders participating in the project?**

During preparation, information has been shared and consultations have been carried out among all categories of stakeholders through structured interviews, semi structured interviews, focus group discussions and stakeholder workshops.

During implementation, collaboration with civil society and NGOs, participation of all categories of stakeholders will be facilitated by sharing information and consultation through periodic workshops and focus group discussions. In addition, engendered report cards will be implemented to ensure public's views regarding the quality, efficiency, and adequacy of the Lima transport project are continuously addressed.

Stakeholders who have been involved in project preparation include bus owners, private transport associations, local government, NGOs (Ciclored, CIDATT) and central government officials. The social program will ensure that all affected populations are adequately dealt with. Different workshops have been conducted to shape the final proposal and to involve the transport sector in the decision-making. To understand the opinions and the feelings vis-à-vis a change in the public transport sector and the vehicle retirement program, a specialized company carried out two focus groups with drivers of combis and buses.

### **GEF project : Workshops and Presentations**

- May 13, 2002 : Presentation in presence of PROTRANSPORTE. Technical proposal: Design of a financial incentive scheme to promote to promote public transport capacity rationalization
- May-July 2002 : Focus Groups on bike use with workers, cyclists, students, women, bus drivers, inhabitants of the zones served by the bikeways, etc.
- July, 10, 2002 : First workshop with representatives of private operators in the public transport sector and governmental institutions : design of a financial incentive scheme to promote public transport capacity rationalization.
- July,16, 2002, FONAM workshop: Presentation of the preliminary results of the focus groups with current drivers and owners.

- July, 08, 2002 : first presentation to the Peru GEF project Consultative Committee of the financial incentive scheme to promote public transport capacity rationalization and of the bus physical retirement process
- July-September 2002 : continuous consultative process with the municipal districts and other beneficiaries of the institutional strengthening component to assess the needs and design the training program.
- August, 21, 2002 : second workshop with representatives of private operators in the public transport sector and governmental institutions on the design of a financial incentive scheme to promote public transport capacity rationalization
- August, 27, 2002 : second presentation to the Peru GEF project Consultative Committee of the financial incentive scheme to promote public transport capacity rationalization and of the physical retirement process
- October 2002 : focus groups with more than 700 bus drivers, owners and conductors on the bus retirement scheme and their expectations vis-à-vis the social impacts mitigation program.
- October, 28, 2002 : proposal of incentives to promote the removal of old obsolete vehicles - FONAM
- November, 2002 : workshops with the municipal districts served by the bikeways on bike use promotion.
- November 8, 2002 : presentation of the expected environmental benefits to the GEF project Committee
- December, 10, 2002 : last presentation to stakeholders about the design of a financial incentive scheme to promote public transport capacity rationalization - FONAM
- April 9, 2003 International Seminar on the GEF aspects and sustainable transport to raise awareness among national and local decision makers to secure support to the project
- July, 2003 : Seminar to discuss the findings of the GEF preparatory studies at the technical and at the citizenry level.
- September 16-17 : three-fold event, targeting municipal technical teams and policy-makers (231 participants), transit workers and operators (829 participants) and the citizenry (496 participants) to discuss the GEF project design, and sustainable transport in general.

The monitoring and evaluation system will be based in a systematic consultation with the users of the corridor. The project has established channels of communication with the users. Linkages have been established with various government agencies to ensure cooperation between different programs.

### 6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

The environmental impact assessments were consulted broadly, including with local NGOs. The program for mitigation of the impacts on operators will likely be led by an NGO. Two NGOs (Ciclored and CIDATT) were members of the GEF project Consultative Committee.

### 6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

Under the institutional development component, many activities are foreseen to build the capacity of the PMU, concessionaire, government and others. In the specific case of the informal and formal commerce along the corridor, the project will build capacity within the existing department of commerce. The program to re-train the operators will be done through agreements with the Ministry of Labor, tapping into

existing programs. This program will also work through state and private agencies. The exact mechanisms for the links are being decided.

#### 6.5 How will the project monitor performance in terms of social development outcomes?

The project will finance the design and implementation of a monitoring and evaluation system for users of the transport system, as well as the baseline study thereof. Details of the monitoring system, including the objectives and methodology, can be found in Annex 11.

### 7. Safeguard Policies:

#### 7.1 Are any of the following safeguard policies triggered by the project?

Policy	Triggered
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Natural Habitats (OP 4.04, BP 4.04, GP 4.04)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Forestry (OP 4.36, GP 4.36)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Pest Management (OP 4.09)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Cultural Property (OPN 11.03)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Indigenous Peoples (OD 4.20)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Safety of Dams (OP 4.37, BP 4.37)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)*	<input type="radio"/> Yes <input checked="" type="radio"/> No

#### 7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

##### *O.P. 4.01 – Environmental Assessment*

The policy is triggered due to the potential environmental impacts of the project. Numerous environmental analyses were completed during project preparation to ensure proper handling of potential negative impacts, and to ensure that potential environmental benefits are capitalized upon. As described above, the SEA takes a broad, regional approach to the program as a whole. The EIA studied the environmental impacts of construction of the corridor. Operational guidelines for bus scrapping were developed to ensure proper environmental management of this component. The EMP is a combination of the recommendations from these studies. In addition to the required mitigation measures, many environmental activities are integrated into the project.

##### *O.P. 4.04 – Natural Habitats*

This policy is triggered due to the situation of the southern terminal near the edge of an existing protected area, Pantanos de Villa. The wetlands will not be directly affected by the project, but an indirect impact could be increased pressure from easier access due to public transport and higher volume of private transport that is going to the terminal. A program is included in the EMP to support the master plan of the park, under implementation since 1998. Activities foreseen include reinforcing the surrounding perimeter, building walkways, better signage and others.

##### *O.P.N. 11.03 – Cultural Property*

The corridor-specific EIA analyzed the impact that the project would have on cultural heritage of Lima and determined that no sites are affected. A program is included in the EMP that provides for protection of existing cultural heritage and procedures for chance finds. All procedures that will be included in the program will follow criteria set by the National Institute of Culture.

##### *O.P. 4.12 – Involuntary Resettlement*

The project has developed an abbreviated resettlement plan for the 72 businesses located in the Flower Market that will be moved due to construction of the terminal. The plan establishes: the number and socio-economic condition of the current businesses, the new area where the stalls will be relocated (the area is adjacent to the current area) and a proposed design of the new market, the procedure for assigning the new stalls, the consultation process for gaining agreement on the final design from the businesses, and possible compensation of lost income during construction. The plan is included in the social impact annex.

The EIA established, and the SEA confirmed, that the initial phase of COSAC will not cause any other involuntary resettlement as the construction is along existing roadways. While not considered involuntary resettlement, the project has addressed negative social impacts on groups whose income will be affected by the project, namely informal and formal businesses along the corridor and bus operators.

A special study was completed to assess the impact on informal and formal businesses along the corridor. This study proposes an extensive plan to mitigate impacts on these businesses. The plan includes relocation, training, and compensation. A summary of the report is included in the social annex.

Another special study was completed to assess the impact on operators of loss of income due to the elimination of their bus routes and scrapping of their buses. A plan is proposed for re-training for other jobs within the transport sector, and a small fund for microcredits will be established to mitigate the impacts.

## **F. Sustainability and Risks**

### **1. Sustainability:**

- a. The project serves as a pilot project in Metropolitan Lima to create behavioral changes in people's mobility patterns, and therefore a strategy will be developed for dissemination at regional/global level, using electronic knowledge transfer instruments (CD ROM, Website, etc.), international conferences, cooperation with national and international NGO's, workshops, etc.
- b. The sustainability of the program is expected to be guaranteed through the high level of local government commitment, the broad civil society support and the participation and support of formal private bus companies that are motivated by the rationalization and improved enforcement of public transport supply. It is expected that this will eradicate unfair and predatory competition, increase ridership and farebox revenues and reduce operating costs. Rationalization of public transport supply will be achieved through various measures described before, including the concessioning of bus routes on the separated bus corridors and feeder routes. This will make the formal public transport operations more profitable, inducing private sector investment in the sector and strengthening the public private partnerships in bus operations.
- c. The strengthening of the local authorities will facilitate the rationalization of public transport operations, the regulation of public transport operations, the enforcement of concessioned routes and the elimination of informal operations on these routes. The emphasis on better coordination within and outside the local government structure is expected to result in a more comprehensive urban transport planning, embedded in a metropolitan development strategy.
- d. The project emphasis on improving access to and within poor neighborhoods combined with automotive air pollution mitigation measures is expected to improve the quality of life within the affected neighborhoods by improving mobility for vulnerable road users, improving road safety and reducing air pollution.

The GEF components sustainability depends on three conditions:

- **Early involvement and strengthening of the municipalities**

Since the beginning and the preparation phase, this project has been in touch with municipal districts and provincial municipalities to make sure they would be involved in the definition of the components



that they will benefit from. The strategy to be used will be to initiate the execution of the project through FONAM, in co-management with the municipalities and progressively to let the municipalities responsible for the next implementation stages regarding the NMT component. In parallel, the institutional strengthening component will provide those municipalities with the technical capacities required to take over in a satisfactory and sustainable way the programs promoted by the GEF project when the project closes.

- **Civil Society Involvement**

Sine qua non conditions for this project to be successful include ownership and commitment to its goals at the citizenry level. The preparation phase of the project included several focus groups, in-depth interviews, etc. Then, during the project implementation period, local stakeholders will continue to be closely involved. Once the citizenry has changed its attitude vis-à-vis NMT and assimilated its advantages regarding air quality, the creation of citizens committees will be encouraged to keep reminding the municipalities that their constituents expect them to promote NMT.

- **Communication, Outreach and Advocacy actions.**

During project implementation, communication programs will target a variety of high-level actors (municipal authorities, local community leaders, the Church, local employers, etc.). in order to build support to the program at the decision makers level. Targeting executives and public authorities should raise the likelihood that the GEF-promoted actions will be replicated in some other parts of Metropolitan Lima and Peru.

### **1a. Replicability:**

Segregated busways and public transport capacity rationalization has an enormous potential for replication in other cities of Latin America, Africa, Eastern Europe and Asia. Many of these cities suffer from a chaotic public transport system, clogged by an oversupply of transport vehicles that is due basically to the same reasons as in Lima. Some cities like Bogotá have already implemented segregated busways which has proved to be an overwhelming success. This project, if successful, will offer to many other cities which are now looking at options inspired by Transmilenio, an example of how to implement segregated busways and complement them with a socially fair and optimized vehicle retirement scheme. During presentations at the Transport Research Board (Jan 12-16, 2003) and in the Bogotá seminar on Human Mobility (February 6-9, 2003), the concept to be developed under this project raised a lot of interest from representatives of other cities from Latin America, who understand the necessity of tackling the problem of low-quality public transport services engulfed in dramatic oversupply, but who are reluctant to act because of the complexity of the issue. This shows that this experience will be of high interest as an inspiration to other cities faced with the same problem.

The inclusion of a nonmotorized transport component to promote the use of low cost transport alternatives has a large replication potential in Latin America where many bike advocacy groups are in the process of lobbying municipalities so that they start thinking about the possibilities offered by non-motorized transport. The successful example of Bogotá's bikeways is looked at as a best-practice case and is attracting more and more visitors from municipalities all around Latin America. Through two operations currently under preparation (this one and the Santiago's Transport and Air Quality), the GEF will offer to those municipalities interested in following Bogotá's steps, two very interesting pilot projects with two different, but complementary approaches : (i) in Lima, the project aims at providing NMT facilities mainly to low-income neighborhoods (except in Avenida Arequipa where users are expected to be better-off) and to address the needs of citizens who might be interested in using bicycles for financial reasons; (ii) in



Santiago, the objective is to create an attractive network of bikeways in relatively trendy and wealthy neighborhoods, in order to target the upper classes which are more likely to generate a cultural change and to change the image of the bicycle which in many places is still viewed as the transport mode of the poor. Thanks to these two projects which to a certain extent will turn Santiago and Lima into “NMT laboratories”, decision makers all around Latin America will be offered two experiments to look at, based on different philosophies but sharing some basic principles as the acknowledgement that communication campaigns have to accompany infrastructure building. This should guide them in their own projects and help them to fine-tune their approach of NMT for their cities and to respond better to the growing demand for NMT facilities currently witnessed all over Latin America. Probably the most promising factor as far as replicability is concerned lies in the seminar held on September 16-17 where mayors and representatives of Peruvian secondary cities were presented the GEF project and its NMT and public transport components. In this opportunity, several of those mayors expressed their will to follow the same steps as Lima (Chiclayo, Trujillo, Arequipa, Cuzco, Iquitos, Ferreñafe).

## **2. Critical Risks** (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

- a. The proposed project requires well-functioning institutions at a time when many responsibilities are being decentralized from the national to the local level. MML thus faces many new challenges, and its agencies, particularly the recently created PROTRANSPORTE, will take time to become established. Moreover, future phases of the busway system must involve Lima’s sister city Callao, which accounts for about 10% of the metropolitan population but which is not currently included the program. The project thus places great emphasis on the aspects of institutional strengthening and training of technical staff, such as traffic engineers and traffic police, and will support the development of mechanisms aimed at improving inter-municipal coordination.
- b. Counterpart funding could prove a risk from two aspects. Firstly, the Municipality of Lima has limited financial capacity. Secondly, changes in political commitment at the municipal level could influence the availability of counterpart funds and thus implementation. For this too, it is important that intra-governmental relations be strengthened, including the roles and responsibilities of central and local governments, the process of decentralization, and the overall fiscal relations between the central government, Provincial Municipality, and District Municipalities of Lima-Callao.
- c. There are policy risks; it is accepted that lack of realistic tariffs will contribute to (i) a decline in the public transport fleet/supply and (ii) costly subsidies to urban transport by government. It is imperative that the integrated fare system be implemented so that the poor, for whose benefit this project is targeted, do not have to spend increased portions of their income on changing buses more than one time in order to travel on origin-destinations not served by a single bus route. Fare collection must be done pre-boarding and for this, users and operators have to be imparted basic training in the procedures in order to ensure quick and efficient service.
- d. The outcome of GEF component raiming at rationalizing public transport supply depends on the regulatory framework of the urban transport sector in Lima and whether licenses to operate public transport vehicles are awarded in a rationale way which prevents the current oversized fleet from continuing to grow. The Municipality is committed to adopt a public transport policy that will address the oversupply issue, control the bus fleet both qualitatively and quantitatively, and make sure that these new rules are enforced. A study has been contracted to help Lima define their urban transport strategy. At the time of negotiations, a draft was available but the final report had not been approved yet, so the Municipality could not issue a letter outlining the guidelines of their policy regarding road-based public transport. It was agreed during negotiations that the issuance of

such letter, to be approved by the Bank, is a condition for disbursement under the public transport fleet rationalization components of the GEF project (Schedule I) and is a dated covenant under the loan agreement, to be complied within six months after effectiveness. In addition and as mentioned in Article V of the grant agreement (remedies of the Bank), the Bank will have the right to terminate the grant agreement if the related policy is “amended, suspended, abrogated, repealed or waived so as, in the opinion of the Bank, to affect materially and adversely the ability of the Recipient to perform any of its obligations under the GEF Trust Fund Grant”. To end with, the Bank will have to give its no-objection to the specific interinstitutional agreement between Protransporte and FONAM whereby Protransporte will specify how they will implement the bus retirement strategy that is supported by the GEF. It is worth mentioning here that the imports of second-hand vehicles that have been flooding the streets of Lima has been suspended through the “decreto de urgencia 079-2000”. In addition, the public transport fleet has been already frozen through the “decreto supreme de urgencia 025-200-MTC”.

In view of the considerations outlined, the risks are expected to be manageable. Offsetting these risks are the benefits expected from the project and particularly from its institutional strengthening components. If these components are successful, the benefits in terms of improved resource allocation would go well beyond the direct benefits estimated.

<b>Risk</b>	<b>Risk Rating</b>	<b>Risk Mitigation Measure</b>
<b>From Outputs to Objective</b> The local authorities and institutions responsible for regulating public transport operations have insufficient institutional capacity to implement the project.	S	Assist the recently elected local authorities with institutional strengthening, training programs for technical staff, traffic planners and traffic police, and include technical assistance and training to affected municipalities in a climate of decentralization of responsibilities.
Inter-institutional and intra-governmental cooperation does not continue throughout the project.	M	Inter-institutional and intra-governmental relations strengthening to maintain the actual commitment and secure the availability of local counterpart funds as well as adequate annual disbursements.
The current bus-operators do not accept the relocation of their work routes and the rationalization of the transport system.	M	Demonstrate win-win situation by providing basic training and technical assistance in business administration to displaced operators in order to optimize revenues and service provision.
Unrest among (informal) operators forced to leave the sector because of route rationalization and stricter enforcement.	S	Develop impact mitigation programs for operators and other affected personnel leaving the profession.
The benefits of the vehicle retirement component are offset by the continuous entry of additional public transport vehicles	M	Commit the Municipality of Lima to coordinate with the other provincial municipalities with regards to route licensing, to freeze the number of licenses and to enforce Inspection and Maintenance standards
<b>From Components to Outputs</b> · Lack of continuity in PROTRANSPORTE management.	N	· Strong private sector participation expected to ensure the implementation of the operational aspects of the project and the operation by reliable and qualified private operators.
· Changes in commitment to project implementation at the municipal level.	N	· Implementation of efficient and effective institutional structure and strengthening of fiscal capacity to improve MML's financial sustainability.
· Weak client commitment to and participation in implementation.	N	· Strong program ownership and active participation to protect and care for the system.
<b>Overall Risk Rating</b>	M	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N(Negligible or Low Risk)

### 3. Possible Controversial Aspects:

## **G. Main Conditions**

### **1. Effectiveness Condition**

Satisfactory Implementation of the Financial Management Action Plan

### **2. Other** [classify according to covenant types used in the Legal Agreements.]

#### ***Financial Covenants :***

**Section 4.01** "Standard" wording for project audits. The annual audit reports would be furnished to the Bank not later than six months after the end of each year.

**Section 4.02** "Standard" wording for FMRs. The semi-annual FMRs would be submitted to the Bank by each individual PIU, not later than 45 days after the end of each six month period.

## **H. Readiness for Implementation**

- 1. a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation.
- 1. b) Not applicable.
- 2. The procurement documents for the first year's activities are complete and ready for the start of project implementation.
- 3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
- 4. The following items are lacking and are discussed under loan conditions (Section G):

## **I. Compliance with Bank Policies**

- 1. This project complies with all applicable Bank policies.
- 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies.

---

Paulus A. Guitink  
**Team Leader**

---

Danny M. Leipziger  
**Sector Manager/Director**

---

Marcelo Giugale  
**Country Manager/Director**

**Annex 1: Project Design Summary**  
**PERU: LIMA TRANSPORT**

<b>Hierarchy of Objectives</b>	<b>Key Performance Indicators</b>	<b>Data Collection Strategy</b>	<b>Critical Assumptions</b>
<p><b>Sector-related CAS Goal:</b></p> <ul style="list-style-type: none"> <li>● Financing investment programs which have a direct impact on the productive lives of the poor, through a combination of rural and urban development programs; and support the institution of reforms in social sectors.</li> <li>● Renewed focus on environmental issues especially as linked to health, sustainable use of natural resources, and management of biodiversity.</li> </ul>	<p><b>Sector Indicators:</b></p> <ul style="list-style-type: none"> <li>● Increase in well-being of the people in the project area, especially the poor.</li> </ul>	<p><b>Sector/ country reports:</b></p> <ul style="list-style-type: none"> <li>● Impact Evaluation and Bank reports</li> <li>● Sector Reports</li> </ul>	<p><b>(from Goal to Bank Mission)</b></p> <ul style="list-style-type: none"> <li>● Effective policy dialogue and project execution supported by stable macroeconomic situation in the country.</li> <li>● continued central government support for local government urban development initiatives</li> </ul>

<p><b>GEF Operational Program:</b></p> <p>OP11: to facilitate greenhouse gases reduction from ground transport in Lima.</p>	<p><b>Outcome / Impact Indicators:</b></p> <p>Reduction of CO2 emissions from the transport sector compared with the baseline.</p>	<ul style="list-style-type: none"> <li>● GHG emissions inventory</li> <li>● Transport plans and reports</li> </ul>	<p>Government remains committed to promoting the adoption of sustainable (low-GHG emitting) transport options</p>
<p><b>Project Development Objective:</b></p> <p>Enhance the economic productivity and the quality of life within the Lima Metropolitan area through improving mobility and accessibility for the metropolitan population, especially in the peri-urban poor neighborhoods by establishing an efficient, reliable, cleaner and safer mass rapid transit system.</p>	<p><b>Outcome / Impact Indicators:</b></p> <ul style="list-style-type: none"> <li>● % of low-income population benefited by the project, especially the low-income population living in peri-urban areas.</li> <li>● Increased level of urban transport users satisfaction along the corridors.</li> <li>● Consolidated Lima urban transport sector by improving planning, supervision &amp; control and management capacity of the participating institutions.</li> </ul>	<p><b>Project reports:</b></p> <ul style="list-style-type: none"> <li>● A representative sample of Project beneficiaries stratified by income segment, gender, geographical location, and compared with a baseline control group to be established during Project Implementation.</li> <li>● Travel time and satisfaction surveys on project corridors at project inception and one year after works completion.</li> <li>● Supervision Mission, Mid-Term Review and ICR missions.</li> </ul>	<p><b>(from Objective to Goal)</b></p> <ul style="list-style-type: none"> <li>● The Municipality implements dependable and sustainable mechanisms to honor its commitment to repay.</li> <li>● Inter-institutional coordination continues throughout the project.</li> </ul>

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<p><b>Output from each Component:</b></p> <ul style="list-style-type: none"> <li>● High capacity segregated bus corridors, feeder bus roads, bicycle paths and pedestrian facilities implemented and operating.</li> <li>● Enhanced transport and environmental conditions through improved traffic safety and reduced air pollution.</li> <li>● The Municipality of Lima's institutions responsible for planning, regulating, administrating and operating of public transport in Lima have been strengthened.</li> </ul>	<p><b>Output Indicators:</b></p> <ul style="list-style-type: none"> <li>● Reduced travel times experienced by public transport users on project bus corridors.</li> <li>● Reduced vehicle operating costs in bus corridors.</li> <li>● Increased bicycle use.</li> <li>● Reduction in fatal accidents in influence area of the project.</li> <li>● Establishment of integrated feeder routes and feeder route tariffs.</li> <li>● Reduction in air pollution in project area and in CO2 emissions from the transport sector compared with the baseline.</li> <li>● Vehicle emission criteria included in the vehicle inspection system.</li> <li>● Reduction of the public transport fleet operating in the areas affected by the project and at the metropolitan Lima level (At least 250 aged and polluting public transport vehicles retired by the 4th year of project implementation through the GEF-funded Guarantee Fund).</li> <li>● Improved capacity of units responsible for management of the transportation system</li> </ul>	<p><b>Project reports:</b></p> <ul style="list-style-type: none"> <li>● PROTRANSPORTE monitoring data on mobility patterns, travel time/costs and other specific surveys.</li> <li>● Report from Police and Traffic Safety Council.</li> <li>● Origin-Destination surveys.</li> <li>● CONAM's yearly reports.</li> <li>● Field measurements of air quality with future WB-IDB funded monitoring stations</li> <li>● Ex-post assessment of CO2 emission reductions based on diesel/gasoline combustion from the public transport sector.</li> <li>● Report of the number of bus retirement certificates emitted</li> </ul>	<p><b>(from Outputs to Objective)</b></p> <ul style="list-style-type: none"> <li>● The timing of investments and reforms is carefully planned and executed.</li> <li>● The fare proposed is compatible with the income level of the population.</li> <li>● Citizens participate actively in the project, assuring ownership for the system.</li> <li>● Design of adequate concession packages and restructuring of existing small and micro bus operating businesses into bigger formal companies.</li> <li>● Favorable National Regulatory Framework (especially regarding used vehicle imports and how bus routes are awarded)</li> <li>● Those displaced by the project are willing to participate in the mitigation plan and to receive technical and economic support.</li> </ul>

	(for supervision, tariff collection, payments) and traffic (police) in the newly created and operating corridors.		
<p><i>A. Mobility and environmental improvements</i></p> <ul style="list-style-type: none"> <li>● A.1. Construction of segregated bus corridors, terminals and bus stops</li> <li>● A.2. Feeder bus roads</li> <li>● A.3. Constuction of bike paths</li> <li>● A.4. Traffic Safety</li> <li>● A.5. Rationalization of urban road space consumption, through priority given to public transport over private transport.</li> </ul>	<ul style="list-style-type: none"> <li>● 28 km. of segregated bus corridors, 4 terminals, 2 workshops and bus stops.</li> <li>● Feeder roads rehabilitated</li> <li>● bike paths network rehabilitated and expanded.</li> <li>● Signals and demarcation lines through the newly bus corridors</li> </ul>	<ul style="list-style-type: none"> <li>● Monitoring system of PROTRANSPORTE Management Unit and DMTU periodic reports and Mission Supervision Reports.</li> </ul>	<ul style="list-style-type: none"> <li>● The existence of reliable and qualified private operators.</li> <li>● The Project is completed in the next 4 years.</li> <li>● Constant commitment from municipal authorities to non-motorized transport</li> </ul>
<p><i>B. Social mitigation and community participation</i></p> <ul style="list-style-type: none"> <li>● Social mitigation programs for affected operators and other groups.</li> <li>● Traffic safety awareness enhancing campaigns</li> <li>● Consultation with public transport users and operators on performance of the system</li> <li>● Information campaigns and participatory process targeting</li> </ul>	<ul style="list-style-type: none"> <li>● Training of not less than 4500 persons (bus drivers, bus owners) affected by the bus retirement program to facilitate their reintegration in the job market. <ul style="list-style-type: none"> <li>● 3,200 training and technical assistance vouchers supplied to displaced transportation workers.</li> <li>● By the 4th year, 80 courses realized, 400 people have received technical training, 50</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Project Reports</li> <li>● Bi-annual users satisfaction surveys</li> <li>● Monitoring component of the GEF project</li> </ul>	<ul style="list-style-type: none"> <li>● The existence of technical, financial and human resources to support the Program.</li> <li>● The citizens take ownership of the new system and remain patient during the inconvenience of construction.</li> <li>● The management procedures and the institutional capability help to the execution of the Program.</li> <li>● The operators accept the relocation of their work routes and the rationalization of the</li> </ul>



<p>current bus operators</p> <p><i>C. Institutional Strengthening</i></p> <ul style="list-style-type: none"> <li>● Implementation of the legal and institutional framework to restructure urban transport.</li> <li>● Provision of technical assistance, training programs and high quality development.</li> <li>● Unification and coordination of the functions with PROTRANSPORTE and DMTU.</li> </ul>	<p>micro-enterprises are granted financial support through micro-credits</p> <ul style="list-style-type: none"> <li>● PROTRANSPORTE, DMTU, EMAPE and PMETNM benefit from the institutional strengthening component</li> <li>● 11 local governments and FONAM have strengthened their capacities</li> <li>● 500 people among local authorities, civil servants, community leaders, civil society groups and general population are informed about sustainable transport options and their effect on air quality, GHG emissions and the environment in general</li> <li>● Number of men-hours of technical assistance per year.</li> </ul>	<ul style="list-style-type: none"> <li>● Project management Reports</li> </ul>	<p>transport system.</p>
<p><i>D. Studies and construction supervision</i></p> <ul style="list-style-type: none"> <li>● High quality supervision of civil works</li> <li>● Monitoring of poverty impact of new public transport system</li> </ul>	<p>Supervision contracts for civil works awarded</p> <p>Bi-annual user assessment and continuous surveys in poor neighborhoods</p>	<p>Project reports</p> <p>User surveys and poverty assessments</p>	<p>EMAPE has the institutional capacity for contracting supervision</p>

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<p><b>Project Components / Sub-components:</b></p> <ul style="list-style-type: none"> <li>● Improve mobility</li> <li>● Social mitigation and community participation</li> <li>● Institutional Strengthening</li> <li>● Studies and Works Supervision</li> <li>● Project Administration</li> <li>● Financial costs</li> <li>● Grade Separation at Plaza Grau</li> <li>● <b>TOTAL GEF Project</b></li> <li><b>Grand Total</b></li> </ul>	<p><b>Inputs: (budget for each component)</b></p> <p>(US\$ Millions)</p> <ul style="list-style-type: none"> <li>● 99.92</li> <li>● 5.75</li> <li>● 3.67</li> <li>● 8.58</li> <li>● 5.58</li> <li>● 0.9</li> <li>● 10.0</li> <li>● <b>134.40</b></li> <li><b>7.93</b></li> <li><b>142.33</b></li> </ul>	<p><b>Project reports:</b></p> <p>Supervision reports</p> <p>Quarterly Reports Management Reports (PMRs) from PROTRANSPORTE</p> <p>Project Audit Reports</p>	<p><b>(from Components to Outputs)</b></p> <p>Procurement Training to EMAPE and PROTRANSPORTE completed.</p> <p>Financial Management and Accounting system of PROTRANSPORTE strengthened.</p> <p>Timely availability of counterpart funds.</p>

## **Annex 2: Detailed Project Description**

### **PERU: LIMA TRANSPORT**

The Project will finance 28.6 km of segregated high-capacity busways, the first phase of a network serving primarily the low-income population living in the urban periphery who need an efficient and affordable public transport service. The busways will be built along existing road corridors and thus do not require land acquisition. Major terminals will be built at the northern (Independencia) and southern (Chorrillos) ends of the busway, providing easy transfer with feeder buses serving low-income growth areas at Lima's edge; feeder roads to the terminals will also be improved, with particular focus on the accessibility by feeder buses, pedestrians and bicycles. The busway will also include 35 stations, resulting in an average distance of 753 m between stations.

While the physical infrastructure will be financed by MML and the proposed Loans, private concessionaires will finance the buses and bus maintenance equipment on the facilities provided under the Project. The fare collection system will also be concessioned and operated privately; the Project will specify an integrated fare collection system for the busway and feeder services; prepare the business plan for the bus service concessions; support the creation and strengthening of an operations entity; and assist in the development of an efficient organizational structure for the municipal management of traffic and transport. Within the framework of the latter, the project will assist the municipal transport agencies in developing well-defined responsibilities, coordinated management and resource utilization, and performance monitoring and control mechanisms of traffic and transport.

#### **By Component:**

##### **Project Component 1: Mobility and Environmental Improvements - US\$99.92 million**

This component comprises primarily infrastructure works to implement the busways along existing road corridors: (i) construction of 28.6 km of segregated busways; (ii) repaving of mixed-traffic lanes adjacent to the new busways; (iii) traffic signal improvements, signposting and road markings along the corridors; (iv) bus stations and terminals; (v) bus depots and workshops, excluding equipment which will be financed by the bus concessionaires; (vi) control center, to monitor and direct operations on the busways; (vii) paving and other improvement of feeder roads to the two bus terminals, with an approximate length of about 50 km; this will include the construction of sidewalks and bicycle paths to improve access conditions for non-motorized movement, complementing the non-motorized transport investments under GEF grant; (viii) road safety measures along the corridors, its feeder roads, and the streets in its area of direct influence; and (ix) improvements to pedestrian and vehicular corridors, pedestrians and busway users.

The proposed busway operations, including all physical works, will be based on 'inclusive design' principles that take into account the needs of vulnerable (e.g., women, elderly, children) and handicapped (i.e. mobility and visually impaired) public transport users. In addition to the above, this component includes the implementation and initial operation of an improved air quality monitoring system.

#### **Busway construction:**

The main subcomponent of the Project (37% of total costs) is the construction of 28.6 km of busways, which will be physically segregated from mixed-traffic lanes and thus will not be subject to general traffic congestion. As demonstrated in Bogotá, Curitiba and other Latin American cities, segregated high-capacity busways permit a reliable and relatively high-speed public transport supply which would not be possible

with the traditional bus services.

In the northern sections (No. 1, 2 and 3 in the table below) and part of the southernmost section (No.7), the busway will have two lanes in each direction, whereas in the other sections it will have one lane in each direction. As shown in figure xxxx, the busway will follow an almost straight alignment, connecting the northern district of Independencia with the southern district of Chorrillos. In central Lima, it splits into two sections (No. 3 and 5 below, the former bypassing the historical city center with about two thirds of bus services, and the latter passing through it with about one third of the bus services). The reinstatement of public transport into the center will make it possible to restrict the current proliferation of informal taxis in that area and is expected to help in revitalizing the center. The existing busway on the Vía Expresa (sections 4 and 6) will be adapted to include an additional lane at each bus stop, thereby making it possible for express buses to overtake local-service buses.

	<b>Busway Section</b>	<b>length (km)</b>
1	Av. Tupac Amaru, from Av. Naranjal to Av. Caquetá	6.059
2	Av. Caquetá, from Av. Tupac Amaru to Plaza Castilla	1.67
3	Av. Alfonso Ugarte, Av. España and Paseo de los Héroes Navales (from Plaza Castilla to Plaza Grau)	3.202
4	Paseo de la República from Plaza Grau to Av. México overpass	1.711
5	Av. Emancipación and calle Lampa from Plaza Castilla to Plaza Grau	2.105
6	Vía Expresa from Av. México overpass to Av. República de Panamá	7.463
7	Av. República de Panamá, Av. Bolognesi, Av. Escuela Militar, Paseo de la República, Av. las Gavintas and old Panamericana Sur until southern terminal	6.419
<b>Total length</b>		<b>28.629 km</b>

The busways will be subjected to high volumes of vehicles with a fairly heavy axle load, and thus special attention was given to pavement design. The engineering consultants concluded that the busway pavements would consist of 20cm of asphalt concrete mix (in three layers), on top of a 25cm granular base and, in areas with soft soil, i.e. a CBR (California Bearing Ratio) of less than 20, a subbase of up to 50cm depth.

#### Repaving of mixed-traffic lanes

Adjacent to virtually all new busways, two or three lanes in each direction will be maintained for general traffic flow which is expected to improve substantially because the currently chaotic operation of many small-capacity buses will be replaced by fewer large-capacity buses operating on the busways. Except for the Vía Expresa and most of Av. Ugarte where busways already exist, the geometric design of the affected avenues will be modified with new alignments of medians and dividers, and islands at intersections. As part of the reconstruction of these avenues, the mixed-traffic lanes will be rehabilitated and existing cracks and potholes repaired, followed by a 5cm asphalt-concrete overlay.

#### Traffic signals, signposting and road markings along the corridors

New traffic control devices will be installed along the entire corridor, using Peruvian standards. The designs give special attention to the safety of passengers coming from and going to the busway stations, and traffic signals will be installed at the access points to those stations where passengers need to cross mixed-traffic lanes. In addition, new signals will be installed at most intersections of the corridor, and in their immediate vicinity, where the changed geometric configurations and circulation patterns require new

traffic control devices in any case.

### Bus stations and terminals

Passenger access to the new busway will only be possible at 35 dedicated stations, the terminals at the two ends of the busway, and the intermediate terminal at the Plaza Grau. Bus stops and terminals account for 15% of total Project costs, or about 40% of the busway itself. To maximize commercial bus speeds and throughput capacity, fares will be paid before entering the stations which will have high platforms (90cm above the busway pavement) thereby permitting level boarding and alighting as is normally done on metros. Stations will have a single platform between opposing busway lanes, an arrangement which generates substantial operational and spatial efficiencies. The proposed buses will thus require high-level doors on the left side, which precludes their commercial operation on normal streets but, as was learned from the recent TransMilenio (Bogotá) and Ecovías (Quito) systems, contributes to an innovative and attractive image of the new public transport system.

The passenger facilities have been designed to permit universal access to all passengers, including the mobility and vision impaired. To reach the high platforms, 15 meter long ramps with an 8% gradient will permit wheelchair access; at the stops with passenger access from overhead bridges, such as those on the Vía Expresa, elevators will be built to accommodate mobility impaired passengers.

At the two ends of the busway, major terminal stations are planned to facilitate the efficient transfer of passengers between trunkline and feeder buses. The basic terminal design consists of two adjacent platforms located in the center of the avenue, one for each type of service, connected by a second level structure making it possible for passengers to move from one to the other platform without having to cross bus or other traffic.

### Bus depots and workshops

The Project includes the provision of three patios for a total of 170 articulated buses within 1.5 km from the northern terminal, and another one for about 100 buses located 0.6 km from the southern terminal. Because of the proximity of the environmentally protected Pantanos de Villa near the southern terminal, fuel supply, maintenance and cleaning of the buses will be carried out at the northern end. The bus service tenders will specify that maintenance equipment required for reliable and safe operation of the buses be provided by the private consortia as part of their concessions.

### Control center

The efficient functioning of the busways requires a strict monitoring of bus operations, aiming at good schedule adherence, optimal dispatching of buses and avoidance of bus bunching. To achieve this, the Project will include an electronic control center linked with GPS in each of the buses, similar in concept to TransMilenio and other recent bus service reforms.

### Paving and other improvement of feeder roads

To permit efficient operation of the feeder buses to the two busway terminals, about 50 km of existing roads will be rehabilitated and improved as required. This will include the construction of sidewalks and bicycle paths to improve access conditions for non-motorized movement, complementing the non-motorized transport investments under GEF grant. Inclusive designs will be used for the construction/rehabilitation of sidewalks and bikepaths, benefiting mobility constrained road users.

### Road safety measures

The design of road safety measures to be included in the project will be addressed under a separate component, supported through bilateral assistance from the Danish Government. The support will focus on a road safety focused review of (i) the urban transport sector regulatory framework, (ii) the urban transport sector institutional arrangements, and (iii) the Municipal Road Safety Action plan. The resulting recommendations will include a road safety audit of the busways to be implemented by the proposed project and the recommendations will be incorporated in the regulatory framework, the institutional strengthening and the design of the busways and associated road improvements.

### Improvements to pedestrian and vehicular circulation

Complementing the bicycle promotion component financed under the GEF Grant, dedicated bikeways will be built to connect poor outlying neighborhoods to the two main busway terminals. This subcomponent includes bike parking and improvements to pedestrian facilities, such as ramps and traffic calming measures. In five specific areas along the busway, selected on the basis of their important social activity functions, improvements will be made to public space, with emphasis on the interface between the busways, pedestrians and bus passengers.

### Improved air quality monitoring system

Air quality monitoring will be greatly improved by expanding the rudimentary monitoring system that has been built up under the Bank-assisted Clean Air Initiative for Latin American Cities. While focusing on the areas served by the new bus corridors. The new monitoring equipment will be part of a future, more extensive air quality management system. While the equipment acquired under this Project will belong to MLM, its operation will be carried out by the existing Clean Air Committee and the Ministry of Health which has an assured budget for the operation and maintenance of the air quality system.

### **Project Component 2. Social Mitigation and Community Participation - US\$5.75 million**

This component comprises three activity areas: (i) community consultation and education during the implementation and early phases of busway ; (ii) mitigation of the negative impacts on some current bus operators, through retraining and small-scale enterprise loans in collaboration with existing programs of the Ministry of Labor; and (iii) financial support during the initial months of busway operations, to be provided entirely from counterpart funds.

### **Project Component 3. Institutional Strengthening - US\$ 3.67 million**

This component addresses the regulatory, monitoring, and control functions of urban public transport and supports: (i) the development and implementation of a public transport policy, including its regulatory and policy-setting framework, as well as its administration, operation, monitoring and control; (ii) the formal creation, technical assistance and training of PROTRANSPORTE, the entity responsible for implementing the busway operations; (iii) technical assistance and training of EMAPE, the entity responsible for implementing the physical works under the Project; (iii) technical assistance and training of DMTU and the national police, focusing on public transport regulations, and its monitoring, control and enforcement; and (iv) monitoring and evaluation of the busway operation and the Project.

### **Project Component 4. Studies and Construction Supervision - US\$8.58 million**

This includes (i) supervision of the physical works described above; and (ii) economic feasibility and environmental studies as well as the preparation final engineering designs to expand the busway network beyond the 28.6 km funded by the Project.

**Project Component 5. Program Administration - US\$5.58 million**

This component, entirely to be financed from counterpart funds, includes the operational expenses of the institutions responsible for administering the Project and for implementing the busway operations, most likely PROTRANSPORTE and EMAPE.

**Project Component 6. Grade Separation at Plaza Grau - US\$10.00 million**

Later in 2003, MML will initiate the re-construction at the Plaza Grau, one of Lima's busiest intersections and a key node of the busway to be financed under the Project. A grade separation of conflicting traffic movements is required in order to insert the busway on the northernmost end of the Paseo de la República, thereby reducing the car traffic lanes from three to two in each direction. This component will be entirely funded by the Municipality, but is a part of the overall Project.

**Annex 3: Estimated Project Costs**  
**PERU: LIMA TRANSPORT**

<b>Project Cost By Component</b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
1. Mobility and Environmental Improvements	65.10	21.70	86.80
2. Social Mitigation and Community Participation	5.00	0.00	5.00
3. Institutional Strengthening	1.58	1.61	3.19
4. Studies and Construction Supervision	3.73	3.73	7.46
5. Program Administration	4.85	0.00	4.85
6. Grade Separation at Plaza Grau	7.50	2.50	10.00
7. Financial Auditing	0.00	0.30	0.30
	0.00	0.00	0.00
<b>Total Baseline Cost</b>	87.76	29.84	117.60
<b>Physical Contingencies</b>	6.52	3.50	10.02
<b>Price Contingencies</b>	3.82	2.06	5.88
<b>Total Project Costs<sup>1</sup></b>	98.10	35.40	133.50
Front-end fee		0.90	0.90
<b>Total Financing Required</b>	98.10	36.30	134.40

<b>Project Cost By Category</b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
<b>Works</b>	65.00	18.98	83.98
<b>Goods</b>	3.20	4.80	8.00
<b>Services</b>	7.44	5.25	12.69
<b>Training</b>	1.08	0.00	1.08
<b>Microcredits</b>	0.90	0.00	0.90
<b>Operational Cost</b>	6.35	0.00	6.35
<b>Land Adquisition</b>	4.60	0.00	4.60
<b>Uncallocated</b>	9.53	6.37	15.90
<b>Total Project Costs<sup>1</sup></b>	98.10	35.40	133.50
Front-end fee		0.90	0.90
<b>Total Financing Required</b>	98.10	36.30	134.40

<b>GEF Project Cost by Component</b>	<b>Local</b>	<b>Foreign</b>	<b>Total</b>
A.Public Transport Fleet Rationalization	1.70		1.70
B.Rehabilitation of Lima-Callao Bikeway Network	3.76	0.42	4.18
C.Institutional Strengthening Program on Sustainable Transport	0.99	0.11	1.10
D. Management, Monitoring/Evaluation & Replication Strategy	0.77	0.09	0.86
E. Operational Costs	0.09		0.09
<b>Total GEF Project Components</b>	<b>7.31</b>	<b>0.62</b>	<b>7.93</b>
<b>Total Project Costs (loan + GEF)</b>	<b>105.61</b>	<b>36.72</b>	<b>142.33</b>



<b>GEF Project Cost by Category</b>	<b>Local</b>	<b>Foreign</b>	<b>Total</b>
1. Works	3.070		3.070
2. Goods	0.023	0.157	0.180
3. Services	4.130	0.463	4.593
4. Operational Costs	0.087		0.087
<b>Total GEF Project Costs</b>	<b>7.310</b>	<b>0.620</b>	<b>7.930</b>
<b>Total Financing Plan</b>	<b>105.61</b>	<b>36.72</b>	<b>142.33</b>

<sup>1</sup> Identifiable taxes and duties are 19.4 (US\$m) and the total project cost, net of taxes, is 115 (US\$m). Therefore, the project cost sharing ratio is 39.13% of total project cost net of taxes.

## **Annex 4: Cost Benefit Analysis Summary**

### **PERU: LIMA TRANSPORT**

#### **Introduction**

A cost-benefit analysis was conducted to determine the economic feasibility of the physical improvement component of the project, which represents about 80% of the total investment costs. This component includes the following sub-components: (i) construction of segregated bus-corridors, terminals, workshops, and stops; (ii) rehabilitation and/or construction of feeder routes; (iii) construction of bicycle paths; and (iv) development of an environmental management plan that includes setting up a minimum monitoring and an air quality measurement system in areas of influence of the bus-corridors and their surroundings. Included in the economic analysis is also the investment in the grade separation at Plaza Grau to be financed by the Municipality with its own resources, but integral part for the proper functioning of the high-capacity bus corridor.

#### **Methodology<sup>1</sup>**

The methodology for the economic evaluation of the project is based on two main supporting documents: (a) the Urban Transport Model, a classical trip generation model formulated in 1997 for the Electric Train Autonomous Authority (or AATE for its Spanish acronym), built upon an extensive O-D survey carried out in 1992 and calibrated for 1997; and (b) the Directive No. 004-2002-EF/68.01 (General Directive of the National System of Public Investment) and the ensuing economic evaluation manual of the Ministry of Economy and Finance (MED) where values are given to conversion factors (to obtain the economic prices), social discount rate (of 14%), and overall benefits and costs to be accounted for (including unit values for time savings). With this information, the demand for the trunk and feeder corridors was estimated, alternative alignments were explored and analyzed, and the costs and benefits were calculated in economic prices. Subsequently, the contents of Chapter 10 of the World Bank “Handbook on Economic Analysis of Investment Operations” were used to undertake the relevant sensitivity and risk analyses.

The methodology followed a comprehensive process of evaluation of design alternatives (including a multicriteria evaluation—with criteria such as costs, operational requirements, urban development and socio-environmental impacts, and effects on other projects—that attempted to reflect the perceptions received from a survey of—mostly low income—users undertaken by the NGO DESCO in June 2002), a demand modeling exercise (built over the TRANSCAD platform) of generation and assignment of trips, and an exhaustive consideration of benefits and costs (as explained below), though excluding those that are hard to quantify (environmental benefits and reduction in accidents) but produce results on the safe side.

In brief, the results of the analysis yielded an NPV (at 14% discount rate) of US\$61 million (or about S/. 211 million) and an Economic Internal Rate of Return of 20.7%. The sensitivity and risk analyses further showed the robustness of the project, with a low 1.5% probability that the project turns out non-economic and an expected NPV of US\$52.4 million (based on prevalent probability distributions for key demand, construction and operating variables).

## **Incremental Benefits and Costs**

The economic analysis encompassed the analysis of the costs and benefits incremental to a “without project” situation consisting of the improved provision of the existing transport services without major investments (but improved by enhancements in traffic management along corridor). Under this situation, the expected increase in the population and in the travel demand along the corridor (which is assumed to be similar to the “with project” situation—that is, no additional induced demand—erring on the safe side, as this assumption favors the “without project” situation) was simulated for the calculation of the travel times of passengers and the vehicle operating costs of the bus operators, which were then compared to the “with project” situation.

For the “with project” situation, the analysis includes the effects from both the “trunk” lines and the “feeder” lines. The analysis includes the assessment of the operating costs for these two types of services which differ as for the trunk network the vehicles are new, high capacity buses, while for the feeder lines the vehicles consist of existing vehicles that will be gradually substituted during the project life. For the savings in travel times, as stated above, it is assumed the same number of passengers for the “with” and “without” situations and an average value for travel time savings (reflecting the methodology established by the Ministry of Economy and Finance). The benefits to existing private cars are also included in terms of the lower travel times that would be generated through more orderly traffic flows along the corridor.

*Demand estimation.* The trip generation model was based on the information used in the 1997 UTM and the subsequent changes to socio-economic data (population, motorization rates, employment, and school places) for the metropolitan area as a whole. With population estimates for 1997, 2000 and every five years thereafter, and expected motorization rates, an estimate was undertaken of the number of inhabitants with cars and, with the average number of people per household, the number of households without private cars was estimated for each of the zones among which the corridor was divided. Additionally, the split of trips among purposes for all types of transportation was evaluated on the basis of the 1997 OD survey and the most recent stated-preference surveys carried out during project preparation, with the following results: home-based for work (54%), studies (24%), shopping (6%), and others (2%), and non-home based (14%). A gravitational model was then applied—from travel impedance formulas that combines exponential and quadratic terms, and with information from actual histograms of travel times across zones and the application of up-to-date volume/delay functions—and calibrated for the years 2001 and 2003 to obtain the distribution of trips across zones. The algorithm for the distribution of public-transportation trips was based in the calculation of optimal strategies, looking for those trips that represent the minimum generalized cost between each OD pair, with consideration of the walking, waiting, transfer and on-board times. The modal split distribution was achieved through the data obtained from a stated-preference survey (on relative times, utility and cost) and the application of a logit model.

For the project, with the parameters for the trunk-feeder system, its operational characteristics, and the tariff strategies, demand simulations were developed for year 2003 (upon the TRANSCAD platform), seeking to reflect prevailing operational performance (like that of the Transmilenio system in Bogota, Colombia, with average speeds of between 26 and 31 km/h and value of times equal to 3.5 soles/hour, the one advised in the directive of the MEF). The results yielded the following expected demand to be attended by the proposed system:

<b>Routes</b>	<b>Passengers (per day)</b>	<b>Percent</b>
Trunk (only)	234,916	45.50%
Feeder (only)	83,123	16.10%
Both trunk and feeder	198,250	38.40%
Feeder (only)	83,123	16.10%
Total number of pass	516,289	100%

Through the horizon year of the analysis, three elements were considered to estimate the growth in demand: (a) a positive population growth rate; (b) a reasonable economic growth; and (c) a decrease in motorization rates.

The estimated demand allowed to calculate the dimensions of the new high-capacity fleet (225 vehicles) and the need to “retire” and “substitute” a large part of the existing oversupply of vehicles (either buses, “rural trucks” or “combis”, and taxis), including the acquisition of 154 new (standard) buses to operate on the feeder routes. With the fleet numbers, it was then possible to estimate the operational needs along each route and the related costs.

*Incremental Costs.* Investment costs include the costs related to the construction of the busway, terminals, workshops, parking facilities, and stations, and the rehabilitation of construction of feeder routes and bicycle paths. The total cost of these physical investments amounts to US\$134.4 million (including the underpass in Plaza Grau for about US\$10 million to be financed entirely with local resources, and the environmental mitigation and institutional strengthening measures). In addition, the cost of acquiring the additional vehicles would amount to an initial investment of less than US\$50 million (including the costs association with the plan of “replacing” and “scrapping” the old excess buses). These costs have been converted to economic prices by deducting taxes, following the conversion factors established in the Directive of the MEF. The adjusted prices are US\$122.8 million and US\$45.6 million, respectively. The expected use life of the vehicles is set at 10 years, and the residual value at 10% of the initial costs.

Annual operation and maintenance incremental costs of the new facilities and infrastructure has been estimated at 5% of the investment cost, on the basis of the experience of other similar busway systems (and in particular that of the Transmilenio system in Bogota).

Finally, an incremental cost has been assigned to the interferences to existing traffic during the two-year construction of the new system. An annual value of 6.6 million hours, of which about 82% correspond to exiting bus passengers, has been estimated. With the value of time established by the directive of the MEF, this amount of hours correspond to a total cost of US\$3.2 million in 1994 and of US\$3.4 million in 2005.

*Incremental benefits.* The net benefits from the physical improvements components include: (i) the reduction in vehicle operating costs for both public and private vehicles, and (ii) the travel time savings and reduction in public transport user costs, both due to the rationalization of public transport services and higher commercial speeds facilitated by the segregated bus-corridors.

The unit operating costs were estimated upon the analysis of the unit prices for each of the operating inputs (e.g., gasoline, spare parts, and salaries) with the following values (after the application of the relevant conversion factors):

Cost in US\$	New buses	"Replaced" buses
	Articulated	SimpleCombisMicrobusesOmnibuses
Cost per veh.-km	0.439	0.3220.2170.2740.322

The benefits from travel time savings for both the bus passengers and for private cars yielding annual savings of about 18.58 million for the former and about 0.43 million for the latter (that is about 2.3%). The value of time is established in Directive 004-2202-EF/68.01 in US\$0.80/hour for private vehicles and US\$0.31 for users of public transportation. (These values correspond to year 2001 and must be updated yearly in line with the estimated increases in per-capita incomes.)

The implementation of the project will bring other benefits, mainly those pertaining to the reduction in traffic accidents and air/noise pollution through reduced emissions in the area of influence of the project. These benefits are difficult to quantify without the availability of reliable databases and have not been included in the cost-benefit calculations. Another important benefit is the improved accessibility for other population groups—bicyclists and pedestrians—and vulnerable users—the elderly and people with disabilities—through dedicated design provisions under the project.

In all, the annual flow of benefits and costs are shown in the following table:

**Project Benefits and Costs in Economic Prices  
(US\$ million)**

Year	Investment costs	Net maintenance costs	Vehicle acquisition costs	Net vehicle operating costs	Time saving benefits	Total net benefits
2004	(61,398,305)	-	-	-	(3,181,252)	(64,579,557)
2005	(61,398,305)	-	(45,560,174)	-	(3,445,179)	(110,403,658)
2006	-	(6,139,831)	(548,743)	38,687,591	8,252,231	40,251,248
2007	-	(6,139,831)	(516,398)	38,559,606	8,637,859	40,541,236
2008	-	(6,139,831)	(489,374)	38,436,904	9,033,264	40,840,963
2009	-	(6,139,831)	(471,492)	38,317,380	9,455,287	41,161,344
2010	-	(6,139,831)	(453,705)	38,201,141	9,889,487	41,497,092
2011	-	(6,139,831)	(446,332)	38,085,620	10,330,509	41,829,966
2012	-	(6,139,831)	(437,943)	37,971,127	10,769,387	42,162,740
2013	-	(6,139,831)	(415,096)	37,861,535	11,162,484	42,469,092
2014	-	(6,139,831)	(405,222)	37,753,547	11,550,671	42,759,165
2015	-	(6,139,831)	(40,264,695)	37,646,099	11,931,879	3,173,452
2016	-	(6,139,831)	(885,725)	37,539,767	12,287,768	42,801,979
2017	-	(6,139,831)	(849,628)	37,434,407	12,618,670	43,063,618
2018	-	(6,139,831)	(816,985)	37,330,429	12,924,590	43,298,203
2019	-	(6,139,831)	(791,257)	37,228,250	13,205,705	43,502,867
2020	-	(6,139,831)	(766,931)	37,127,561	13,470,926	43,691,725
2021	-	(6,139,831)	(750,613)	37,028,797	13,720,031	43,858,384
2022	-	(6,139,831)	(732,060)	36,932,394	13,952,858	44,013,361
2023	30,699,153	(6,139,831)	16,359,416	36,838,166	14,176,839	91,933,743

**Summary Results**

The annual flow of net benefits shows that the project is economically feasible. The resulting EIRR (Economic Internal Rate of Return) is 20.7% and the NPV (Net Present Value) is about US\$61 million, for a discount rate of 14% (the one established in the Directive of the MEF).

The table shows that in the 20-year horizon of analysis, benefits from time savings gradually increase to become about 40% of the benefits from reduced vehicle operating costs. In present value terms, benefits from time savings represent 75% of the total combined net benefits of the project (i.e., after accounting for all its costs and benefits).

### Sensitivity Analysis

A sensitivity analysis was carried out in order to facilitate the comparison of the sensitivities of the different independent variables using, for each of them, values 30% lower and 30% higher than the estimated value used in the base calculation. The sensitivity analysis shows that changes to the main variables (time savings, unit resource costs for vehicle operation, demand growth rate, time value, etc.) do not produce negative NPVs or EIRR lower than 14%, though the effect is larger in the case of changes to investment costs, shadow price ratios and savings in operational costs, as shown in the following table.

**Summary of the Sensitivity Analysis**

Parameter	EIRR Varying the Parameter	
	-30%	30%
Savings in vehicle operation	14,42	26,57
Investment	27,57	16,04
Unit costs of salary remunerations	17,97	23,35
Fuel consumption unit cost	18,79	22,58
Vehicle acquisition costs	22,56	19,01
Savings in travel time (users)	19,22	22,14
Time savings (overall)	19,37	21,97
Infrastructure maintenance costs	21,67	19,73
Infrastructure residual value	20,67	20,74
Demand growth rate	20,74	20,67

Furthermore, a risk analysis was carried out with a Montecarlo simulation of the main input variables with probabilistic distributions of their variation in the following manner: (a) investment costs following a Beta [0,1] triangular distribution with a minimum value equal to the estimate one and a maximum value of 20% above the estimated value; (b) a normal distribution of operating costs with a standard deviation of 10% (representing that 95% of the values fall with a plus/minus 30% around the estimated value); (c) a normal distribution for the conversion factors with a standard deviation of 5%; (d) an asymmetrical triangular distribution of time savings, between a minus 20% and a plus 10% around the estimated value; and (e) a normal distribution for the vehicle acquisition costs with a standard deviation of 7.5%. The Montecarlo simulation yielded frequencies resulting in a less than 2% probability that the NPV would turn negative. The expected NPV of the resulting distribution amounted to US\$52.4 million.

In sum, the economic feasibility of the project is robust. Its travel time-related benefits (more than 97%) accrue to bus users, largely lower-income population.

<sup>1</sup>The information provided in this Annex builds on the extensive feasibility study prepared by Pro-Tansporte based on analyses undertaken by Getinsa-Taryet during the preparation of the project, with financing from the Spanish Trust Fund at the Inter-American Development Bank: “Programa de Transport Urbano de Lima Metropolitana (PTUL) – Subsistema Norte Sur: Estudio de Factibilidad”, February 2003.

**Summary of Benefits and Costs:**

**Main Assumptions:**

**Sensitivity analysis / Switching values of critical items:**

## Annex 5: Financial Summary

### PERU: LIMA TRANSPORT

Years Ending

December 31

United States Dollar (USD) million

	IMPLEMENTATION PERIOD						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
<b>Total Financing Required</b>							
<b>Project Costs</b>							
<b>Investment Costs</b>	7.8	34.3	42.3	41.0	11.5	0.0	0.0
<b>Recurrent Costs</b>	0.8	0.8	1.1	1.1	1.1	0.0	0.0
<b>Total Project Costs</b>	8.6	35.1	43.4	42.1	12.6	0.0	0.0
<b>Front-end fee</b>	0.5	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Financing</b>	9.1	35.1	43.4	42.1	12.6	0.0	0.0
<b>Financing</b>							
<b>IBRD/IDA</b>	1.7	11.0	13.9	13.5	4.4	0.0	0.0
<b>Government</b>	0.8	2.4	13.9	13.5	3.8	0.0	0.0
<b>Central</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Provincial</b>	0.8	2.4	13.9	13.5	3.8	0.0	0.0
<b>Co-financiersGEF</b>	2.5	2.1	1.7	1.6	0.0	0.0	0.0
<b>Grade Separation at Plaza Grau</b>	1.4	8.6	0.0	0.0	0.0	0.0	0.0
<b>Front-end fee</b>	0.5	0.0	0.0	0.0	0.0	0.0	0.0
<b>IDB</b>	2.2	11.0	13.9	13.5	4.4	0.0	0.0
<b>Total Project Financing</b>	9.1	35.1	43.4	42.1	12.6	0.0	0.0

**Main assumptions:**



## Annex 6(A): Procurement Arrangements

### PERU: LIMA TRANSPORT

#### Procurement

##### **Procurement methods (Table A)**

Works and goods will be procured in accordance with the provisions of the “Guidelines for Procurement under IBRD Loans and IDA Credits” dated January 1995 and revised in January and August 1996, September 1997 and January 1999. Procurement of consultant services will follow the “Guidelines for the Selection and Employment of Consultants” published by the Bank in January 1997 and revised in September 1997, January 1999 and May 2002. Standard Bidding documents and RFP (Request for Proposals) acceptable to the World Bank and the Inter-American Development Bank (IDB) have been developed and will be formally agreed prior to loan negotiations.

Participation of contractors from non-IDB member countries is unlikely. However, the procurement advertisements and bidding documents will clearly state that participation is possible by firms from any country eligible under World Bank guidelines, and that the financing will be secured by the World Bank loan. In the event that that bidder who has submitted the lowest evaluated bid is from a country not eligible under IDB guidelines, the World Bank will authorize an increase in the *pari-passu* established in order to cover IDB’s portion and meet the expenditures incurred in respect of that contract. The IDB will authorize a similar increase in respect of other contracts eligible for IDB financing until the balance is reestablished.

##### ***Procurement Arrangements:***

With regard to the Lima Transport Loan, PROTRANSPORTE will act as the Project Coordination Unit (PCU) with primary responsibility on project coordination and implementation. This Unit will be also responsible for the procurement of goods and selection of consultants. Due to prior experience in bidding and contract management of transport-related civil works, it was agreed that EMAPE, Lima’s municipal agency responsible for administration of highway tolls in Lima, assist PROTRANSPORTE in managing the procurement of civil works and contract administration related to the implementation of infrastructure investments and the Plaza Grau grade separation components.

With regard to the GEF Grant, the National Environmental Fund (*Fondo Nacional del Ambiente - FONAM*), will be the public agency responsible for overall project coordination and implementation, and for the procurement of the motorized transport component<sup>1</sup> and the short bikeway sections located in Callao. FONAM is a public organization reporting directly to the office of the Peruvian Prime Minister. The bikeways located in Lima and other parts of the non-motorized component will be implemented by the Municipality of Metropolitan Lima’s Special Metropolitan Project for Non-Motorized Transport Unit (*Programa Especial Municipal de Transporte no Motorizado-PEMTNM*).

---

<sup>1</sup> Except for the micro-credits to transit workers displaced by the bus scrapping component, which will be implemented by PROTRANSPORTE as part of an identical micro-credit scheme funded under the Lima Transport Loan.

## ***Procurement Planning***

Overall Procurement Plans prepared by PROTRANSPORTE and FONAM were agreed with the Bank project team during project appraisal. It provided the basis for identification of procurement methods and setting up of aggregate amounts. These plans will be submitted to the RPA Office for review and clearance prior to loan negotiations. Detailed Procurement Plans for the first year of project implementation will be agreed during loan negotiations.

Since project procurement tasks will focus mainly on selection activities requiring critical inputs from consultants, twice-yearly review of selection plans should be performed, no later than May 30 and November 30 of each year of project implementation. Frequency of plan updating would be also an effective project management practice tool to ensure timely and efficient delivery of annual plans. Training on preparation and use of procurement plans should be also provided by the Banks not later than the project launching date.

## ***Summary of Procurement Capacity Assessment (PCA) & Strengthening of the Coordinating Units***

The PCA was carried out between June 23 and July 3, 2003 and concluded that, at its stage, the implementing agencies lacked: (i) prior experience in Bank-financed projects and adequate knowledge of Bank guidelines and procedures governing procurement, as provided by either IBRD and IADB; (ii) experienced and capable staff to implement Bank-financed project procurement; (iii) a professional and reliable project filing system; and (iv) an integrated project information system to carry out monitoring, control and reporting tasks for efficient project coordination and decision-making. With regard to the GEF grant, the PCA also noted (v) the lack of adequate hardware and software equipment to efficiently carry out project implementation and coordination tasks, and (vi) some degree of uncertainty regarding timeliness for the creation of the GEF Unit within FONAM. The overall procurement risk level was thus determined to be **high** for both the loan and the grant. In order to upgrade the level of procurement competence, the PCA proposed a Global Improvement Action Plan which will be agreed at negotiations.

*Legal Aspects.* The public procurement framework in Peru is governed by the Procurement and Contracting Law and its Regulations (Ley de Adquisiciones y Contrataciones del Estado y su Reglamento) enacted through the Law 26850 and later modifications incorporated in the Law and its Regulations through the Supreme Decrees No. 012-2001-PCM and 013-2001-PCM respectively. The local legal framework clearly exempts international agreements and treaties with bilateral and multilateral financing agencies of the application of local procurement provisions (Third Complementary Provision of the Law and Seventh Complementary Provision of the Regulations). However, the law and its regulations do not fully address specific procurement issues concerning procurement of works, goods and selection of consultants that are not fully consistent with the Bank Procurement and Selection Guidelines. The PCA thus recommended that, in order to avoid confusion or any risk of misprocurement, a set of special provisions be included in the Loan and Grant Agreements which exclude the use of such provisions in NCB tenders and the selection of consultants. More details on the legal frameworks and other aspects of public procurement can be found in the Peru Country Procurement Assessment Review (CPAR) carried out jointly by the Bank and the GOP in July 2001.

*Organization and Staffing:* The main implementing agency of the loan, PROTRANSPORTE, currently receives procurement support to meet general service requirements, from a Procurement Officer and an Administrative Assistant provided by MML's Administration Department. However, specialized assistance in procurement with staff skilled and knowledgeable of Bank-financed projects is needed, which implies the employment of a Procurement Officer. The project organizational structure of the Lima

Transport project will also require the gradual incorporation of additional technical and administrative staff in areas such as: contract administration; field-assigned project coordination; financial management; budget and accounting (currently contracted out under outsourcing); IT service administration and coordination, including hardware and software administration and maintenance; and specialized legal procurement assistance.

With regard to the GEF grant, a unit will be created in FONAM, which would include the team that successfully implemented the preparatory PDF grant since February 2002. That team comprises one engineer, one administrator, and two social communicators. Likewise, PEMTNM will create a dedicated project group to manage procurement and social promotion tasks, made up by one engineer responsible for design coordination and planning; one social Communicator in charge of carrying out social promotion and community organization; and one administrative assistant.

*Procurement Environment and Professional Experience in Procurement:* None of the prospective implementing agencies has experience in Bank-financed project procurement. It is thus urgent that these agencies (PROTRANSPORTE, EMAPE, FONAM and PEMTNM) employ experienced and capable procurement staff in order to provide specialized assistance and to strengthen and compensate for this shortcoming. A procurement staffing plan will be agreed at negotiations for the four agencies in question. The employment of (at least ) one Procurement Officer by PROTRANSPORTE and EMAPE will be a condition for loan effectiveness, and by FONAM and PEMTNM for grant effectiveness.

Also, regardless of the qualifications and experience of the core procurement specialists to be hired, an initial learning stage will be needed, in which the team will have to acquire and master Bank procedures on the job. To address this risk, the Bank's procurement specialist and the project team have initiated a dialog with government on a Global Improvement Action Plan, with the objective of formalizing it during loan and grant negotiations. In addition to the employment of procurement officers, the Action Plan encompasses a series of discrete actions focused on supporting the learning process both in procurement and financial procedures. It is seen as an important tool from the standpoint of Bank supervision, as quality of procurement supervision will be a key requirement to ensure efficiency and timeliness of procurement actions in the project.

*Use of Procurement Documents.* With reference to the Lima Transport Loan, neither the prospective project agencies nor their staff have previous experience in the use of Bank documents for procurement of goods and works under ICB or NCB procedures, and for the selection of consultants. It is therefore essential to provide them with basic training in the use of procurement guidelines and procedures governing Bank-financed project implementation, not later than the project launching date. By loan negotiations, the Banks will make available to the PCU project standard documents acceptable to both the World Bank and the IDB. With reference to the GEF Grant, FONAM already has limited experience in using Bank Standard Procurement Documents, which were used for the selection of consultants under the preparatory PDF Grant. Prior to negotiations, it will submit standard documents for procurement of goods and works, and selection of consultants.

*Support and Control Systems.* To date, neither PROTRANSPORTE nor FONAM have control systems in place such as financial and procurement audits; internal audits; and specialized legal procurement assistance. Since Bank-financed projects are usually requested to comply with audit requirements, it was agreed that annual audit reports of financial and procurement records and transactions will each be submitted not later than 6 months and 4 months respectively, after the end of each fiscal year.

*Record Keeping and Filing System.* Article 6 of the Procurement Law provides for filing of procurement documentation as mandatory to all public entities and establishes that they will be responsible for keeping records as such, as of the outset of procurement or selection processes and until contract administrative closing with processing of the last payment. The project agencies will ensure the implementation of a comprehensive project filing system to systematically maintain records of procurement and consultant processes for purposes of enabling performance of financial and procurement audits and compliance with other related legal covenants in the Loan Agreement. The filing of documents in the PCU offices will provide increased security conditions and enable access to project documents in case that quick consultation is needed. Bank supervision missions should verify the implementation of an adequate document filing system not later than 3 months after loan effectiveness.

***Procurement under Lima Bus Transport Loan:***

Table A shows the project costs and procurement arrangements.

Expenditure Category	ICB	NCB	Other	N.B.F.	Total Cost
1. Works	35.84 (14.70)	23.30 (15.01)		24.84	83.98 (29.71)
2. Goods	5.60 (2.87)	0.75 (0.32)		1.65	8.00 (3.19)
3. Land Acquisition				4.60	4.60
4. Services			9.50 (4.36)	3.19	12.69 (4.36)
5. Training and Microcredits			1.51 (0.97)	0.47	1.98 (0.97)
6. Front-end fee			0.90 (0.45)		0.90 (0.45)
Operational Costs				6.35	6.35
Unallocated			12.60 (6.32)	3.30	15.90 (6.32)
Total	41.44 (17.57)	24.05 (15.33)	24.51 (12.10)	44.40	134.40 (45.00)

1/ Figures in parentheses are the amounts to be financed by the Bank Loan.

**Works:**

Works procured under this project are primarily for the construction of busways, stations, terminals, patios, feeder roads, bikeways, and recovery/improvement of public space near the busway. International Competitive Bidding (ICB) procedures will be used for work contracts of US\$ 5 million and more. Civil work contracts with estimated values below this threshold but equal \$250,000 equivalent or more will be procured through National Competitive Bidding (NCB) procedures, using standard bidding documents agreed in advance with the Banks. Small works estimated to cost less than US\$ 250,000 may be awarded on the basis of bids obtained from at least three qualified domestic contractors, using a model request for quotations satisfactory to the Banks. Works not financed with loan proceeds would be procured following local procedures.



## Goods:

Goods procured under this project include the acquisition of bus operations control equipment, traffic signals and air quality monitoring equipment, and also a relatively small amount (less than US\$ 800,000) for vehicles, office equipment and computer software.

Equipment with a an estimated cost of US\$ 350,000 or more will be carried out using ICB. For goods contracts with an estimated value below that threshold down to US\$50,000, National Competitive Bidding (NCB) procedures will be used with standard project bidding documents agreed in advance with the Banks. To the extent possible, contracts for office equipment and similar goods will be grouped into bidding packages of more than US\$ 50,000 and procured under NCB procedures. Contracts for goods which cannot be grouped into larger packages and estimated to cost less than US\$ 50,000 per contract may be procured using national shopping procedures based on a model request for at least three quotations, satisfactory to the Banks.

## Consultant Services:

Consultant services for employment of firms with estimated values of \$100,000 or more equivalent shall be procured with the use of the QCBS method. Consultant assignments of specific types, as agreed with the Bank in the Selection Plan and specified in the Loan Agreement and for which that method may not be the most appropriate for selecting consultants may be procured with the use of the following selection methods: (ii) Quality Based Selection (QBS); (iii) Selection under a Fixed Budget; (iv) Selection Based on Consultants' Qualifications; and, exceptionally (v) Single-Source Selection.

Individual Consultants shall be employed for consultant assignments requiring specialized expertise following the provisions set forth in Section V of the Bank Selection Guidelines.

**Table A1: Consultant Selection Arrangements (optional)**  
(US\$ million equivalent)

Consultant Services Expenditure Category	QCBS	QBS	SFB	LCS	CQ	Other	N.F.B.	Total Cost
A. Firms	6.15 (3.04)	0.83 (0.33)	0.05 (0.05)	0 0	0.20 (0.20)	0 0	6.34 0	13.57 (3.62)
B. Individuals	0 0	0 0	0 0	0 0	0 0	0.33 (0.33)	0 0	0.33 (0.33)
Total	6.15 (3.04)	0.83 (0.33)	0.05 (0.05)	0 0	0.20 (0.20)	0.33 (0.33)	6.34	13.90 (3.95)

<sup>1)</sup> Including contingencies

Note: QCBS = Quality- and Cost-Based Selection

QBS = Quality-based Selection

SFB = Selection under a Fixed Budget

LCS = Least-Cost Selection

CQ = Selection Based on Consultants' Qualifications

Other = Selection of individual consultants (per Section V of Consultants Guidelines), Commercial Practices, etc.

N.B.F. = Not Bank-financed

Figures in parentheses are the amounts to be financed by the Bank Loan/Grant.

**Procurement under Lima Bus Transport GEF Grant:**

Table A2 shows the project costs and procurement arrangements.

**Procurement Method - Table A2 (without contingencies)**

Expenditure Category	ICB	NCB	Other	N.B.F.	Total Cost
1.Works		2.970 (2.970)	0.100 (0.100)		3.070 (3.070)
2.Goods		0.070 (0.070)	0.110 (0.110)		0.180 (0.180)
3.Consultant Services			4.593 (4.593)		4.593 (4.593)
4.Operational Costs			0.087 (0.087)		0.087 (0.087)
5.Front-end fee					
Total		3.040 (3.040)	4.890 (4.890)		7.930 (7.930)

Figures en parentheses are the amounts to be financed by the Bank Grant.

**Other:** Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operations costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

**Works:**

Works procured under this project are primarily for the rehabilitation and construction bikeways. Seven contracts are envisaged, two of them to be managed by FONAM, and five by PEMTNM. International Competitive Bidding (ICB) procedures will be used for work contracts of US\$ 5.0 million and more<sup>2</sup>. For work contracts with estimated values below that threshold but equal \$250,000 equivalent or more, National Competitive Bidding (NCB) procedures will be used with standard bidding documents agreed in advance with the Bank. Work contracts with an estimated value below US\$250,000 may be awarded on the basis of proposals obtained from at least three qualified domestic contractors, using a model request for quotations satisfactory to the Bank.

**Goods:**

Goods procured under this project are a relatively small amount for bicycles, traffic safety devices, and office equipment. Equipment with a an estimated cost of US\$ 350,000 or more will be carried out using ICB<sup>3</sup>. For goods contracts with an estimated value below that threshold but equal \$50,000 equivalent or more, National Competitive Bidding (NCB) procedures will be used with standard bidding documents agreed in advance with the Bank. To the extent possible, contracts for office equipment and similar goods will be grouped into bidding packages of more than US\$ 50,000 and procured under NCB procedures. Contracts for goods which cannot be grouped into larger packages and estimated to cost less than US\$ 50,000 per contract may be procured using price comparison procedures (shopping) of at least three quotations obtained from local suppliers, based on a model request satisfactory to the Bank.

**Consultant Services:**

Consultant services for employment of firms with estimated values of \$100,000 or more equivalent shall be procured with the use of the QCBS method. Consultant assignments of specific types costing less than \$100,000 equivalent each, as agreed with the Bank in the Selection Plan and specified in the Loan Agreement and for which that method may not be the most appropriate for selecting consultants may be procured with the use of the following selection methods: (ii) Quality Based Selection (QBS); (iii) Selection under a Fixed Budget; (iv) Selection Based on Consultants' Qualifications; and, exceptionally (v) Single-Source Selection.

Individual Consultants shall be employed for consultant assignments requiring specialized expertise following the provisions set forth in Section V of the Bank Selection Guidelines.

**Following is the table A3: CONSULTANT SELECTION ARRANGEMENTS (without contingencies)**

Consultant Services Expenditure Category	QCBS	QBS	SFB	LCS	CQ	Other	N.F.B.	Total Cost
A. Firms	7.94 (3.30)	0.83 (0.33)	0.05 (0.05)	0.15 (0.15)	0.20 (0.20)	0 0	3.19 0	12.36 (3.88)
B. Individuals	0 0	0 0	0 0	0 0	0 0	0.33 (0.33)	0 0	0.33 (0.33)
Total	7.94 (3.30)	0.83 (0.33)	0.05 (0.05)	0.15 (0.15)	0.20 (0.20)	0.33 (0.33)	3.19	12.69 (4.36)

**Prior Review Thresholds under the Lima Bus Transport and the GEF Grant:**

Table B summarizes the prior review thresholds for both the Lima Bus Transport Project and the GEF Grant. In the case of works, contracts over US\$ 500,000 and goods contracts of US\$ 250,000 will be subjected to prior review. For small works or goods contracts to be procured on the basis of three quotations from qualified contractors/suppliers, the first two contracts in each case will be subjected to prior review.

For consultants services awarded to firms, prior review will be needed for all contracts valued at more than US\$100,000, including TOR, RFP, short list, full review of technical and final evaluation reports, and negotiated draft contract. Prior review is also required for contracts awarded on a sole-source basis. For individual consultants, prior review is required for all contracts costing US\$50,000 equivalent or more.



**Table B: Thresholds for Procurement Methods and Prior Review<sup>1</sup>**

<b>Expenditure Category</b>	<b>Contract Value Threshold (US\$ thousands)</b>	<b>Procurement Method</b>	<b>Contracts Subject to Prior Review (US\$ millions)</b>
<b>1. Works</b>	(US\$ thousands) Contract = > 5000 5000 > Contract = > 250 Contract < 250	ICB NCB At least 3 quotations	(US\$ thousands) All Contracts = > \$500 Two first contracts each year
<b>2. Goods</b>	Contract = > 350 350 > Contract = > 50 Contract < 50	ICB NCB National Shopping	All Contracts = > 250 Two first contracts each year
<b>3. Services</b>			
3.1 Firms	Contract = > 100	QCBS	All TOR, RFP, shortlist of firms, full review of technical and final evaluation reports, and final negotiated contracts
	Contract < 100	QCBS, QBS, CQ, LC, FB, and SSS	TORs only
3.2 Individuals	Contract = > 50	IC	All TOR, CVs and Form of Contract
	Contract < 50	IC	TORs only

**Total value of contracts subject to prior review:**

**Overall Procurement Risk Assessment: High**

**Frequency of procurement supervision missions proposed: One every 6 months  
(includes special procurement supervision for post-review/audits)**

<sup>1</sup> Thresholds generally differ by country and project. Consult "Assessment of Agency's Capacity to Implement Procurement" and contact the Regional Procurement Adviser for guidance.

## **Annex 6(B): Financial Management and Disbursement Arrangements PERU: LIMA TRANSPORT**

### **Financial Management**

#### **1. Summary of the Financial Management Assessment**

##### ***Implementing Entities***

##### ***FONAM***

The GEF component of the project will be executed by *the Fondo Nacional del Ambiente-Peru* (FONAM) a private, not for profit entity, created by law. *Ley- Lima Peru, Partida No. 11196148*. FONAM is headed by a Steering Committee comprising representatives from both the public and private sectors. The Steering Committee reports to the Prime Minister's Office, (PCM). FONAM has previously executed a small grant for US\$ 350,000 for the preparation of the project, is also executor of grant from the United Nations Development Fund, *GEF-PNUD, US\$970,000*. and An institutional strengthening project funded by the InterAmerican Development Bank (IDB).

The Project Implementing Unit (PIU) will have primary responsibility for project coordination, monitoring and reporting. The proposed staff complement is a follows:- Executive Director, Coordinator-Administration and Accounting, Specialist in Disbursements and Accounting, Specialist in Procurement, Technical Coordinator, and three (3) engineers with individual responsibility for Institutional Strengthening, Promotions and Works.

##### ***PROTRANSPORTE***

The PIU was formed to respond to project needs and is currently staffed by core financial and administrative personnel.

The Project Implementing Unit (PIU) will have primary responsibility for project coordination, monitoring and reporting. The proposed staff complement is a follows:- Executive Director, Manager- Administration and Finance, procurement and General Services. (2), Concession Administrator, Budget Officer, Treasurer and Execution Control Officer. Accounting and Financial reporting will be handled by an outsourcing arrangement. Other Core operational areas to be involved in project implementation are Transport Planning and Project Management. AS the project evolves, there will be a need to gradually incorporate additional technical and administrative staff and there may be a need to re- evaluate the adequacy of outsourcing arrangements for accounting and financial reporting in the interest of development of capacity within the PIU, itself.

Establishment of both PIUs with appropriate staffing, organization systems, facilities and other resources in a manner satisfactory to the Bank will be a condition of grant effectiveness.

##### ***Executive Summary and Conclusion***

##### ***FONAM***

**Overall Assessment:** In general, the proposed Financial Management Arrangements for the grant are sound.

As a result of the assessment performed and the self – assessment which was prepared by the PIU, an extensive time-bound Financial Management (FM) action plan has been proposed and will be finalized during negotiations. Successful implementation of the action plan would result in adequate project FM arrangements in place by the effectiveness date.

**Risk Assessment:** Country specific risk has been assessed as *moderate* due to robust financial administration legislation, highly trained and dedicated staff in financial management posts and an integrated financial management system at national and sub-national level. Entity specific risk has been assessed as *substantial*, due to the newness of institutional and organizational arrangements for the project and limited financial capacity. Control risk has been assessed as *substantial*, since key personnel including financial management and procurement staff have not been hired and may be new to bank procedures and guidelines. Also, the PIU is still in the process of analyzing available alternatives for the implementation of integrated information systems.

Notwithstanding, successful completion of the FM Action Plan prior to effectiveness would result in an entity specific and control risk rating of *moderate* and in financial management arrangements which meet minimum Bank Requirements.

The major weaknesses observed include:

*Organization and Staffing:-* Key Personnel including Financial Management and Procurement staff have not been hired as yet. Limited experience in Bank-financed Projects and limited knowledge of bank guidelines and procedures.

*Information Systems:-* The entity is still in the process of analyzing available alternatives for the acquisition and implementation of an integrated information system.

The major strength observed:

*External Audit of Grant Funds:-* The auditors issued unqualified (clean) opinions on the Statement of Sources and Uses of Funds; on the Statement of Cumulative Investments, on the Statement of Requests for Reimbursement - SOE, and the balance and transactions of the Special Account Statement. In general, the auditors found that FONAM complied with the terms of the Grant Agreement and the applicable laws and regulations. Internal controls have been evaluated as satisfactory.

*Financial Accounting and Reporting:-* The PIU has been generating timely financial statements, supporting schedules and bank reconciliations. These are being submitted to the PIU's management for monitoring purposes.

## ***PROTRANSPORTE***

**Overall Assessment:** In general, the proposed Financial Management Arrangements for the loan are sound.

As a result of the assessment performed and the self – assessment which was prepared by the PIU, an extensive time-bound Financial Management (FM) action plan has been proposed and will be finalized during negotiations. Successful implementation of the action plan would result in adequate project FM arrangements in place by the effectiveness date.

**Risk Assessment:** . Entity specific risk has been assessed as *substantial*, due to the newness of institutional and organizational arrangements for the project and limited financial capacity. Control risk has been assessed as *substantial*, since key personnel are new to bank procedures and guidelines. Also, the PIU is still in the process of analyzing available alternatives for the implementation of integrated information systems.

Notwithstanding, successful completion of the FM Action Plan prior to effectiveness would result in an entity specific and control risk rating of *moderate* and in financial management arrangements which meet minimum Bank Requirements.

The major weaknesses/risks observed include:

*Organization and Staffing:-* Key Personnel including Financial Management and Procurement staff have not been hired as yet. No previous experience in Bank-financed Projects and limited knowledge of bank guidelines and procedures.

*Information Systems:-* The entity is still in the process of analyzing available alternatives for the acquisition and implementation of an integrated information system.

*Counterpart Funding:-* Counterpart funding could prove to be risky since changes of political commitment at the municipal level, could influence the availability of counterpart funds and thus implementation. The PIU has already obtained approval for the 2003 and 2004 budgets for the project.

*Sustainability of the MML's financial position:-* The audited financial statements and the indebtedness capacity assessment (Annex 14 of PAD) demonstrate risk of maintaining the MML's financial situation within a sustainable context. To mitigate this risk, a Fiscal and Financial Action Program (PAFF) has been recommended.

The major strength observed:

*Organization and Staffing:-* PIU Management and demonstrate strong commitment to compliance with Bank Procedures and Guidelines, notwithstanding their inexperience with same.

*External Audit of MML:-* For the year ended December 31, 2001. The auditors issued unqualified (clean) opinions on the Financial Statements of the MML.

*Financial Accounting and Reporting:-* The PIU has been generating timely financial statements, supporting schedules and bank reconciliations. These are being submitted to the PIU's management for monitoring purposes.

### ***Country Issues***

The Government has been committed to improving transparency and access to information and to promoting better governance and administration of public finances.

The Country Financial Accountability Assessment (CFAA) conducted in 2001 concluded that the financial tools at the disposal of the Congress and Executive Branch comprised (a) a robust financial administration

legislation (b) highly dedicated staff and (c) an effective integrated financial management system (SIAF).

The major recommendations of the CFAA, related to (a) more effective oversight by Congress of the budget process and review of the allocations of available funding (b) more detailed and frequent reporting on expenditures to Congress and (c) unfettered surveillance and reporting by the Controller General of the acts and reports of the executive.

Three (3) indispensable elements of a sound fiduciary framework were built into the CAS and policy framework for the Programmatic Social Reform Lending. (1) Strengthening of the congressional oversight of the use of public funds (2) Increased independence of the Controller General and (3) Expansion of the scope and coverage of the integrated financial management system SIAF.

During 2002 and 2003, the following have been the major major initiatives implemented by the Government of Peru:-

- Strengthened Legal Framework- Ley Orgánica del Sistema Nacional de Control y de la Contraloría General de la República- ley 27785 and supporting regulations,
- Timely financial and economic reporting through the Ministry of Economy and Finance Website,
- Expansion of the SIAF at Municipal level,
- Timely reporting of consolidated national accounts,
- Revision of accounting standards in line with IASC,
- Modernization of the Controller General's Office,
- Increased public access to information on government finances.

## **2. Audit Arrangements**

Annual project financial statements will be audited in accordance with International Standards on Auditing, by an independent firm acceptable to the Bank. The audit will be performed in accordance with terms of reference (TORs) approved by the Bank and the BID and comply with the requirements of the audit polices of both institutions.

The auditors would perform at least one interim visit per year. After each interim visit a memorandum on internal controls ("management letter") would be produced to ensure that corrective action is addressed prior to year end.

The PIU through the Controller General of the Republic, will appoint the auditors within two (2) months after loan effectiveness. Expenditures in respect of audit fees will be financed with loan proceeds under the consultants' services category.

Separate audits will be performed for each entity. The table below summarizes audit requirements:

<i><b>Audit Report</b></i>	<i><b>Due Date</b></i>
Project financial statements and other special statements ( as required)	6 months after the end of the reporting period (coincides with CY)

### **3. Disbursement Arrangements**

Each PIU will maintain and operate a Special Account in accordance with the requirements of the Bank's Disbursement procedures.

Disbursements will be transaction based (i.e. against Statements of expenditure (SOEs), full documentation, direct payments or special commitments). The Special Account maintained and operated by FONAM, will be held in the *Banco de Credito* in United States dollars. In the case of PROTRANSPORTE, this account will be held in *Banco de la Nación*. Deposits into the Special Account and replenishments up to the authorized allocation set out in the legal agreement would be made on the basis of applications for withdrawals prepared by the PIU and accompanied by the supporting documentation in accordance with Bank disbursement procedures.

The Special Account is only to be used for eligible expenditures under the loan (under no circumstances may funds in the Special Account be used to cover the share of expenditures corresponding to the counterpart). When payments are to be made, the Bank's portion of the expenses will be converted to local currency and transferred to a Local Currency account which the PIU will operate and maintain over the life of the project. This account will be used to issue checks or initiate transfers to the providers of goods and services, in accordance with the counterpart financing percentages agreed. Counterpart funds will be also deposited to the Local Currency account in accordance with Budget Allocations.

Upon request from the Borrower and subject to the Bank's approval, payments may be made: (i) directly to a third party (supplier or consultant) for goods, works, and services; (ii) to a procurement agent; or (iii) to a commercial bank for expenditures against a World Bank Special Commitment covering a commercial bank's letter of credit.

#### **Allocation of loan/grant proceeds (Table C)**

#### ***STREAMLINED FINANCIAL MANAGEMENT ARRANGEMENTS***

During the assessments of both PIUs, an attempt was made to offer advice that would result in streamlined project financial management arrangements for both PIUs. The descriptions which follow are therefore common to both PIUs, except were otherwise stated.

#### ***Accounting Policies and Procedures***

Both PIUs' will use the National Chart of Accounts- *Plan Contable Gubernamental del Sistema Nacional de Contabilidad*. In their present form, the Charts of Accounts do not capture the project design i.e project components, disbursement categories, financing sources, however, amendment of the Chart of Accounts is part of the proposed FM Action Plan. Accounts will be prepared using the cash basis and the accounting function will be computerized.

Planning and Budgeting will be in line with the general government procedures regulated by the Annual

Budget Law for 2003-2004. The operating and capital budget will be prepared and submitted for approval on an annual basis on or before October 31, each year.

Each PIU will operate and maintain all bank accounts for the project and will manage the payment cycle (invoice approval, payment authorization, check signing, check issuance and wire transfers, monthly bank and special account reconciliations).

The Financial Management Action Plan includes the finalization of the Operational Manuals for each PIU. Prior to issuing the Bank's no-objection to same, due care will be exercised to ensure that the project accounting system will have the capacity to record assets, liabilities, and financial transaction of the project, and produce financial statements which are both useful to project management and satisfy the IBRD's and BID fiduciary standards.

### ***Information Systems***

Both entities are still in the process of analyzing available alternatives for the acquisition and implementation of an integrated information system. Prior to effectiveness further work will need to be performed in order to evaluate the final proposal and the capacity to meet bank requirements for carrying out reporting, monitoring and reporting tasks for efficient project co-ordination and decision making.

### ***Internal Audits- PROTRANSPORTE ONLY***

Project transactions undertaken by PROTRANSPORTE will be subject to review by the Internal Audit Department (*Inspectoria General*) of the MML. The Internal Audit function is independent and reports to the country's supreme audit institution (*Contraloría General de la República-CGR*) and to the Mayor's Office. The Unit is staffed with experienced and trained professionals. The Scope and Coverage of the overall Annual Internal Control Plan will be expanded to cover project activities. The Unit prepares semi-annual reports which evaluate the corrective actions taken in response to Internal Control findings.

### ***Project and Financial Reporting***

FONAM:- The Executive Director is required to present administrative and financial reports to the Steering Committee, every two months. During the assessment the most recent copy of such a report, dated 15 March, 2003 consisted in four main areas; (1) a narrative report on the sources and used of funds received by the entity (2) Evaluation of the principal advances compared with the Business Plan, and (3) details of the 2003 budget proposal, (4) Update in organizational changes during 2002. The report was considered comprehensive and sufficient to keep the executive council, abreast of financial and administrative progress being made by the entity.

PROTRANSPORTE: The Executive Director is required to present administrative and financial reports to the Mayor's Office on a monthly basis.

For each PIU, Financial Statements, prepared on the cash basis, will follow National Norms which are acceptable to the Bank. In addition to monthly financial statements, the PIU will prepare semi-annual Financial Monitoring Reports (FMRs) comprising Project Financial Statements, physical progress and procurement sections. The Annual Financial Statements will include(i) the Statement of Receipts and Payments by Funding Source (with expenditures classified by budgetary line and/or disbursement category); (ii) Uses of Funds by Project Activities (including budget comparison); and (iii) the Special Account Reconciliation Statement. Finalization of the form and content of the FMRs and the systems and

procedures to be implemented in order to generate the reports are conditions of negotiations.

### ***Impact of Procurement Assessment***

The overall risk assessment for both entities is considered **high**. The Improvement Action Plans will address the key risks identified.

### ***Internal Audits- PROTRANSPORTE ONLY***

Project transactions undertaken by PROTRANSPORTE will be subject to review by the Internal Audit Department (*Inspectoria Gernerale*) of the MML. The Internal Audit function is independent and reports to the country's supreme audit institution (*Contraloría General de la República-CGR*) and to the Mayor's Office. The Unit is staffed with experienced and trained professionals. The Scope and Coverage of the overall Annual Internal Control Plan will be expanded to cover project activities. The Unit prepares semi-annual reports which evaluate the corrective actions taken in response to Internal Control findings.

### ***Supervision Plan***

Given the risk profile of both PIUs and the extensiveness of the Financial Management Action Plans, financial management supervision missions should be performed prior to effectiveness. This mission will focus in the Organizational Arrangements, and the Information and Reporting Systems which are to be implemented and involve an exhaustive review of the Accounting Systems and Procedures. During the first year of implementation it is recommended that two supervision missions be performed, to coincide with the semi-annual reviews of Financial Monitoring Report (FMRS). Thereafter on-going supervision should be through continuation of the FMR desk reviews, annual review of the external audit reports, and at least one supervision mission per year.

### ***Financial Management Action Plan***

In order to ensure satisfactory Financial Management Arrangements prior to effectiveness, the following action plan is proposed:



## **FONAM**

In order to ensure satisfactory Financial Management Arrangements, the following action plan is proposed:

<b>Activity</b>	<b>Responsible</b>	<b>Target Date</b>
<b>Organization and Staffing</b>		
Preparation and submission of TORS for PIU staff to bank for non objections.	FONAM	Prior to negotiations
Full staffing of the Project Implementation Unit.	FONAM	Prior to effectiveness
Participation of Project Financial Administration staff in Bank Disbursement and Financial Management Training.	BM/FONAM	Project launching
<b>Operational Manual</b>		
Submission of draft Manual to the Bank for review including institutional arrangements, staff functions, accounting policies and procedures, basis of accounting, chart of accounts tailored to include project components, disbursement categories and financing source, internal controls, segregation of duties, fixed assets and records management procedures.	FONAM	Prior to negotiations
Provision of comments and recommendations.	BM	Prior to effectiveness
Submission of revised draft to Bank to provide its no-objection.	FONAM	Prior to effectiveness
<b>External Audit</b>		
Preparation of TORs for audit and submission to Bank and for no-objection.	FONAM	Prior to effectiveness
Submission of approved TORS to CGR to initiate the process of selection and contracting of external auditors.	FONAM	Prior to effectiveness
Appointment of external auditors.	FONAM/CGR	Within three (3) months of effectiveness
<b>Safeguard over Assets (physical and information)</b>		
Implementation of Fixed Asset Policies and Procedures including physical inventories, storage/transfer/distribution/retirements of assets etc.	FONAM	Prior to effectiveness
<b>Financial Reporting and Monitoring</b>		
Finalization of format of FMRs and procedures for data collection and report generation of same, for the Bank to provide its no-objection.	FONAM	Prior to effectiveness
<b>Integrated Financial Management System</b>		
Implementation of Integrated Information system.	FONAM	Prior to effectiveness

## ***Financial Management Action Plan***

In order to ensure satisfactory Financial Management Arrangements, the following action plan is proposed:

### ***PROTRANSPORTE***

<b>Activity</b>	<b>Responsible</b>	<b>Target Date</b>
<b>Organization and Staffing</b>		
Preparation and submission of TORS for PIU staff to bank for non objections.	PROTRANSPORTE	Prior to negotiations
Full staffing of the Project Implementation Unit.	PROTRANSPORTE	Prior to effectiveness
Participation of Project Financial Administration staff in Bank Disbursement and Financial Management Training.	BM/PROTRANSPORTE	Project launching
<b>Accounting and Financial Reporting</b>		
Revision and Signing of Contract for Outsourcing which would provide accounting and financial reporting requirements satisfactory to the Bank	PROTRANSPORTE	Prior to effectiveness
<b>Operational Manual</b>		
Submission of draft Manual to the Bank for review including institutional arrangements, staff functions, accounting policies and procedures, basis of accounting, chart of accounts tailored to include project components, disbursement categories and financing source, internal controls, segregation of duties, fixed assets and records management procedures.	PROTRANSPORTE	Prior to negotiations
Provision of comments and recommendations.	BM	Prior to effectiveness
Submission of revised draft to Bank to provide its no-objection.	PROTRANSPORTE	Prior to effectiveness
<b>External Audit</b>		
Preparation of TORs for audit and submission to Bank and BID for no-objection.	PROTRANSPORTE	Prior to effectiveness
Submission of approved TORS to CGR to initiate the process of selection and contracting of external auditors.	PROTRANSPORTE	Prior to effectiveness
Appointment of external auditors.	PROTRANSPORTE/CGR	Within three (3) months of effectiveness
<b>Safeguard over Assets (physical and information)</b>		
Implementation of Fixed Asset Policies and Procedures including physical inventories, storage/transfer/distribution/retirements of assets etc.	PROTRANSPORTE	Prior to effectiveness
<b>Financial Reporting and Monitoring</b>		
Finalization of format of FMRs and procedures for data collection and report generation of same, for the Bank to provide its no-objection.	PROTRANSPORTE	Prior to effectiveness

**Table C: Allocation of Loan/Grant Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$million</b>	<b>Financing Percentage</b>
Works	29.71	41% or 82%
Goods	3.19	41% or 82%
Consultant's Services	4.36	82%
Training	0.25	41%
Microcredit Program	0.72	41%
Unallocated	6.32	41% or 82%
<b>Total Project Costs with Bank Financing</b>	44.55	
<b>Front-end fee</b>	0.45	
<b>Total</b>	45.00	

**Table D: Allocation of GEF Grant Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$ million</b>	<b>Financing Percentage</b>
Works in Lima	2.570	
Works in Callao	0.500	
Goods	0.180	
Bus scrapping Pilot Project	0.100	
Consultant's services	2.893	
Training	0.250	
Credit Guarantee Fund	1.000	
Microcredit Program	0.350	
Operating Costs	0.087	
<b>Total Project Costs w/ Bank Financing</b>	<b>7.930</b>	

**Use of statements of expenditures (SOEs):**

**Special account:**

---

<sup>2</sup> However, the largest works contract included in the Procurement Plan amounts to only US\$1,190,000.

<sup>3</sup> However, the largest goods contract included in the Procurement Plan amounts to only US\$ 70,000.

**Annex 7: Project Processing Schedule  
PERU: LIMA TRANSPORT**

<b>Project Schedule</b>	<b>Planned</b>	<b>Actual</b>
<b>Time taken to prepare the project (months)</b>		
<b>First Bank mission (identification)</b>		
<b>Appraisal mission departure</b>	06/09/2003	
<b>Negotiations</b>	10/22/2003	
<b>Planned Date of Effectiveness</b>	01/30/2003	

**Prepared by:**

Paul Guitink, Pierre Graftieaux, LCSFT; Oswaldo Patino, Consultant

**Preparation assistance:**

Gladys Sakata, Alexandra Orellana, LCSFT

**Bank staff who worked on the project included:**

<b>Name</b>	<b>Speciality</b>
Paul Guitink	Task Team Leader
Gerhard Menckhoff	Urban Transport Specialist
Oswaldo Patino	Institutional Specialist
Pierre Graftieaux	Urban Transport Specialist
Kirsten Oleson	Operations Analist
Keisgner Alfaro	Procurement Specialist
Isabella Micali Drossos	Lawyer
Elena Correa	Social Specialist
Meenakshy Santhadeevi	Social Consultant
Emma Cubillas	Procurement Analyst
Patricia Mc Kenzie	Financial Management Specialist
Xiomara Morel	Finance Officer
Elizabeth Dasso	Social Development and NGO Specialist
Sophie Sirtaine	Financial Specialist
Aurelio Menendez	Economist
Judy Baker	Peer Reviewer
Edward Dotson	Peer Reviewer
Walter Vergara	Peer Reviewer

**Annex 8: Documents in the Project File\***  
**PERU: LIMA TRANSPORT**

**A. Project Implementation Plan**

<b>Organismo</b>	<b>Documento / Estudio / Proyecto</b>
Protransporte	<ul style="list-style-type: none"> <li>▪ Estudios Técnicos y Ambientales del Corredor Segregado de Alta Capacidad - COSAC1</li> <li>▪ Estudio de Factibilidad del COSAC1</li> <li>▪ Estudio de Evaluación Ambiental Estratégica del COSAC 1</li> <li>▪ Lineamientos de Alternativas para la Reconversión Laboral de Trabajadores Impactados por el COSAC 1</li> <li>▪ Estudio de Tratamiento del Comercio Ambulatorio En el Área de Influencia del COSAC 1</li> <li>▪ Estudio de Alternativas de Diseño para la Plaza Grau y su conexión con el COSAC 1</li> <li>▪ Estudio de Auditoria de Seguridad Vial del COSAC 1</li> <li>▪ Lineamientos de Política Municipal de Transporte</li> <li>▪ Estudio de Evaluación Estructural, Diseño de Pavimentos y Plan de Mantenimiento del COSAC 1</li> <li>▪ Levantamiento Topográfico de la Vía Expresa</li> </ul>
Dirección Municipal de Transporte. DMTU-Lima	<ul style="list-style-type: none"> <li>▪ Proyecto de Tratamiento Integral del Sector 1</li> <li>▪ Reestructuración de rutas de la Av. Abancay</li> <li>▪ Plan de rutas de interconexión Lima-Callao</li> <li>▪ Base de Datos del Plan Regulador de Rutas</li> <li>▪ Registro Actualizado de Conductores y Cobradores</li> </ul>
Empresa Municipal Administradora de Peajes EMAPE	<ul style="list-style-type: none"> <li>▪ Proyecto de Ingeniería del Corredor Vial Almirante Grau (en ejecución)</li> <li>▪ Estudio de Factibilidad del Sistema Centralizado de Semáforos del Área Metropolitana de Lima</li> </ul>
Instituto Metropolitano de Planificación. IMP	<ul style="list-style-type: none"> <li>▪ Plan Metropolitano de Desarrollo Urbano</li> </ul>
Secretaría Técnica del Consejo de Transporte de Lima y Callao. ST-CTLC	<ul style="list-style-type: none"> <li>▪ Asistencia Técnica para Estudios de Transporte Urbano de Mediano Plazo</li> <li>▪ Proyecto de Diseño Operacional del Corredor Vitrina</li> <li>▪ Proyecto de Ingeniería Básica del Corredor Vitrina</li> <li>▪ Expediente Técnico para la Reestructuración de las Rutas de la Vía Expresa</li> <li>▪ Plan Estratégico de Transporte para el Área Metropolitana de Lima y Callao</li> </ul>
Autoridad Autónoma del Tren Eléctrico. AATE (hoy Metro de Lima)	<ul style="list-style-type: none"> <li>▪ Estudios de evaluación de alternativas de extensión de líneas del tren</li> <li>▪ Estudio de evaluación de rutas para el sistema</li> </ul>

	integrado Metro-Bus ■ Plan Maestro del Sistema de Transporte en Trenes para la Ciudad de Lima
Comisión Especial de Privatización – CEPRI Lima	■ Estudio de Evaluación de Alternativas de Localización de Terminales Interprovinciales para Lima

**B. Bank Staff Assessments**

**C. Other**

\*Including electronic files

## Annex 9: Statement of Loans and Credits

### PERU: LIMA TRANSPORT

24-Sep-2003

Project ID	FY	Purpose	Original Amount in US\$ Millions			Cancel.	Undisb.	Difference between expected and actual disbursements <sup>a</sup>	
			IBRD	IDA	GEF			Orig	Frm Rev'd
P055232	2003	PE- Rural Education	52.50	0.00	0.00	0.00	52.50	0.00	0.00
P065256	2003	PE NATIONAL RURAL WATER SUPPLY AND	50.00	0.00	0.00	0.00	49.29	4.29	0.00
P068250	2003	GEF PE PARTICIPATORY MGMT PROT AREAS	0.00	0.00	14.80	0.00	12.00	-0.80	0.00
P077788	2003	PE Trade Facil. and Prod. Improv. T. A.	20.00	0.00	0.00	0.00	20.00	0.00	0.00
P081834	2003	Lima Water Rehab Add'l Financing	20.00	0.00	0.00	0.00	20.00	0.17	0.00
P065200	2001	GEF PE Indigenous Management Prot. Areas	0.00	0.00	10.00	0.00	8.67	1.06	0.00
P044601	2001	PE SECOND RURAL ROADS PROJECT	50.00	0.00	0.00	0.00	33.01	0.78	0.00
P062932	2000	PE-HEALTH REFORM PROGRAM	80.00	0.00	0.00	0.00	19.93	-7.07	-7.07
P060499	2000	PE Indigenous Peoples Development (LIL)	5.00	0.00	0.00	0.00	3.88	3.88	1.42
P047690	2000	PE RES. & EXTENSION	9.60	0.00	0.00	0.00	3.62	-5.98	1.82
P039086	1999	PE URBAN PROPERTY RIGHT	38.00	0.00	0.00	0.00	6.62	6.62	0.00
P008037	1997	PE IRRIGATION SUBSECTOR PROJECT	85.00	0.00	0.00	0.00	12.58	12.58	5.59
P042442	1997	PE SIERRA NATURAL RESOURCES MANAGEME	51.00	0.00	0.00	0.00	4.87	4.87	0.00
P008051	1995	LIMA WATER Rehabilitation & Mgt. Proj.	150.00	0.00	0.00	0.00	0.49	0.49	0.21
<b>Total:</b>			611.10	0.00	24.80	0.00	247.46	20.89	1.97

PERU  
STATEMENT OF IFC's  
Held and Disbursed Portfolio  
June 30 - 2003  
In Millions US Dollars

FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
2001	Tecnofil S.A.	5.40	2.00	0.00	0.00	5.40	2.00	0.00	0.00
2001	UPC	7.00	0.00	0.00	0.00	7.00	0.00	0.00	0.00
1993/94/99	Yanacocha	20.00	0.00	0.00	35.00	10.00	0.00	0.00	35.00
2003	TIM Peru	70.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00
2000	Agrokasa	5.40	0.00	0.00	0.00	5.40	0.00	0.00	0.00
1999	Alicorp	17.33	0.00	20.00	14.29	17.33	0.00	20.00	14.29
2002	FTSA	7.50	0.00	1.50	0.00	7.50	0.00	1.50	0.00
2002	Gloria	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	ISA Peru, SA	17.66	0.00	0.00	7.70	17.66	0.00	0.00	7.70
2001	Inka Terra	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
1997	Interbank-Peru	8.00	0.00	0.00	0.00	8.00	0.00	0.00	0.00
2002/03	Interseguro	0.00	0.59	0.00	0.00	0.00	0.59	0.00	0.00
2000	Laredo	8.57	0.00	5.00	0.00	8.57	0.00	5.00	0.00
1998	Latino Leasing	6.04	6.46	0.00	0.00	6.04	6.46	0.00	0.00
2002	MIBANCO	2.33	0.00	0.00	0.00	2.33	0.00	0.00	0.00
1999	Milkito	3.50	0.00	3.50	0.00	3.50	0.00	3.50	0.00
0/84/91	Minera Regina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	Norvial S.A.	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	Paramonga	13.17	0.00	0.00	11.12	13.17	0.00	0.00	11.12
2001	Peru OEH	6.00	0.00	4.00	0.00	2.00	0.00	4.00	0.00
1994	Peru Prvtzn Fund	0.00	9.65	0.00	0.00	0.00	9.65	0.00	0.00
1994	Peru Prvtzn Mgmt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993/96/00/01	Quellaveco	0.00	0.75	0.00	0.00	0.00	0.69	0.00	0.00
1999	RANSA	8.13	0.00	0.00	0.00	8.13	0.00	0.00	0.00
	<b>Total Portfolio:</b>	<b>254.03</b>	<b>19.45</b>	<b>34.00</b>	<b>68.11</b>	<b>197.03</b>	<b>19.39</b>	<b>34.00</b>	<b>68.11</b>

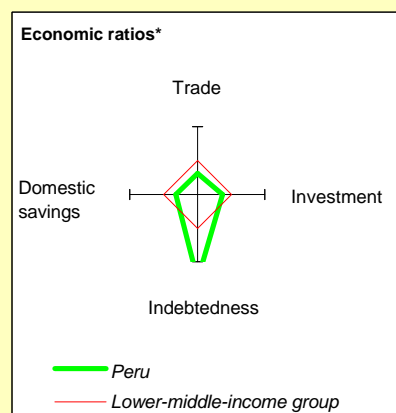
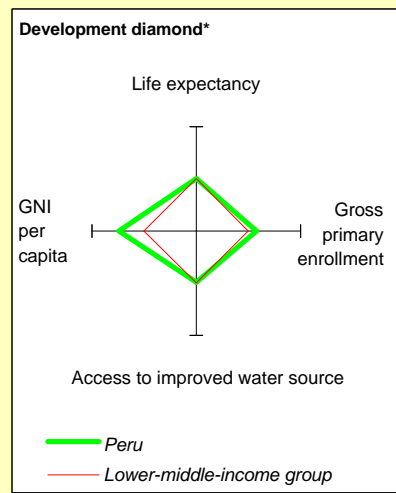
FY Approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic
2002	Inka Terra Swap	0.00	0.00	0.00	0.00
	<b>Total Pending Commitment:</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>



## Annex 10: Country at a Glance

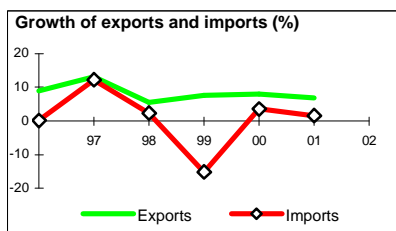
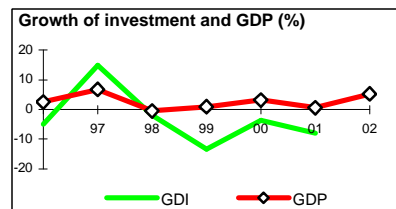
### PERU: LIMA TRANSPORT

	Peru	Latin America & Carib.	Lower-middle-income		
<b>POVERTY and SOCIAL</b>					
<b>2002</b>					
Population, mid-year (millions)	26.7	527	2,411		
GNI per capita (Atlas method, US\$)	2,060	3,280	1,390		
GNI (Atlas method, US\$ billions)	55.1	1,727	3,352		
<b>Average annual growth, 1996-02</b>					
Population (%)	1.6	1.5	1.0		
Labor force (%)	2.8	2.2	1.2		
<b>Most recent estimate (latest year available, 1996-02)</b>					
Poverty (% of population below national poverty line)	49	..	..		
Urban population (% of total population)	73	76	49		
Life expectancy at birth (years)	70	71	69		
Infant mortality (per 1,000 live births)	30	27	30		
Child malnutrition (% of children under 5)	7	9	11		
Access to an improved water source (% of population)	80	86	81		
Illiteracy (% of population age 15+)	9	11	13		
Gross primary enrollment (% of school-age population)	128	130	111		
Male	128	131	111		
Female	127	128	110		
<b>KEY ECONOMIC RATIOS and LONG-TERM TRENDS</b>					
	<b>1982</b>	<b>1992</b>	<b>2001</b>	<b>2002</b>	
GDP (US\$ billions)	24.8	36.1	54.2	56.9	
Gross domestic investment/GDP	33.6	17.3	18.3	..	
Exports of goods and services/GDP	16.5	12.5	15.8	..	
Gross domestic savings/GDP	30.5	14.4	16.9	..	
Gross national savings/GDP	26.4	12.4	16.5	..	
Current account balance/GDP	-6.5	-5.2	-2.0	..	
Interest payments/GDP	2.4	0.9	2.1	2.2	
Total debt/GDP	43.2	56.4	51.0	49.0	
Total debt service/exports	48.6	20.3	22.0	28.7	
Present value of debt/GDP	..	..	51.9	..	
Present value of debt/exports	..	..	282.7	..	
	<b>1982-92</b>	<b>1992-02</b>	<b>2001</b>	<b>2002</b>	<b>2002-06</b>
<i>(average annual growth)</i>					
GDP	-0.8	4.0	0.6	5.2	4.0
GDP per capita	-2.9	2.2	-1.0	3.7	2.4



#### STRUCTURE of the ECONOMY

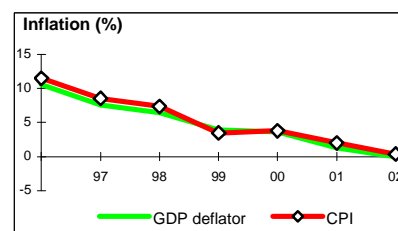
	1982	1992	2001	2002
<i>(% of GDP)</i>				
Agriculture	10.2	8.5	8.5	..
Industry	42.0	27.9	29.7	..
Manufacturing	36.2	17.7	15.3	..
Services	47.8	63.6	61.7	..
Private consumption	58.4	77.7	72.0	..
General government consumption	11.0	7.9	11.1	..
Imports of goods and services	19.5	15.5	17.2	..
	<b>1982-92</b>	<b>1992-02</b>	<b>2001</b>	<b>2002</b>
<i>(average annual growth)</i>				
Agriculture	1.7	6.4	-0.6	..
Industry	-0.1	4.8	0.7	..
Manufacturing	-0.3	3.4	-1.1	..
Services	-1.5	3.7	0.1	..
Private consumption	-0.5	3.7	1.3	..
General government consumption	-2.1	5.1	-0.5	..
Gross domestic investment	-1.1	4.2	-8.0	..
Imports of goods and services	0.0	6.1	1.6	..



\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

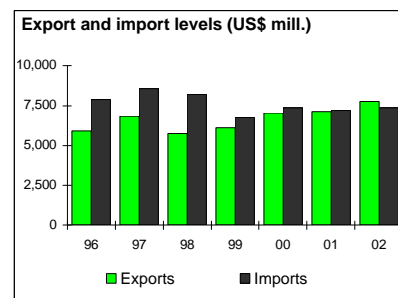
## PRICES and GOVERNMENT FINANCE

	1982	1992	2001	2002
<b>Domestic prices</b>				
<i>(% change)</i>				
Consumer prices	64.8	73.5	2.0	0.4
Implicit GDP deflator	65.2	69.2	1.2	0.0
<b>Government finance</b>				
<i>(% of GDP, includes current grants)</i>				
Current revenue	..	13.5	14.1	13.7
Current budget balance	..	-0.8	-0.6	-0.5
Overall surplus/deficit	..	-3.9	-2.8	-2.3



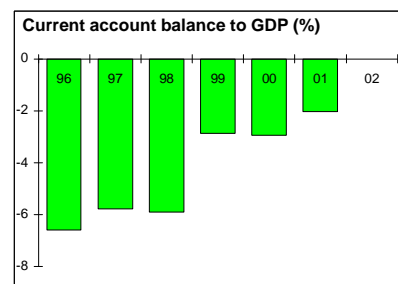
## TRADE

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total exports (fob)	..	3,661	7,108	7,751
Copper	..	756	987	1,110
Fishmeal	..	427	835	939
Manufactures	..	966	2,181	2,209
Total imports (cif)	..	4,001	7,198	7,374
Food	..	480	530	543
Fuel and energy	..	396	907	929
Capital goods	..	1,063	1,911	1,962
Export price index (1995=100)	..	85	79	80
Import price index (1995=100)	..	89	98	99
Terms of trade (1995=100)	..	96	80	81



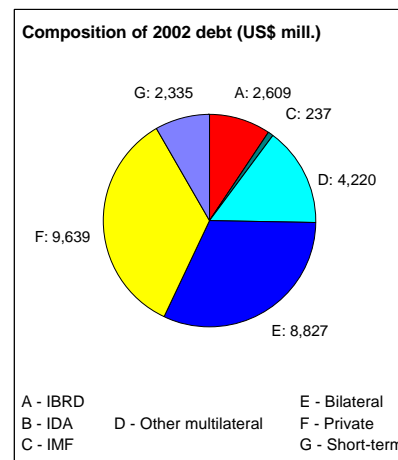
## BALANCE of PAYMENTS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Exports of goods and services	4,077	4,497	8,597	9,308
Imports of goods and services	4,436	5,412	9,487	9,819
Resource balance	-359	-915	-890	-512
Net income	-989	-1,635	-1,203	-1,506
Net current transfers	0	460	999	907
Current account balance	-1,609	-1,886	-1,098	..
Financing items (net)	1,525	2,455	1,546	..
Changes in net reserves	84	-569	-448	-340
<b>Memo:</b>				
Reserves including gold (US\$ millions)	..	3,365	8,930	9,102
Conversion rate (DEC, local/US\$)	6.98E-7	1.2	3.5	3.5



## EXTERNAL DEBT and RESOURCE FLOWS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	10,709	20,343	27,645	27,867
IBRD	478	956	2,626	2,609
IDA	0	0	0	0
Total debt service	2,036	1,004	2,190	2,755
IBRD	56	194	300	304
IDA	0	0	0	0
Composition of net resource flows				
Official grants	53	238	201	..
Official creditors	150	306	744	297
Private creditors	1,178	-97	294	1,436
Foreign direct investment	48	-79	1,064	..
Portfolio equity	0	0	42	..
World Bank program				
Commitments	378	1,150	230	100
Disbursements	85	0	149	146
Principal repayments	22	94	114	163
Net flows	62	-94	35	-17
Interest payments	33	100	186	142
Net transfers	29	-194	-151	-158



Note: This table was produced from the Development Economics central database.

8/20/03

## **Additional GEF Annex 11: Environmental Assessment - Summary Annex PERU: LIMA TRANSPORT**

### **Background**

The World Bank is financing an urban transport project that is part of a 15-year urban transport strategy in Lima, Peru. The main objective of the project is to establish an efficient, reliable and safe mass rapid transit system by implementing and operating high capacity buses in segregated bus corridors, which will improve public transport for the Metropolitan Lima population, especially for the low-income population of the peri-urban poor neighborhoods.

To achieve this, the project will: (i) help strengthen the Municipality of Lima's planning, regulatory, administration, and operational capacity of public transport provision for Lima and Callao (Metropolitan Lima) in the medium and long-term; (ii) rehabilitate and improve the existing road infrastructure, with emphasis on rehabilitation/construction of segregated bus corridors and feeder bus roads; and, (iii) enhance transport and environmental conditions by improving traffic management and safety, reducing air pollution and improving conditions for vulnerable road users, such as pedestrians, bicyclists and mobility constrained persons.

Parallel GEF funds will help facilitate greenhouse gases reduction from ground transport in the Metropolitan Area of Lima-Callao by contributing to the promotion of a long-term modal shift to more efficient and less polluting forms of transport, such as non-motorized transport and high-capacity public transport vehicles operated on segregated busways. The specific project objectives of the GEF supported activities are: (i) rationalization of public transport capacity by providing financial incentives (Credit Guarantee Fund) to retire old buses; (ii) consolidation of the bikeways pilot project developed in Lima North Cone mainly through the rehabilitation and extension of the existing bikeways; (iii) delivery of an institutional strengthening program on sustainable transport, targeting municipalities and institutions dealing with environmental issues and/or transport planning; and, (iv) to assess and monitor the GEF project global consequences.

The environmental and social benefits of the project are expected to be positive and widespread. The project is expected to positively affect the local and global environment through rationalization of key bus routes and traffic corridors, retirement of highly-polluting vehicles, improvements in traffic safety and upgrades to the urban environment throughout the city. First of all, the project will contribute to reductions in air pollution which will have a direct positive affect on public health. In 1998, more than 90% of medical admissions of children under 5 was due to respiratory infections, many of which can be attributed to air pollution and specifically to transport sector emissions. According to a study by the Peruvian Institute of Pneumology, one out of two transit police suffer from respiratory problems. Secondly, the project will result in a reduction in GHG and more specifically in CO2 emissions. Recent trends in Lima show an increase in used vehicle imports, a significant increase in the taxi and small bus fleets, and a reduction in the public transport modal share. Thirdly, the project seeks to remedy many of the unsafe traffic patterns plaguing the city by redesigning key traffic nodes, rationalizing public transport routes, enforcing concessions, improving flow patterns, and restricting illegal public transport along the corridor. Finally, the project contemplates many urban upgrades to improve areas surrounding the bus corridor, including commercial improvements, green spaces, architectural face-lifts, and enhanced protection of existing protected areas affected by the project.

This annex summarizes the findings of a number of environmental analyses done during project preparation, including the: i) Strategic Environmental Assessment of the Urban Transport Program in Lima (SEA), completed by ECSA Engineers (Peru); ii) corridor-specific Environmental Impact Assessment (EIA) covering the first investment phase of the program, completed by GETINSA (Spain); and, iii) environmental guidelines for the bus scrapping, completed by SWISSCONSULT (Switzerland).

Together, these documents cover all of the relevant environmental issues. They were submitted to the Bank for review and found to be satisfactory in terms of their treatment of the Bank environmental and social Safeguard Policies and other relevant guidelines.

The documents were all publicly discussed in various fora and are available for public review as described in detail below.

### **Legal Framework for Environmental Assessment**

While a multitude of environmental laws exist in Peru that are contradictory, reiterative, limited to one sector and non-specific, many contain important norms which must be applied. In 1990, a national code was passed on Environment and Natural Resources (DL No. 613). This Code was important in introducing the principles of environmental law, but does not deal directly with the transport sector. This law establishes that all projects which might degrade the environment must undertake an environmental impact assessment (Decreto Legislativo No. 613 Código del Medio Ambiente y los Recursos Naturales, Decreto Legislativo No. 757 Ley Marco del Crecimiento de la Inversión Privada). The law establishing the Environmental Impact Assessment System (Ley No 27446) was approved in April 2001, but is pending regulation. This gives specific guidance on the content of EIAs and on requirements for public consultation.

Under these laws, all large civil works must complete an EIA prior to initiation of activities. The EIA must be executed by public or private businesses that are registered and accredited by the corresponding sector. For this project, the consultants undertaking the EIA had to be accredited by the municipality.

The Metropolitan Government established a special procedure articulating the policies of both the financing institutions (World Bank and Inter-American Development Bank) to ensure establishment of acceptable procedures for EA and possible resettlement.

As the project is within the Province of Lima, the Government of the Province is the environmental authority. Its responsibilities include monitoring the EA throughout project formulation, execution and operation. The municipality must approve the EIA.

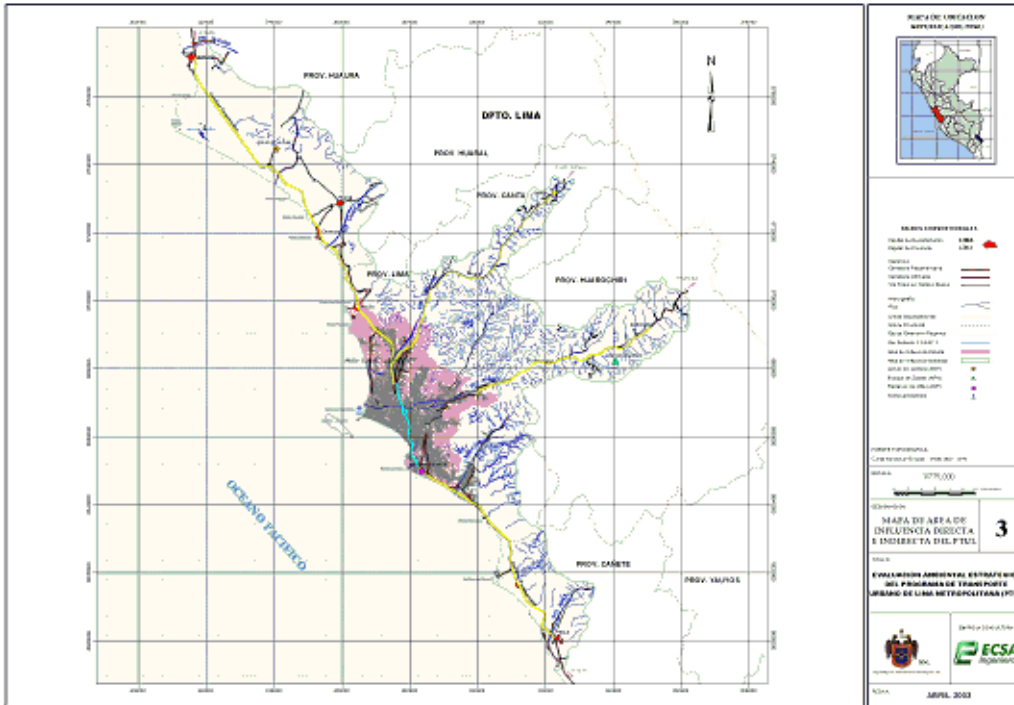
Peruvian environmental law does not consider the use of Strategic Environmental Assessment. Indeed, the law creating the national EIA system which was approved in 1997 deleted the SEA tool, as originally proposed by CONAM, likely due to the tool's complexity. However, aspects of the environmental and transport sector laws provide a legal basis for the SEA.

The municipalities that are affected and involved in the project do not have a legal framework governing environmental management. The municipality of Lima restructured its regulations and established a Municipal Department of Environmental Management in January 2003, only to repeal the reorganization in February 2003, reverting to the traditional structure of a Municipal Department of City Services, under which is an Ecology department.

The national Ministry of Transport was restructured in August 2002, a General Department of Socio-environmental Issues was established in the Vice Ministry of Transport, which has sub-departments specifically dealing with EA and expropriations/resettlement. However, the responsibility for reviewing EIAs for urban transport projects was decentralized to the municipalities and regions in May 2003.

**Environmental Baseline**

The area of influence of the project is the metropolitan area of Lima, as illustrated in the following map, which shows the bio-physical, urban/territorial and socioeconomic baseline conditions:



The estimated population of the metropolitan area is 8.2 million (2003). Of the 49 districts making up the metropolitan area, 13 are in a ‘high’ socio-economic strata (as defined by I.N.E.I.), 16 in medium and 20 in low. Between 50 and 70% of the population of Lima and Callao are estimated to use public transportation, equaling 11 million trips a day. According to official data (1995), 44% of the GDP of Peru was generated in the metropolitan area.

Lima is located along the Pacific coast, in the watersheds of the Lurin, Chillón and Rimac Rivers. The rivers have an irregular flow, dependent upon the seasonal rains. The Rimac supplies approximately 60% of the potable water for the city, and is also the main water source for many industries, irrigation and hydroelectric plants.

Geologically, the city is located in an area that is characterized by soft soils, a steep elevation change (5000 meters over 120 km), and numerous geological fault lines. Significant seismic activity has occurred about 20 times over the past 450 years, the most recent event occurring in May, 1993. Other natural disasters which occur in the area of influence include huaycos, laminar scouring of the rivers, landslides, floods and tsunamis.

Land use in the area of influence is a mixture of urban, agricultural and natural habitat. The city has grown rapidly, resulting in marginal areas without basic services, especially in the north and south of the city. The population of Lima has a low density, about 108 inhabitants per hectare (1997). Most of the agricultural areas in the Rimac River watershed have been converted into urban area, and the Chillón watershed is quickly following suit. The areas in the direct area of influence are a mix of consolidated urban areas and transitional areas.

Steep hills, dunes, and streambeds throughout the urban area are where most natural vegetation occurs. Vegetation in non-irrigated areas is limited to cactus and other plants which can survive in the arid conditions. The urban area is disorganized, growing at an average rate of 3% per year. Lima possesses 14 million m<sup>2</sup> of green areas, which represents 0.5% of the territory, and a density of 1.98 m<sup>2</sup>/inhabitant [WHO guidelines recommend 8m<sup>2</sup>/inhabitant].

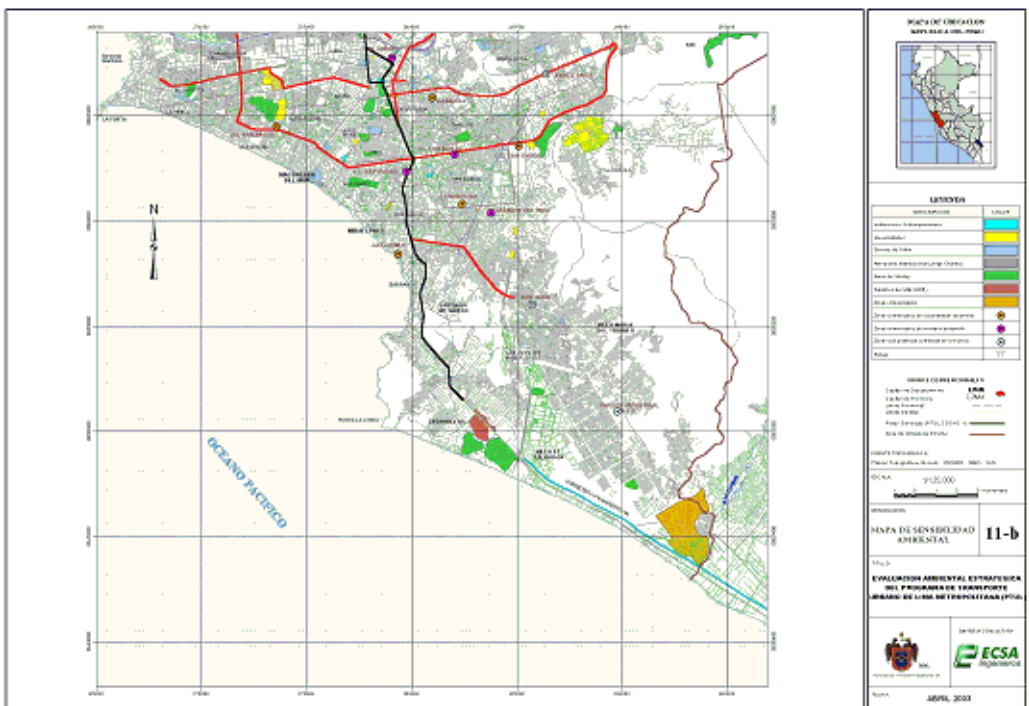
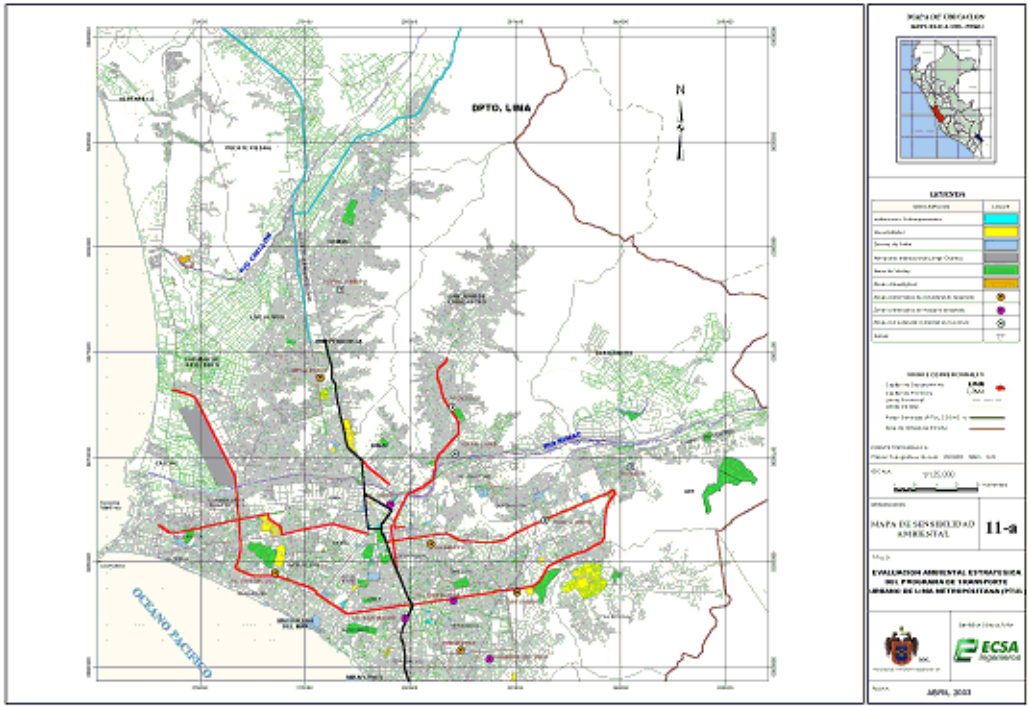
Vegetation density is low in the altitudes less than 1,300 msl, which is characterized as desert. Above 1,300 msl, more biodiversity is present due to a slightly higher rainfall. During the seasonal rains, vegetation which normally is absent begins to grow. In the direct area of influence, vegetation is restricted to trees, shrubs and other plants in green areas. Along the periphery of the project, some agricultural land exists. Fauna in the area of influence are common species. No endangered species were encountered.

Lima has many sites of archeological and cultural significance. Archeological sites such as temples are scattered throughout the city. The historic city center contains many important buildings and is designated a historic area by the Municipality.

In the area of influence, there are a number of protected areas: the Pantanos de Villa, National Reserve Lachay, Valle de Lurin and Zarate Forest. Pantanos de Villa, a designated RAMSAR site, will be directly affected by the project.

Aside from improper land use, another key environmental issue in the metropolis is air pollution, primarily due to the transport sector, industry and clandestine burning of solid wastes. The main problem is suspended solids, which causes significant public health problems. Noise pollution due to overuse of horns is another major issue related to the transport sector.

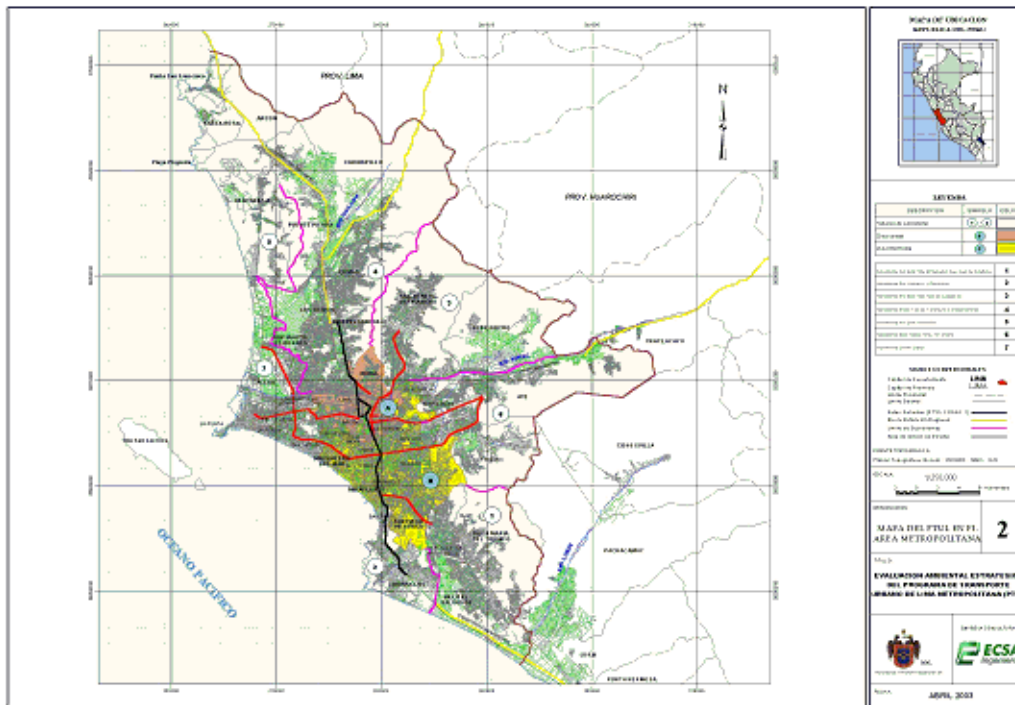
The sensitive urban areas are illustrated in the following maps:





## Project Description

The Project will finance a first phase, which includes a basic network of segregated high capacity bus corridors of more than 29 km that will provide service to the low-income population segments who need an efficient, low-cost and affordable transport service. The project extends 29 km from the intersection of Av. Tupac Amaru and Av. Naranjal in the Independencia District to the north, to Av. Prolongacion Huaylas at the border to the Pantanos de Villa Park, in the Chorrillos District to the south. The basic high capacity network consists of bus corridors with operational and functional compatibility with follow-up phases, and will be using existing road corridors, while bus-stops and feeder-trunk route transfer terminals will be newly constructed. In addition to the 29 km of bus lanes, the projects will construct 36 bus stops, 2 terminals at the north and south, and 2 parking and maintenance areas. Apart from compatibility between phases, each of the sections is expected to be functionally, economically, and operationally self-sustainable. The Project will also invest in the construction of access routes to terminals, focusing on accessibility for pedestrians and bicycles.



Along the high capacity corridors horizontal and vertical road markings will be rehabilitated, including an overhaul of the traffic lights. While road safety improvement forms a separate component, implementation of road safety audit recommendations will be included under various civil works.

Monitoring of air quality will take place through the establishment of an air quality monitoring network which includes operation and maintenance. The project will also prepare the business plan for the bus service concession; develop the fare collection system and its adjustment conditions; support the creation and strengthening of an operations entity; and assist in the development of an efficient organizational structure for the municipal management of urban transit and transport. Within the framework of the latter, the project will also provide support to MML's transport agencies to develop well-defined responsibilities, coordinated management and resource utilization, as well as transport performance monitoring and control



mechanisms.

In addition, the project is supporting a number of complementary studies which will have environmental benefits. One, supported by the U.S. Department of Energy, is determining the feasibility of using alternative fuels. The second, supported by USAID, is for environmental education and monitoring.

### **Special Design Considerations for Disabled Persons**

Architectural and engineering designs of the project will include specific measures for disabled persons. Some of the important measures foreseen include: i) adequate dimensions of sidewalks for wheelchair access; ii) special signage indicating disabled access; iii) access ramps of no more than 8%; iv) in the case of elevated bus stops, elevators; v) all pedestrian bridges will include or be retrofitted with access ramps; vi) at the terminals, if bathrooms are included in the final design, special stalls will be installed; and vii) measures for deaf and blind passengers including sounds indicating oncoming buses, a contrasting color scheme, and textured surfaces.

### **Strategic Environmental Assessment of Program**

The SEA seeks to orient the environmental management of the program as a whole during the planning, construction and operational phases. The SEA analyzed the socio-political, regulatory and institutional frameworks and evaluated the potential economic, social, environmental and territorial implications of the program. Based on a detailed diagnostic at both the regional and specific levels, an integrated analysis was done based on alternative scenarios. A round of public consultation was held, including focus groups and in-depth interviews. Finally, the SEA presents a Management System for Environmental Management.

#### *Environmental and social impacts*

The SEA analyzed the following impacts, benefits and risks of the program:

- Alteration of land use in both urban and rural areas;
- Improvements to the competitiveness and economic efficiency of the city;
- Reduction in transport costs and impact on external economies;
- Improvements in the quality of service and culture of transport;
- Involuntary displacement of business and people;
- Reduction in urban pollution;
- Improvements in public perception of the urban environment;
- Institutional and legal framework inadequacies; and,
- Strengthening of the urban transport system

## **Environmental Impact Assessment of Corridor**

### *Environmental impacts*

Most of the environmental impacts which were identified in the EIA are due to the construction phase of the project. These include increased levels of air, soil water and noise pollution, limitations on traffic circulation, interruptions in services, harm to existing green areas, and others.

Possible impacts during operation include air, noise, soil and water contamination from the terminals and parking/maintenance areas, increased pressure on the protected area Pantanos de Villa, and increased accidents due to improper design.

Environmental benefits predicted by the EIA include a rationalization of the 'collective' transport system, a decrease in travel time, and the reduction of air and noise pollution.

### *Social impacts*

The EIA identifies the main social impacts as those related to employment and social security. The impact on displacement and/or reduction of informal commerce is discussed.

Social benefits outlined in the EA include improved comfort and security for passengers, generation of employment during construction and operation, a new culture related to transport, and a new participatory civic culture.

### *Impacts on cultural heritage*

The only archeological site proximate to the corridor is the Pampa Cueva, located at the intersection of Avenida Tupac Amaru and Avenida Las Americas. The culturally historical centers of both Lima and Barranco-Chorillos affected by the project are legally protected by the National Cultural Institute. The EIA does not predict that construction or operation to have a negative impact on any of these sites.

## **Environmental Guidelines for Bus Scrapping**

These guidelines were developed to ensure that the vehicle scrapping program is implemented in an environmentally-friendly manner, guaranteeing proper disintegration of the buses, reuse/rehabilitation of parts and final disposal.

### *Environmental impacts*

Impacts possible from the physical scrapping of the buses include ground and water contamination from improper handling and disposal of liquid and solid wastes, including parts containing hazardous materials such as heavy metals, and improper management of recycling operations. Public safety could be affected should defective parts be allowed to re-enter the market after scrapping.

## **Safeguard Policies Triggered and Handling Thereof**

### *O.P. 4.01 - Environmental Assessment*

The policy is triggered due to the potential environmental impacts of the project. Numerous environmental analyses were completed during project preparation to ensure proper handling of potential impacts, and to ensure that potential environmental benefits are capitalized upon. As described above, the SEA takes a broad, regional approach to the program as a whole. The EIA studied the environmental impacts of construction of the corridor. Operational guidelines for bus scrapping were developed to ensure proper environmental management of this component. The EMP is a combination of the recommendations from these studies. In addition to the required mitigation measures, many environmental activities are integrated

into the project.

#### *O.P. 4.04 – Natural Habitats*

This policy is triggered due to the situation of the southern terminal near the edge of an existing protected area, Pantanos de Villa. The wetlands will not be directly affected by the project, but an indirect impact could be increased pressure from easier access due to public transport and higher volume of private transport that is going to the terminal. A program is included in the EMP to support the master plan of the park, under implementation since 1998. Activities foreseen include reinforcing the surrounding perimeter, building walkways, better signage and others.

#### *O.P.N. 11.03 – Cultural Property*

The corridor-specific EIA analyzed the impact that the project would have on cultural heritage of Lima and determined that no sites . A program is included in the EMP that provides for protection of existing cultural heritage and procedures for chance finds. All procedures that will be included in the program will follow criteria set by the National Institute of Culture.

#### *O.P. 4.12 – Involuntary Resettlement*

The project has developed an abbreviated resettlement plan for the 72 businesses located in the Flower Market which will be moved due to construction of the terminal. The plan establishes: the number and socio-economic condition of the current businesses, the new area where the stalls will be relocated (the area is adjacent to the current area) and a proposed design of the new market, the procedure for assigning the new stalls, the consultation process for gaining agreement on the final design from the businesses, and possible compensation of lost income during construction. The plan is included in the social impact annex.

The EIA established, and the SEA confirmed, that the initial phase of COSAC will not cause any other involuntary resettlement as the construction is along existing roadways. While not considered involuntary resettlement, the project has addressed negative social impacts on groups whose income will be affected by the project, namely informal and formal businesses along the corridor and bus operators.

A special study was completed to assess the impact on informal and formal businesses along the corridor. This study proposes an extensive plan to mitigate impacts on these businesses. The plan includes relocation, training, and compensation. A summary of the report is included in the social annex.

Another special study was completed to assess the impact on operators of loss of income due to the elimination of their bus routes and scrapping of their buses. A plan is proposed for re-training for other jobs within the transport sector, and a small fund for microcredits will be established to mitigate the impacts.

### **Public Consultation and Disclosure**

The SEA was consulted via focal groups and in-depth interviews with stakeholders. Focus groups included users of the transport routes and operators. People were interviewed from various agencies to understand opinions, perceptions and thoughts about public transport and possible civil society involvement during implementation of the program. Details of the consultations are in project files. The executive summary of the SEA will be put on the PROTRANSPORTE website.

The EIA was consulted in various workshops during its elaboration. The EIA is available on the website of PROTRANSPORTE ([www.protransporte.org.pe](http://www.protransporte.org.pe)). To date, more than 200 hits have occurred to download the comments, and more than 45 CDs with the website have been distributed to interested parties.

Comments have primarily been minor and non-substantive. Records of the public consultation are available in project files.

The Guidelines for bus scrapping were discussed in workshops in November 2002, where stakeholders from many areas were present. Details of these meetings, including attendance lists, are available at FONAM. The Guidelines were posted on the website of FONAM ([www.fonamperu.org](http://www.fonamperu.org)).

This annex will be posted on the INFOSHOP of the World Bank prior to appraisal to fulfill the disclosure requirements.

### **Environmental Management Plan (EMP)**

The project integrates environmental aspects throughout all components. The table presented in Appendix 1 of this document illustrates the recommendations from the SEA and EIA, the recommended amounts for implementation of the various mitigation programs, and a comment section that indicates in which component the measure has been integrated.

While all activities listed are important to ensure the sustainability of the project, certain key activities in the EMP have strict deadlines to ensure their implementation in a timely manner as per national law and Bank policies:

- procedures for chance finds to be developed prior to opening of any bid for works;
- Construction manual with environmental specifications approved by the Bank prior to opening of any bid for works (this will be part of the standard bidding documents that the Bank will approve);
- Pantanos program designed and implementation begun prior to contract signing for southern portion of corridor;
- Mitigation of operators plan approved before opening of the concession bidding process. The plan must have chronogram where all affected people are taken care of before start of operation of corridors;
- Mitigation of ambulantes plan approved before opening of the bidding process for the works. The plan must have chronogram where all affected people taken care of before signing of contract; and,
- Resettlement plan final design must be finished and negotiated with all affected people prior to opening of bidding process for that segment of the corridor, everyone must moved before signing the contract for works.

The possible environmental impacts from bus scrapping are addressed in the Guidelines. The buses will be scrapped in a designated area, wastes will be collected and disposed of following international and national regulations. Parts will be categorized according to their appropriate handling and final disposal. As appropriate, parts such as batteries, glass, and oil will be recycled. Radiators, alternators and compressors will be sold to shops that will recycle the parts. Metal from the motor, chassis and transmission will be recycled. Materials will only be sold to licensed, formal businesses to ensure proper environmental procedures during recycling and disposal. Small amounts of material that are not recyclable, and tires, will be sent to a sanitary landfill. Following the established guidelines and proper operational safety measures for workers will be a requirement of the concession. Audits of the scrapping, recycling and disposal

operators will be done at an appropriate interval to be determined.

The project will partially finance the design and placement of an air quality monitoring network in the area of influence of the project. To support this effort, the project will also finance a study on the environmental baseline prior to initiation of the works, an inventory of the emissions from the vehicle fleet, and a consolidation of historical data on air quality.

### **Policy Discussions**

The success and sustainability of the program depend on a number of policy changes that the municipality must adopt. Within this discussion, issues such as the technical inspection of vehicles, the renewal plan of the vehicle fleet, and a change in the quality of fuels will be included.

### **Institutional Capacity to Implement EMP**

PROTRANSPORTE will be the key agency responsible for monitoring the implementation of the EMP. A department responsible for EMP implementation and monitoring will be included in the implementing agency, with appropriate competencies.

The template bidding documents for works will be approved by the Banks to ensure inclusion of all necessary environmental considerations.

A beneficiary impact assessment, to be undertaken during implementation, will develop an integrated strategy to identify and address social impacts of the proposed project in the project influence areas and to develop a framework to incorporate participation of various categories of stakeholders during various stages of the project cycle.

An independent auditor will supervise the implementation of the EMP, reporting directly to the Banks three times a year. The auditor will monitor all aspects of the EMP.

## Appendix 1 – Environmental Management Plan

IMPACT IDENTIFIED	PROGRAM	ACTIVITY	INSTITUTIONAL RESPONSIBILITY	COST [all costs to be confirmed during appraisal]	COMMENT	TIMING
	<b>Programa de integración de asuntos ambientales en el diseño del COSAC</b>	Medidas de localización y diseño de patios y terminales contra el aumento de las emisiones de gases contaminantes producidos en estos	PROTRANSPORTE  Ingenieros que hacen el diseño final		EN COMPONENTE DE INGENIERIA	
		Medidas de localización y diseño de patios y terminales contra el aumento de los niveles de ruido en las proximidades de estos.				
		Medidas para minimizar la afección a los elementos conmemorativos y la vegetación ornamental.				
		Medidas para minimizar afecciones de tráfico en obras y operación Medidas contra la interrupción de servicios				
		Medidas de diseño para disipar el riesgo de accidentes en las proximidades de Caquetá.				
		Medidas de diseño respecto a la seguridad del corredor, paraderos y terminales.				
		Prospección arqueológica de los patios				
Impactos negativos sobre el medio ambiente y medio social durante construcción	<b>Programa de control de los impactos durante construcción</b>	Proyecto de control de tráfico en fase de construcción	Contratista		EN COMPONENTE DE INGENIERIA	
		Medidas para reducir el incremento de la contaminación atmosférica debido a las actividades de obra				
		Medidas para reducir el incremento del ruido debido a las actividades de obra				

		Medidas para reducir la afección medioambiental por disposición inadecuada de residuos de la construcción				
		Medidas para reducir el impacto de ocupación del espacio urbano en fase de construcción				
		Medidas contra la afección al sistema vial por maquinaria de obras				
		Medidas contra la interrupción de servicios				
		Proyecto de control de tráfico en operación				
		Rehabilitación de las infraestructuras básicas afectadas: reposición de servicios				
Disminución de los niveles de ruidos (dB), la emisión de contaminantes atmosféricos (material particulado y gases), debido a que se introducirán nuevos elementos de modernización tecnológica del transporte, que determinará un parque automotor más eficiente	<b>Programa de control ambiental durante la fase de operación</b>	Uso de tecnología moderna	PROTRANSPORTE Concesionario			
Disminución de la contaminación por residuos de lubricantes, grasas y aceites.  Contaminación de los suelos en zonas donde se emplazarán los terminales y garajes proyectados en el PTUL, debido al inadecuado manejo de los residuos peligrosos durante el mantenimiento de los vehículos		Medidas para proteger el acuífero y suelo respecto del manejo de elementos contaminantes en los patios				
		Medidas de mantenimiento del corredor				

El manejo de las unidades de transporte bajo un mismo sistema de mantenimiento y operación permitirá efectuar importantes economías, aumentando la eficiencia energética, evitando el desperdicio de energía en las horas de mayor congestión-amiento			Gremios y Asociaciones, TRANSMET, Ministerio de Vivienda, Construcción y Saneamiento, Municipios Distritales, DMTU			
Acceso mas fácil y manejo inadecuado del parque Pantanos de Villa, y mal control de uso de suelo, resulta en deterioro del parque	<b>Programa de gestión ambiental para los Pantanos de Villa</b>	Implementación de algunas actividades claves en el existente Plan de Manejo del Parque	PROTRANSPORTE	80.000	COSTO ASUMIDO POR COMPONENTE AMBIENTAL	
Falta de conciencia ambiental entre la población local	<b>Programa de comunicación social</b>	Estudio de planificación y ejecución de la comunicación masiva a la población	PROTRANSPORTE Municipalidades distritales Ministerio de Educación. Medios de Comunicación Universidades Centros educativos	17,000	EN COMPONENTE SOCIAL	
La implementación del PTUL, permitirá mejorar la calidad de vida y desarrollo humano de los usuarios, por cuanto tendrá mayor disponibilidad de tiempo para desarrollar otras actividades. Así mismo, el operador mejorará su autoestima y calidad de vida y estará en mejores condiciones de prestar un buen servicio.  El PTUL, contribuirá de manera importante en la construcción de una nueva cultura urbana que se identifica con su ciudad y en particular una nueva cultura del transporte.	-	Diseño y implementación de la estrategia de comunicación a organismos, autoridades, representantes y líderes de opinión y ejecución		17,000	EN COMPONENTE SOCIAL	



		Equipo de comunicación a la población directamente afectada		33,000	EN COMPONENTE SOCIAL	
		Oficina de Información y Quejas.		33,000	EN COMPONENTE SOCIAL	
	<b>Programa de revalorización urbana a lo largo del corredor</b>	Proyecto de inserción urbana del corredor y áreas segregadas		1,750,000	EN COMPONENTE DE INGENIERIA	
		Proyecto de ordenación del comercio informal		750,000	EN COMPONENTE DE INGENIERIA	
		Proyecto de reposición de vegetación y elementos conmemorativos a lo largo del corredor		12.000	EN COMPONENTE DE INGENIERIA	
El PTUL resulta en la reubicación del mercado de flores.	<b>Programa de reubicación del mercado de flores</b>	Diseño final y ejecución del proyecto de reubicación	PROTRANSPORTE	180.000	EN COMPONENTE SOCIAL	
Incorporará e un sector de los actuales operadores en las rutas del PTUL y las alimentadoras que requerirán incentivos para su ingreso al sistema.  El PTUL, dejará fuera del sistema de transporte urbano a un número de operadores produciendo pérdida de empleos.  Desplazará a operadores de transporte y actividades vinculadas hacia otras actividades económicas requiriendo capacitación y asesoría.	<b>Programa apoyo a operadores</b>	Diseño final y ejecución del proyecto de mitigación impactos sobre los operadores	Ministerio de Trabajo ESAN y universidades SENATI PROMPYME COFIDE COPEME, EDPYMES Gremios de PYMES Agencias de Cooperación Técnica Internacional	2.000.000	EN COMPONENTE SOCIAL	
El PTUL afectará actividades de terceros: comercio formal e informal y viviendas en las áreas en que se requerirá realizar trabajos de ampliación de vías.	<b>Programa apoyo a comercio ambulatorio</b>	Diseño final y ejecución del proyecto de mitigación sobre los ambulantes	Ministerio de Trabajo ESAN y universidades SENATI PROMPYME COFIDE COPEME, EDPYMES Gremios de PYMES Agencias de Cooperación Técnica Internacional	120.000	EN COMPONENTE SOCIAL	

<p>El caos que genera el desorden del transporte público actúa como efecto barrera (psicológica), que impide transitar libremente de un extremo a otro de Lima Metropolitana, a sectores de población que por sus mejores niveles de ingresos se sienten agredidos por el medio ambiente urbano.</p>	<p><b>Programa de concienciación social y seguridad vial para el corredor</b></p>		<p>Municipios distritales, Municipalidad Metropolitana de Lima, MDTU</p>	<p>500.000</p>	<p>EN COMPONENTE SOCIAL</p>	
<p>Mejorará la percepción de la calidad paisajística urbana de la población en general, por la implantación de un tránsito urbano ordenado, sin congestión, con un diseño vial planificado y con una mayor cobertura vegetal.</p>						
<p>La implementación del PTUL, determinará la mejora en la calidad del servicio de transporte al usuario, brindándole condiciones de seguridad, facilidad de acceso, entre otros beneficios</p> <p>Mejorará la calidad de los servicios en términos de comodidad, limpieza, seguridad e información para los usuarios, mejorando de esta manera, la percepción del hábitat urbano de la población y de los usuarios del sistema de transporte.</p>	<p><b>Programa de vigilancia y protección al usuario</b></p>		<p>CONAM, Consejo de Transporte de Lima y Callao.</p>	<p>500.000</p>	<p>EN COMPONENTE SOCIAL</p>	
<p>Falta de capacitación ambiental de los funcionarios de la MML, de las empresas contratistas y de los operadores del sistema</p>	<p><b>Programa de fortalecimiento institucional</b></p>					

Desajuste inicial de la gestión municipal del transporte público, como efecto del cambio sustantivo que producirá el COSAC-PTUL en el sistema.	<b>Programa de fortalecimiento institucional</b>	Sub-programa de fortalecimiento institucional de MML	Municipalidades distritales  Gremios de Transportistas  Organizaciones de la Sociedad Civil			
Oportunidad para la MML a fin de establecer y fortalecer canales de comunicación y participación con los operadores y con los usuarios para lograr el ordenamiento del Transporte Público.  Desafío a la MML para abordar una gestión ambiental estratégica.  Plantea la necesidad de asumir un mayor liderazgo de la MML sobre instituciones metropolitanas  Ejecución y operación de COSAC – PTUL exige a la MML recursos y mayor alcance de sus propias funciones	<b>Programa de fortalecimiento institucional</b>	Subprograma de Interacción con los Organismos Gubernamentales y de Adecuación de la Legislación Urbana y Ambiental				
Modificará y condicionará el uso y la ocupación del suelo urbano  Alterará y condicionará el uso del patrimonio histórico cultural, especialmente en el Centro Histórico de Lima	<b>PROGRAMA DE GESTION TERRITORIAL</b>	Subprograma de Gestión Territorial en Áreas del Casco Urbano de Lima Metropolitana	350.000	Municipalidades Distritales. Ministerio de Turismo.  INC		
Acelerará el proceso de crecimiento extensivo hacia las áreas suburbanas y/o periféricas  La ocupación extensiva del suelo urbano presionará sobre las tierras con uso agrícola mediante la subdivisión de parcelas		Subprograma de Gestión Territorial en Áreas de Borde del Casco Urbano de Lima Metropolitana	350.000	Municipalidades Distritales. Ministerio de Vivienda y Construcción.  INRENA		

Establecimiento de los beneficios justifica el proyecto	<b>Programa de monitoreo de control de contaminación atmosférica y control de ruido</b>		850.000	COSTO ASUMIDO POR COMPONENTE RED DE MONITOREO		
Establecimiento de los beneficios justifica el proyecto, incluyendo emisiones con y sin proyecto, consolidación de data de calidad de aire disponible, análisis epidemiológicos asociados a las emisiones vehiculares	<b>Asesoría de beneficiarios del proyecto y línea base ambiental</b>					
Establecimiento independiente de la implementación del PMA y monitoreo externo de los impactos y beneficios ambientales y sociales da confianza pública	<b>Auditoría ambiental</b>	Auditoría del estatus de la implementación del PMA cada 6 meses				

## RECOMENDACIONES ESTRATEGICAS PARA LA EJECUCION DEL COSAC I

<u>Problema</u>	<u>Recomendación Estratégica</u>
<p>En el tramo Norte del COSAC I, se estima que la ubicación del terminal en Av. Naranjal, podría dejar sin acceso a la troncal de la parte media y alta del subsistema. Esto podría colocar a las líneas alimentadoras en desventaja respecto de la oferta informal, ya que esta última tiene la ventaja de acceso y de origen-destino puerta. Se estima que de un total de 538,601 viajeros, más de 281,000 pasajeros (52%) utilizarán las rutas alimentadoras que son extensión de la troncal<sup>[1]</sup>.</p>	<ul style="list-style-type: none"> <li>● Se debe estudiar la posibilidad de prolongar el corredor hasta la Av. Los Incas o hasta el km. 22, en cuyo caso la distancia y tiempo economizado por parte de los usuarios, puede inducir a la captación del mercado del subsistema Norte, generando condiciones para una mejor organización del servicio, especialmente para las poblaciones de menores ingresos.</li> </ul>
<p>Durante la fase de ejecución de las obras de la Av. Túpac Amaru y Av. Caquetá, se restringirá la circulación en la Av. Tupac Amaru, que obligará eventualmente a un traspaso de flujos vehiculares a la Carretera Panamericana Norte-Zarumilla, cuya capacidad vial se encuentra saturada<sup>[2]</sup>.</p>	<ul style="list-style-type: none"> <li>● Se debería realizar una programación detallada de la ejecución de las obras.</li> </ul>
<p>El Área Central de Lima, es la zona más sensible para la implementación del PTUL, especialmente del COSAC I. Esta constituye el espacio de interacción más importante de la Metrópoli, en ella se concentra posiblemente más del 30% de los destinos o empalmes intermedios del sistema, lo cual la configura como una Zona de Tratamiento Especial, siendo el área de mayor sensibilidad socioambiental del PTUL.</p>	<ul style="list-style-type: none"> <li>● Es conveniente examinar la red del PTUL; especialmente, en estas áreas de mayor sensibilidad ambiental.</li> </ul>
<p>Estudios de tráfico realizado por el IMP, en 1997 muestran que los niveles de congestión son muy altos. Así en un solo sentido el flujo vehicular horario supera los 3,100 vehículos, casi 7,000 vehículos-hora en ida y vuelta. Estas cifras se han agudizado a la fecha, habiéndose constatado en campo que la velocidad actual de circulación en el ingreso entre Vía de Evitamiento a la Plaza Castilla y Plaza Dos de Mayo, llega apenas a 4 kms-hora, lo que se agudiza entre Zorritos y Av. Uruguay en cuyo tramo se ha detectado menos de 3 Km/hora.</p>	<ul style="list-style-type: none"> <li>● Complementariamente a la implementación del PTUL, se debería realizar el análisis de la capacidad del puente del Ejército hacia la Av. Alfonso Ugarte.</li> </ul>
<p>Durante la implementación del COSAC I, se producirá, temporalmente restricciones urbanísticas para el tránsito de vehículos por el Centro de Lima, considerando que dichas políticas cubren el ámbito que incluye Avs. Emancipación, Lampa y Alfonso Ugarte.</p>	<ul style="list-style-type: none"> <li>● Establecer un programa de señalización y turnos adecuados de trabajo</li> </ul>
<p>La alta concentración peatonal en el Centro Histórico, como en la Av. Emancipación y Av. Lampa, (en las horas de máxima demanda el número de usuarios superará los 20,000 usuarios).</p>	<ul style="list-style-type: none"> <li>● Se debería contemplar el desarrollo de una evaluación de la circulación peatonal en el Area Central; dado que ésta solamente dispone de 30,000 m2 de veredas y paseos peatonales.</li> </ul>

<sup>[1]</sup> Estudio de factibilidad de COSAC I

<sup>[2]</sup> Opinión Compartida entre el IMP y la DMTU.

<p>En el proyecto COSAC I considera la utilización de la Vía Expresa como el tramo principal de la ruta Centro de Lima-Chorrillos, que compromete mas de 9 de 29 Km. de todo el COSAC I. En este tramo, la troncal podría prestar un servicio de atención limitado, a causa de la accesibilidad restringida. Actualmente, este tramo es de baja demanda, concertándose la misma en las intersecciones con las Avenidas Javier Prado, Corpac; Angamos; Primavera y Benavides.</p>	<ul style="list-style-type: none"> <li>● Apoyar la concertación de un corredor segregado compartido entre las Avenidas Arequipa, Petit Thouars y Arenales, propuesto por las municipalidades distritales de Jesús María, Lince, Miraflores y San Isidro.</li> </ul>
<p>Evaluar los posibles problemas que podrían generarse a consecuencia de la ejecución de las obras en la Av. Tupac Amaru y la Av. Caquetá, en lo concerniente al traspaso de vehículos a la Panamericana Norte y en el manejo de los flujos vehiculares a la propia zona de influencia.</p>	<ul style="list-style-type: none"> <li>● Estudiar el conjunto de alternativas de paso del COSAC I por el Area Central, considerando las políticas del Órgano Municipal responsable del Centro Histórico de Lima, así como las capacidades de asimilación de paraderos por la saturación peatonal, la saturación vehicular y traspaso de flujos vehiculares provenientes del eje Plaza Castilla-Av. Alfonso Ugarte-Av. España-Plaza Grau.</li> </ul>
<p>La alta densidad de tráfico en la zona central constituye un problema de congestión y contaminación, causando desventajas de tiempo, consumo de combustible y una pésima percepción del ambiente urbano.</p>	<ul style="list-style-type: none"> <li>● Considerar, en la primera etapa del COSAC I la posibilidad de implementar un sub-sistema tipo URBANITO como transporte público en el Area Central, evitando el paso de Vehículos de Transporte Rápido Masivo de Pasajeros por el Area Central.</li> </ul>
<p>La arquitectura urbanística del centro de Lima debe conservar el mobiliario urbano de una zona donde los espacios de peatones son limitados.</p>	<ul style="list-style-type: none"> <li>● Estudiar la posible utilización de una alternativa subterránea Norte-Sur de paso por el Centro de Lima</li> </ul>

## RECOMENDACIONES ESTRATEGICAS POR AREAS TEMATICAS

AREA TEMATICA	RECOMENDACIONES ESTRATEGICAS	ACCIONES ESTRATEGICAS
<b><u>Ambientales</u></b>	<p>- Crear y fortalecer, con los recursos necesarios, la Unidad Ambiental del nuevo sistema de transporte urbano para ejecutar el Seguimiento del Programa de Gestión Ambiental.</p>	<ul style="list-style-type: none"> <li>● Implementación de la Unidad Ambiental, como una dependencia del ente gestor del Programa de Transporte Urbano de Lima Metropolitana – PTUL.</li> <li>● Establecimiento concertado de roles, entre las instituciones que tienen implicancia en el programa, para la implementación adecuada del mismo.</li> <li>● El personal responsable de la Unidad Ambiental, deberá ser informado plenamente sobre el PTUL, especialmente sobre el Programa de Gestión Ambiental.</li> <li>● Asesoramiento constante al personal encargado de dar seguimiento al Programa de Gestión Ambiental.</li> </ul>
	<p>- Fortalecer la capacitación y educación ambiental, a nivel de actores claves, escolares y estudiantes universitarios, con el fin de generar un efecto multiplicador, que ayuden a desarrollar campañas de divulgación en beneficio de la implantación exitosa del PTUL.</p>	<ul style="list-style-type: none"> <li>● La capacitación deberá estar orientada a la conservación del ambiente y a la aplicación de medidas técnicas para evitar su deterioro, así como al entendimiento de la importancia de la aplicación del Programa de Gestión Ambiental durante la operación del proyecto.</li> <li>● Publicación y difusión de volantes educativos para la población en general, fomentando la educación vial.</li> <li>● Desarrollar campañas de divulgación del proyecto, pueden ser mediante foros, seminarios o talleres desarrollados en colegios, universidades, municipalidades, entre otros, para informar a la ciudadanía las características de operación y uso del nuevo sistema.</li> <li>● Todas las actividades de capacitación y educación ambiental deberán ser documentadas y; además se evaluarán las capacitaciones recibidas.</li> </ul>
<b><u>Institucionales</u></b>	<p>- Fortalecimiento institucional de los organismos de la corporación municipal vinculados al transporte urbano, en la perspectiva de los principios considerados en la EAE y de una nueva cultura de transporte de la metrópoli.</p>	<ul style="list-style-type: none"> <li>● Esquematizar la autoridad funcional encargada de modo integral la gestión del Programa de Transporte Urbano de Lima Metropolitana – PTUL. Ésta autoridad deberá actuar en el ámbito de Lima Metropolitana.</li> <li>● Reestructuración de la asignación de competencias e integración de funciones vinculadas al PTUL.</li> <li>● Interacción con los organismos gubernamentales en materia de transportes y desarrollo urbano a partir de la MML.</li> <li>● Integrar un Programa de Transporte Rápido Masivo que cuente con su respectiva autoridad de orden corporativo, que se articule al PTUL conjuntamente con el Tren Eléctrico y a los usuarios y operadores. Esta autoridad se constituiría en una instancia de dirección corporativa.</li> </ul>
	<p>- Propiciar la resistematización, actualización y concordancia de la normativa referida al transporte urbano, con criterios de sostenibilidad económica, social y ambiental.</p>	<ul style="list-style-type: none"> <li>● Se deberá redefinir los derechos y obligaciones de los actores.</li> <li>● Regulación de sanciones positivas, estímulos, premios o ventajas que represente el acatamiento de mandatos así como la búsqueda de mejores soluciones (tributos, facilidades, reconocimientos, etc.).</li> <li>● Aplicación y efectividad de sanciones negativas (castigos)</li> <li>● Simplificación de procedimientos legales que garanticen un transporte funcional sostenible, tanto para todos los agentes, sin hacer prevalecer el principio abusivo de la autoridad por encima del ciudadano.</li> <li>● Elaboración de Plan de Adjudicación de Rutas</li> <li>● Actualización del plan estratégico del Transporte Urbano</li> <li>● Regulación de las áreas críticas del PTUL</li> <li>● Normas técnicas para concesiones de las troncales alimentadoras del PTUL</li> <li>● Norma que regulen circulación terrestre en corredores segregados</li> <li>● Establecer normas para vehículos de servicio público de transporte de pasajeros, no integrados al PTUL.</li> </ul>

<b>Económicos</b>	<ul style="list-style-type: none"> <li>- La Municipalidad Metropolitana de Lima, debe asumir un rol más activo en la promoción de la inversión privada y en el desarrollo de actividades económicas en la Metrópoli, aprovechando las nuevas oportunidades que genere la implementación del PTUL. Los programas propuestos en el Sistema de Gestión Socio-Ambiental del PTUL, son:</li> <li>- Subprograma de Promoción de la Inversión Privada en Actividades Económicas.</li> <li>- Subprograma de Promoción del Turismo.</li> <li>- Subprograma de Promoción de Empleo en Pequeñas y Microempresas.</li> </ul>	<ul style="list-style-type: none"> <li>● En primera instancia, la Municipalidad Metropolitana de Lima, deberá fomentar y difundir los objetivos del PTUL.</li> <li>● Conducir procesos participativos, a través de seminarios, publicaciones. Utilizando las fuentes de apoyo técnico existentes, como organizaciones con experiencia en procesos participativos, comunicación y publicidad.</li> <li>● Identificar a la población objetivo, grupos y organizaciones inversionistas.</li> <li>● Brindar servicios de asesoría e información sobre oportunidades de negocios a Pequeñas y Microempresas.</li> <li>● Programas de Capacitación a operadores de transportes en gestión empresarial.</li> <li>● Coordinación con el Ministerio de la Producción, y con gremios empresariales sobre políticas de promoción de actividades económicas en la metrópoli.</li> <li>● Concertación interinstitucional con participación ciudadana (Stakeholder).</li> <li>● Desarrollar y Promover Programas de Fomento Turístico.</li> <li>● Crear e institucionalizar mesa de concertación de la inversión privada, sobre políticas de promoción de actividades económicas.</li> </ul>
<i>Sociales</i>	<ol style="list-style-type: none"> <li>a. Institucionalizar los procesos de participación pública, tanto de usuarios como de operadores, a través de los gremios representativos, debidamente acreditados.</li> <li>b. Fortalecimiento institucional de la MML y de la autoridad del transporte, de modo que se garantice la coherencia en la gestión.</li> <li>c. Establecimiento de reglas claras para el largo plazo, de modo que brinden seguridad jurídica a las inversiones en el PTUL.</li> <li>d. Realización de un diagnóstico cuidadoso de los desplazados en el COSAC I, para el diseño del Programa de Compensación.</li> <li>e. Implementación de la escuela de conductores profesionales para el Servicio de Transporte Público.</li> <li>f. Ejecutar un Programa de Participación de la Sociedad Civil integrado por los siguientes Sub Programas: <ul style="list-style-type: none"> <li>- Subprograma de información masiva y participación de la sociedad civil.</li> <li>- Subprograma de consulta y participación pública con operadores y población afectada por reasentamiento involuntario.</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>● Iniciar el proceso de participación de la sociedad civil informando adecuada y oportunamente a los ciudadanos sobre los beneficios y costos del PTUL, para que estén en condiciones de ejercer influencia en el proceso de decisiones.</li> <li>● Promover la organización de los usuarios de los servicios de transporte público e incorporar su participación en la solución de los problemas de transporte metropolitano.</li> <li>● Conferencia de prensa para el lanzamiento del Programa del PTUL, con la debida publicidad.</li> <li>● Campaña publicitaria realizada desde el inicio y en forma sostenida, mediante medios de comunicación masiva, seleccionando prensa escrita, radial y televisada.</li> <li>● Divulgar información actualizada sobre el PTUL y otras alternativas propuestas (aquellas que estuvieran definidas), a través de la página web de PROTRANSPORTE.</li> <li>● Material informativo impreso, como folletos relevantes para el lector, que incluya mapas y texto en lenguaje sencillo.</li> <li>● Eventos y promociones, para el caso de operadores se debe establecer seminarios, que culminen en un campeonato (competencia).</li> </ul>
<i>Territoriales</i>	<p>Se recomienda participar en la elaboración del Plan Integral de Desarrollo Urbano Metropolitano Lima – Callao 2003 – 2015 y del Plan de Acondicionamiento Territorial de Lima Metropolitana 2003 – 2015.</p>	<ul style="list-style-type: none"> <li>● Para este efecto, es importante realizar las coordinaciones detalladas con las autoridades de las municipalidades distritales involucradas en las rutas definidas del PTUL, promoviendo la concertación interinstitucional.</li> <li>● Crear una comisión de alto nivel, conformada por la Municipalidad Metropolitana de Lima.</li> <li>● Diseñar proyectos especiales para asentamiento humanos que incluyan actividades productivas.</li> </ul>



## **Additional GEF Annex 12: Social Aspects PERU: LIMA TRANSPORT**

### **Fines y Objetivos sociales del proyecto**

El proyecto busca contribuir al desarrollo integral del area Metropolitana de Lima y Callao a travs de una red integrada de transporte que mejore la calidad de vida de su poblacion, especialmente la de menores recursos, en trminos socio-economicos, de movilidad, medio ambiente, seguridad vial y ciudadana, y mejore asimismo la competitividad de la ciudad, trasladando a su poblacion con economia y calidad.

#### **Fines**

- a) Incrementar la calidad de vida de la poblacion
- b) Incrementar la competitividad de la ciudad

#### **Objetivos generales del programa en el ambito social**

- a. Proveer un sistema sustentable de transporte pblico de calidad para la poblacion mas pobre de los conos del area metropolitana de Lima, que sea integrado, eficiente, masivo, seguro, rentable, menos contaminante y que garantice la accesibilidad de poblacion discriminada (equidad de genero, acceso a discapacitados).
- b. Mejorar las condiciones de acceso al transporte pblico, la seguridad ciudadana y reducir el numero de accidentes en las areas de influencia del corredor.
- c. Promover una nueva cultura de movilidad urbana en la ciudad de Lima que garantice la sostenibilidad economica y social del nuevo sistema de transporte, promover el uso de transporte pblico en usuarios del transporte privado.

#### **Indicadores basicos**

- Tiempo dedicado a la movilidad en transporte pblico de la poblacion en las areas de influencia disminuido (en horas/hab/d?a)
- Disminuyen los accidentes de transito en el area de influencia
- Disminuyen los ndices de criminalidad en los corredores disminuye (en su incidencia relativa sobre la criminalidad metropolitana)
- Se incrementa la valoracion economica del area de influencia
- El sistema de transporte pblico gana usuarios provenientes del transporte privado

#### **Estudios y acciones para mitigacion de los impactos sociales**

- Estudios de lnea de base social y diseo de un sistema participativo, de monitoreo y evaluacion de impactos del proyecto.

- Línea de base de operadores, y mitigación de pérdida de rutas y reconversión y reinserción laboral de los transportistas.
- Comercio ambulatorio y mejoramiento de la calidad de vida de los ciudadanos: se ha identificado la necesidad de dar un tratamiento al comercio ambulatorio que actualmente trabaja en el entorno de lo que será del área de influencia del proyecto. Esto es parte de las competencias municipales toda vez que, en cuanto al comercio informal, el rol edil (municipal), es promover su formalización. Adicionalmente, diversos estudios – propios pero también de fuentes secundarias – permiten ver la vulnerabilidad de esta población, así como por la sensibilidad sociopolítica que suscita el tema del mercado informal y la pobreza en la ciudad.
- Rediseño y reubicación y mejoramiento de mercado de flores: Si bien el proyecto tuvo como propósito evitar en la medida de lo posible la necesidad de reubicación de comercio o vivienda, en la práctica, basándose en los estudios técnicos, se ha identificado la necesidad de contar con un área actualmente ocupada por un comercio dedicado a la venta de flores. Se trata de un grupo de floristas asociados, que ocupan un lugar de propiedad y competencia de la Municipalidad Metropolitana de Lima, bajo un régimen de concesión temporal. Estos comerciantes serán compensados de acuerdo a la legislación nacional y municipal pertinente y en concordancia con los lineamientos de los organismos de cooperación. La solución propuesta se trata de la reestructuración del área actual, de manera que se mantengan los comerciantes, integrándose al paradero que será construido en parte del área actual. De acuerdo a las políticas definidas en el plan de reubicación, se reubicará temporalmente a los comerciantes mientras dure la ejecución de las obras de arquitectura del área.

### **Monitoreo de los impactos sociales**

En los temas sociales se ha previsto el diseño de un sistema de monitoreo y evaluación de impactos a usuarios, y la elaboración de una línea de base para dicho monitoreo y evaluación. En líneas generales, el propósito, alcances, objetivos y metodología propuestas para dicho sistema, son los siguientes<sup>1</sup>:

#### **Propósito y alcances del estudio**

El sistema de monitoreo y evaluación de impactos sociales debe permitir dar seguimiento a la evolución de los indicadores sociales identificados en la línea de base social del proyecto, a partir de la implementación del proyecto COSAC, que se convierta además en un mecanismo de participación y retroalimentación entre los usuarios y los beneficiarios del sistema, y el proyecto. Para este fin se entiende que los usuarios son aquellos que utilizarán el sistema de corredores segregados de alta capacidad (COSAC), mientras que los beneficiarios incluyen a los ciudadanos de la metrópoli en general, en la medida que sus condiciones de viaje se verán modificadas por cambios en la congestión vehicular, en el tiempo de viaje, tasa de accidentes, seguridad ciudadana, contaminación, etc.

#### **Objetivo general del sistema de monitoreo y evaluación de impactos sociales:**

Dar seguimiento al logro de metas y objetivos sociales del proyecto de Corredores Segregados de Alta Capacidad (COSAC), a partir de una línea de base desarrollada especialmente.

#### **Objetivos específicos**

1. Definir la metodología de monitoreo y de evaluación, incluyendo: objetivos, actividades, indicadores, técnicas de recojo de información e instrumentos, frecuencia, entre otros.

2. Diseñar y constituir el sistema a partir de mecanismos participativos con los usuarios y beneficiarios del proyecto, diseñando procesos de comunicación tales que permitan ofrecer y recoger la información relevante para el sistema de evaluación (basándose por ejemplo, en talleres periódicos en organizaciones de base, entrevistas y actividades similares).
3. Recoger la información de línea de base a partir de la cual se hará el monitoreo y evaluación de efectos e impactos sociales a partir de la implementación del proyecto.

### **Ámbitos del impacto esperado**

El impacto social espera cambios en:

- a. La movilidad urbana, entendida como los flujos de desplazamientos de las personas, por medios motorizados o no, en que se espera lograr impacto en torno a: zonas de generación de viaje, tiempo de desplazamiento, modificación en el uso de los medios del transporte público, número de conexiones tomadas para llegar al punto de destino, frecuencias de uso del transporte público, períodos de espera, tipo de transporte usado por los miembros del hogar por desagregados género y edad, etcétera.
- b. La calidad del servicio: mayor comodidad, seguridad, trato, higiene y regularidad en el servicio.
- c. El costo del servicio, cuyo impacto en los usuarios dependerá de las características con la que se fije y su relación con los ingresos familiares. La propuesta de partida del PTUL es mejorar la calidad del transporte de la gente a un costo accesible.
- d. La cultura de uso del espacio público y de los bienes públicos respecto al cuidado de las unidades de transporte, respeto de las normas y uso de los paraderos, cuidado de paraderos y terminales, hábitos de higiene en la vía pública, entre otros.
- e. La participación de los usuarios mediante mecanismos de control y fiscalización, modo de canalizar presiones y demandas frente al sistema del PTUL, apreciación de alternativas como las ciclovías, el “Plan Bici”, etcétera.
- f. Las condiciones de vida en general, vinculado a los efectos indirectos del PTUL sobre la pobreza urbana, incluidos aspectos como el incremento y/o mejora de activos productivos (tierra, casa y acceso a servicios), revalorización de los predios adyacentes a las troncales, aumento de número de miembros productivos, modificaciones en la composición del gasto de casa, tipo de tenencia de la vivienda, frecuencia de enfermedades de los miembros del hogar, nivel de la educación de los miembros del hogar, número de los niños que asisten a la escuela desagregado por el género y número de abandonos de la escuela, disminución de la delincuencia, entre otros.

## **LINEAMIENTOS DEL PLAN DE MITIGACION PARA OPERADORES DE TRANSPORTE PUBLICO IMPACTADOS POR EL COSAC1**

### **1. RESUMEN EJECUTIVO**

#### **1.1. Introducción**

La implementación del proyecto de corredor vial para desarrollar el sistema integrado de transporte público en la ciudad de Lima generará sin duda un conjunto de beneficios y cambios absolutos en la calidad de vida

de los usuarios del transporte público, así como una mayor y mejor competitividad de la ciudad de Lima como metrópoli en todas las variables reconocidas. Sin embargo, para lograr esos beneficios, es inevitable que en el corto plazo, se presenten impactos negativos en el ámbito socio económico de los operadores afectados por el proyecto COSAC, específicamente la reducción de ingresos, pérdida del negocio y pérdida del empleo. Precisamente el plan de mitigación tiene como propósito la reducción de los impactos negativos que serán generados por la implementación del proyecto.

### 1.2. Total de operadores formales impactados

Tal como se puede observar en el siguiente cuadro el total de vehículos afectados por el proyecto es de 5.258 y el total de personas desplazadas alcanza un número de 16.404 personas incluyendo propietarios, conductores y cobradores, de acuerdo al factor de asignación 3.12 persona/vehículo establecido por la DMTU.

**Cuadro N° 1**  
**Total de operadores formales impactados<sup>2</sup> por el COSAC**

Alcance de los Impactos	Número de vehículos afectados				Número de personas desplazadas
	Omnibus	Microbus	Camioneta Rural	Total	
<b>Afectados totalmente</b>	618	434	741	1.793	5.594
<b>Afectados parcialmente.</b>	276	1589	1600	3.465	10.810
<b>Global</b>	894	2023	2341	5.258	16.404

**Fuente: Protransporte**  
**Elaboración: propia**

Del total de vehículos afectados, 1.793 vehículos resultan totalmente afectados, lo que representa un total de 5.594 personas desplazadas del corredor vial. En ese sentido se considera en forma razonable que este grupo de operadores se encuentran más expuestos a los diferentes efectos negativos originados por su exclusión gradual del uso del corredor vial, primero por la construcción y luego por la operación del nuevo sistema de transporte de buses en dicho corredor.

Respecto a los 3.465 vehículos considerados parcialmente afectados y que representan cerca de 10.810 se entiende que la mayoría de ellos podrá (al menos en forma temporal y en tanto se produce la racionalización de rutas a cargo de la DMTU) seguir operando reorientando sus rutas o buscando otras alternativas en Lima o provincias.

Un comentario final que puede ser importante es que el número de impactados formales puede reducirse si los estudios de ingeniería determinan el mantenimiento de ciertas rutas concurrentes con el corredor vial, específicamente en la Zona Norte.

### 1.3. Meta de atención prevista por Protransporte

De acuerdo a los criterios definidos por Protransporte la meta inicial del plan de mitigación será focalizada para atender a 5.594 personas desplazadas por el COSAC tal como se presenta en el siguiente cuadro.

**Cuadro N° 2: N°mero de veh?culos y operadores formales totalmente impactados**

Número de vehículos afectados				Número de personas desplazadas
Omnibus	Microbus	Camioneta Rural	Total	
618	434	741	1.793	5.594

Fuente: Protransporte  
Elaboración: propia

Los grupos laborales que representan las 5.594 personas desplazadas se presentan a continuaci3n.

**Cuadro N° 3: N°mero de impactados por grupos laborales**

Grupos de operadores	Factor de Asignaci3n por Veh?culo	Número de personas	Distribuci3n Porcentual
Propietarios	0.81	1.454	26 %
Conductores	1.09	1.958	35 %
Cobradores	1.22	2.182	39 %
<b>Total</b>	<b>3.12</b>	<b>5.594</b>	<b>100 %</b>

Fuente: Protransporte  
Elaboraci3n: propia

#### 1.4. Propuesta de atenci3n anual

En el siguiente cuadro se presenta la propuesta para atender la meta inicial de 5.594 personas desplazadas incluyendo propietarios, conductores y cobradores durante el periodo 2004 -2006 horizonte temporal para la aplicaci3n del plan de mitgaci3n de impactos.

**Cuadro N° 4**  
**Propuesta de atenci3n anual**

Año	% estimado de operadores desplazados	N° Veh?culos Impactados	N° Personas Afectadas	N° de personas atendidas por a?o
2004	30 %	448	1.398	600
2005	40 %	897	2.798	2.400
2006	30 %	448	1.398	2.594
<b>Total</b>	<b>100 %</b>	<b>1.793</b>	<b>5.594</b>	<b>5.594</b>

Elaboraci3n propia

Se aprecia que en el a?o 2004, el porcentaje de operadores afectados por el proyecto no sera mayor del 30 % del n?mero total, esto considerando que en este a?o se iniciaran las obras del paso a desnivel de la Plaza Grau (desplazamiento focalizado) y se iniciaran las obras de la v?a expresa. En este a?o el plan de mitgaci3n preve?atender un maximo de 600 personas, en calidad de plan piloto de mitgaci3n.

En el a?o 2005 se estima un porcentaje de impactados del 40 %, considerando que las obras de la v?a expresa ya estar?an finalizadas en el mes de Julio, y que ese mismo a?o en el mes de Diciembre se culminar?an las obras de Barranco y Chorrillos. Asimismo, se iniciar?an las obras de la zona centro hacia el norte. Para este a?o se estima atender a 2.400 personas, considerando el contingente de rezagados del

año anterior y los nuevos desplazados.

Finalmente en el año 2006, se estima un 30 % de nuevos desplazados provenientes del contingente impactado en el año anterior y los últimos grupos de desplazados. Se propone atender a 2.594 desplazados y completar la meta al 100 % a fines del año 2006, cuando el negocio del operador ya está en la fase de puesta en marcha u operación según los casos.

#### 1.5. Impactos negativos en el proceso de implementación del corredor vial

Para analizar el desarrollo de los efectos negativos en los operadores se ha preparado un cuadro sobre los alcances de estos impactos en el proceso de implementación del corredor vial.

**Cuadro N° 5**  
**Impactos negativos y proceso de implementación del COSAC1**

Proceso de Implementación	Año 2004-2005	Año 2005-2006	2006- 2007
Fases	Construcción Zona Centro y Sur (Grau-Vía Expresa-Chorrillos-Barranco)	Construcción Zona Centro y Norte (Lima –Independencia-Comas)	Operación Sistema de Transporte en Buses
Impactos en el transporte	<input type="checkbox"/> Desplazamiento progresivo de los operadores.	<input type="checkbox"/> Desplazamiento progresivo de los operadores. <input type="checkbox"/> Excepto algunas rutas de la zona norte.	<input type="checkbox"/> Desplazamiento total y permanente de los actuales operadores.
% de impactados en cada fase	Estimado: 50 %	Estimado: 50 %	
<b>Operadores</b>	<b>Impacto Social Sur-centro</b>	<b>Impacto Social Centro-norte</b>	<b>Impacto social Todo el corredor</b>
Propietarios	2004: Reducción de la rentabilidad del negocio. 2005: Probable pérdida del negocio	2005: Reducción de la rentabilidad del negocio. 2006: Probable pérdida del negocio	Impacto general
Conductores	2004: Reducción de los ingresos. 2005: Probable pérdida del empleo.	2004: Reducción de los ingresos. 2005: Probable pérdida del empleo.	Impacto general
Cobradores	2004: Reducción de los ingresos. 2005: Probable pérdida del empleo.	2005: Probable pérdida del empleo. 2005: Probable pérdida del empleo.	Impacto general

#### 1.6. Propósito y estrategia general de la mitigación

El propósito de la mitigación es "reducir" los impactos negativos que afectarán a los actuales operadores formales como consecuencia de la implementación del corredor vial y del nuevo sistema de transporte público. Específicamente se busca compensar en la medida de lo posible la pérdida del negocio para los propietarios y la pérdida del empleo e ingresos para los conductores y cobradores.

La estrategia general prevista para atender la mitigación de los impactos negativos con los actuales operadores se basa en dos estrategias conjuntas:

- i. El fortalecimiento de la *capacidad laboral* para mejorar su acceso al mercado de trabajo mediante un proceso previo de "reconversión laboral", cuya finalidad es lograr un empleo asalariado o

directo.

- ii. El fortalecimiento de la *capacidad emprendedora* para fomentar la creaci3n de negocios o consolidar los existentes, cuya finalidad es lograr su autoempleo a trav3s de microempresas.

Los alcances o limitaciones de la mitigaci3n estan definidos por cuatro parametros que deben ser absolutamente claros desde el principio.

En primer lugar, la mitigaci3n no elimina todos los impactos negativos lo cual ser3a deseable, pero imposible de garantizar, aunque debe precisarse que en una proporci3n importante se buscara revertir los efectos en el empleo e ingresos de los operadores desplazados. En general siempre los grupos de mayor vulnerabilidad (menor capacidad econ3mica, menor formaci3n laboral o t3cnica y mayor edad) se encuentran expuestos a mayores riesgos de no lograr su reinserci3n laboral (empleo directo) o limitados por sus carencias de aptitud empresarial (emprendimientos econ3micos).

En segundo lugar, el plan de mitigaci3n s3lo podra atender al 35 % de los operadores formales impactados por el COSAC, pero focalizando al 100 % de aquellos considerados como totalmente desplazados y que por obvias razones tendran mayores da3os directos y colaterales. Esta poblaci3n meta es de 5.594 operadores formales desplazados y correlacionado a los recursos presupuestales previstos para facilitar viabilidad social del proyecto COSAC. Sin embargo, debe observarse que esta poblaci3n meta puede ser menor en funci3n de tres posibilidades:

- i. Que no se cumpla con los requisitos de elegibilidad para participar en el plan de mitigaci3n.
- ii. Que no todos los operadores afectados tengan inter3s o necesiten de acciones de mitigaci3n.
- iii. Que exista un nivel alto de deserci3n de los participantes.

En tercer lugar el plan de mitigaci3n no tiene como poblaci3n objetivo a los operadores desplazados parcialmente (10.810 personas) salvo dos casos de excepci3n:

- Aquellos grupos de operadores en los cuales el COSAC y la eliminaci3n de sus rutas naturales por la racionalizaci3n que lleve a cabo la DMTU produzcan el mismo efecto de “desplazamiento total” . Estos podran ser atendidos con los ahorros provenientes del cofinanciamiento del programa GEF-FONAM para aquellos grupos de operadores totalmente desplazados que participan en el plan de desguase.
- Aquellos grupos de operadores cuyos veh3culos hayan sido objeto de desguase incluidos en el plan de desguase del proyecto GEF-FONAM. Estos seran atendidos con los recursos del plan de mitigaci3n de este proyecto.

En cuarto lugar, en el ambito de 3ste plan de mitigaci3n no se considera posible ni deseable atender bajo ninguna forma a los operadores informales que resulten impactados. Al respecto mas adelante se proponen algunas medidas respecto al tratamiento de este sector bajo una estrategia integral de formalizaci3n y reconversi3n empresarial a cargo de la DMTU.

#### 1. 7. Criterios de base para la estrategia de mitigaci3n

Los criterios de base de la estrategia, a partir de las lecciones aprendidas en otras experiencias y los

propsitos del proyecto COSAC son los siguientes:

- **Transparencia.** La estrategia se sustenta en facilitar la información y orientación oportuna a los grupos de operadores desplazados desde el inicio de la fase constructiva del corredor vial, de tal manera que la propuesta del plan de mitigación pueda ser conocida y promovida entre la población objetivo con el suficiente tiempo.

Las diversas acciones del plan de mitigación debe ser presentadas en forma clara y directa, considerando objetivos realistas, una información, oportuna, seria y responsable para no generar falsas expectativas entre los participantes del plan. La presentación objetiva de las posibilidades y limitaciones del plan debe mantenerse durante todo el proceso.

- **Oportunidad.** Las estrategias de mitigación diseñadas deben ser aplicadas antes de que los operadores pierdan el negocio o el empleo. Esto significa un trabajo previo de capacitación de por lo menos seis meses antes según los grupos de atención que se vayan adscribiendo al plan de mitigación. Se deberá tener en cuenta la flexibilidad de la capacitación a los horarios y disponibilidad de tiempos de los operadores que durante la fase constructiva “continuarán” operando en rutas alternas.
- **Flexibilidad.** Las alternativas previstas para lograr los objetivos de la mitigación debe ser altamente flexibles respecto a las metas de atención, mecanismos de promoción, tiempos de intervención, componentes, y procedimientos aplicables de tal manera que el plan pueda responder en forma apropiada a la “demanda real” de los participantes, se adapte al proceso de implementación del COSAC en su fase inicial, intermedia y final con los distintos grupos y escenarios posibles.
- **Concertación.** El primer ámbito de la concertación está referido a la capacidad del mantener una coordinación permanente, fluida y productiva con las organizaciones de transportistas con el propósito de que conozcan, entiendan y apoyen el proyecto COSAC como parte de los objetivos de mejoramiento del transporte de la ciudad de Lima, y de esa manera desarrollar mecanismos que faciliten el proceso de reconversión laboral, así como las estrategias de ordenamiento y formalización para recuperar la rentabilidad y viabilidad del negocio de transporte. Si bien se reconoce que siempre es más difícil promover la concertación, ésta será indispensable para mantener la relación de apertura y diálogo con el sector, y evitar el conflicto abierto que puede perjudicar el éxito del proyecto.

El segundo ámbito de la concertación está referido a la implementación de un conjunto de alianzas estratégicas con entidades que puedan brindar soporte institucional y de servicios en la ejecución del plan de mitigación. De esta manera se utilizará la capacidad instalada existente, maximizando la experiencia y conocimiento adquirido por estas instituciones en programas y proyectos similares, y optimizando los recursos económicos presupuestados, siempre limitados, lo que permitirá atender a un número cercano a la población objetivo del plan.

- **Responsabilidad social.** La entendemos como la capacidad que pueda generarse entre los eventuales postores a los diferentes negocios vinculados al COSAC, para asumir el compromiso legal de colaborar en las acciones de mitigación, específicamente a través de ofertas de absorción laboral o tercerización de servicios. Este proceso puede ser promovido mediante diferentes incentivos en los procesos de licitación de las concesiones. Sin embargo, nos parece fundamental entender que cualquier mecanismo “inclusivo” de los actuales operadores debe responder a las



exigencias y estándares de calidad y competitividad para los puestos laborales y servicios que forman parte de la demanda interna de los proyectos vinculados al COSAC, en ese esquema la calidad de la calificación laboral es la clave para garantizar el éxito de este mecanismo.

## 1. 8. Alternativas de mitigación para los operadores desplazados

### 1. 8.1 *Alternativas fuera del sector transporte*

En general las oportunidades fuera del sector transporte son bastante limitadas, en especial en las alternativas de empleo directo, esto significa reforzar las acciones de intermediación y conexión laboral, que actualmente se realizan a través de las Bolsas de Empleo con entidades como el Ministerio de Trabajo y SENATI. En ese sentido hay que desarrollar una actitud proactiva y estudiar una mayor segmentación de la demanda laboral para preparar las ofertas de perfiles laborales que puedan acceder a estas demandas.

En el caso de la promoción de microempresas, se presentan oportunidades diferenciadas:

- La primera alternativa de mitigación, es fortalecer los negocios familiares existentes, generalmente mediante soportes de asistencia técnica y crédito. La ventaja de esta alternativa es que ya existe un capital de inversión existente y lo que se busca es mejorar su gestión y sus ingresos para lograr que la familia soporte de mejor manera la pérdida del empleo del operador, el cual dependiendo del tipo de negocio podrá participar en éste o buscar otras alternativas de empleo laboral o autoempleo.
- La segunda alternativa, es la promoción de microempresas asociativas con el propósito de desarrollar nuevos emprendimientos con el soporte de capacitación y crédito. La ventaja en este caso es la posibilidad de conformar grupos asociados de 2 o 3 desplazados que tengan interés, compromiso y aptitud suficiente para estos emprendimientos, en este caso si bien hay un mejor impacto en cuanto al número de mitigados, también hay un proceso más lento de formación empresarial. El otro asunto, es la necesidad de vincular la formación de estas microempresas con la demanda potencial de servicios de los municipios (por ejemplo: mantenimiento de ciclovías, parchado de pistas y reparación de veredas, mantenimiento de áreas verdes, reparación de bicicletas, mensajería en bicicletas, etc.) principalmente de aquellos ubicados en las zonas de influencia del COSAC y del proyecto GEF-FONAM, así como explorar las nuevas demandas de servicios para los próximos años (por ejemplo, demandas de servicios por cambios de tecnología a gas).
- La tercera alternativa, es la promoción de microempresas individuales, la cual está pensada exclusivamente para los operadores propietarios que deseen emprender nuevos negocios o fortalecer los existentes, en este caso el mayor soporte es la capacitación y asistencia técnica, en el caso del crédito este se limita a un menor cofinanciamiento considerando que el propietario debe contar con un capital de inversión para este negocio.

En el caso del crédito, el programa establecerá un mecanismo de Fondo de Garantía que será desarrollado con una o más entidades financieras que son las que otorgarán los créditos de acuerdo a sus criterios de evaluación y condiciones. Por otra parte, el fondo de garantía sólo cubrirá un máximo de US\$ 1.500 dólares por microempresa en cualquiera de las tres modalidades de emprendimientos y siempre mediante un cofinanciamiento mínimo de los propios operadores desplazados.

Debe tomarse en cuenta que al menos durante los dos primeros años del plan: 2004 y 2005 la mayor parte de las estrategias se concentrarán en las alternativas fuera del sector. En el siguiente cuadro se presenta un

resumen de estas en función de los grupos de desplazados.

**Cuadro N° 6**  
**Alternativas de mitigación fuera del sector transporte**

Grupos Laborales	Impactos negativos	Reconversión Laboral	Promoción de microempresas		
		Empleo directo	N.F	MEA	MEI
Propietarios	Pérdida del negocio.	No	Sí	No	Si
Conductores	Pérdida del empleo.	Sí	Sí	Sí	No
Cobradores	Pérdida del empleo	Sí	Sí	sí	No

NF = Negocios Familiares existentes  
 MEA= Microempresas Asociativas  
 MEI = Microempresas Individuales

- En el caso de los propietarios las alternativas más viables y con mejor probabilidad de éxito se encuentran en los emprendimientos o negocios, especialmente la promoción de microempresas individuales y en menor medida los negocios familiares. Esto responde a su menor vulnerabilidad frente a los impactos negativos y a la búsqueda de “sustitución” del negocio que se identifica como tendencia general.
- Por su parte para los conductores las alternativas más viables y con mejor probabilidad de éxito también se encuentran en los emprendimientos o negocios. Se observa que en el caso de los conductores las posibilidades de empleo directo son bastante limitadas, para lo cual debe acceder a un proceso de capacitación laboral que resulta más difícil en grupos mayores de 30 años.
- Finalmente, para los cobradores las alternativas más viables se encuentran en los negocios familiares y en las microempresas asociativas. Se observa que los cobradores en su gran mayoría menores de 30 años se encuentran más dispuestos a ser capacitados en tanto que son concientes que sin una mayor formación laboral sus posibilidades de acceso son muy limitadas.

### 1.8.2 Alternativas dentro del sector transporte

En cuanto a las oportunidades identificadas dentro del sector transporte, a partir de los diferentes negocios en el ámbito del nuevo sistema de transporte público, se puede afirmar que se presentan posibilidades efectivas de empleabilidad y reinserción de los desplazados a través de los diferentes alternativas y más dulos de mitigación propuestos.

El estudio elaborado FONAM<sup>3</sup> Estudio de mitigación de impactos elaborado por el consultor Fernando Perera. Enero. 2003. estima que estos proyectos y negocios pueden generar aproximadamente 2.760 puestos laborales, entre empleo directo y servicios complementarios requeridos y que podemos considerar como una potencial demanda interna del proyecto. No obstante, para un diseño técnico de la demanda laboral se requerirá<sup>4</sup> Específicamente es necesario determinar la demanda laboral y de servicios en los negocios de transporte de pasajeros en las rutas principales y alimentadoras; en los negocios de mantenimiento de las unidades y de la infraestructura del COSAC, y en los negocios colaterales.

la culminación de los estudios técnicos y económicos sobre los diferentes negocios vinculados al COSAC y que se encuentran en proceso de preparación de los términos de referencia.

En ese sentido estamos seguros de que las mejores oportunidades de mitigación se encuentran principalmente dentro del sector transporte, y principalmente en las demandas internas del propio proyecto COSAC. Sin embargo debe observarse, que precisamente estas mejores opciones serán posibles de implementar recién a finales del año 2005 y durante el año 2006 cuando se inicie el proceso de puesta en

marcha de los negocios principales y colaterales. En el siguiente cuadro se presenta un resumen de las alternativas de mitigación por cada grupo laboral afectado.

**Cuadro N° 7 : Alternativas de mitigación dentro del sector transporte**

Grupos Laborales	Impactos negativos	Reinserción Laboral	Reconversión Laboral	Microempresas de servicios
Propietarios	Pérdida del negocio.	No	No	Si
Conductores	Pérdida del empleo.	Si	Si	Si
Cobradores	Pérdida del empleo	No	Si	Si

- Los propietarios tienen mejores oportunidades en las alternativas de tercerización de servicios con mayor exigencia de capacitación e inversión económica, esto en tanto les permitiría desarrollar un negocio sostenible y rentable en sustitución del actual. Asimismo, podrán disponer de un capital propio en el caso se acredite su participación en el plan de chatarreo promovido por el proyecto GEF-Fonam.
- En el caso de los conductores se presentan varias alternativas viables, quizás la de mayor interés sea la referida a la posibilidad de inserción en el sistema de transporte urbano, continuando con la misma posición laboral aunque en mejores condiciones de servicio y calidad laboral.
- Finalmente, los cobradores tienen las mejores posibilidades en la promoción de servicios complementarios intensivos en mano de obra, y en menor grado en la alternativa de reconversión laboral.

## 1. 9. Breve descripción de los módulos de mitigación

### 1. 9.1 *Metas por módulos*

Se presenta a continuación las metas propuestas para el periodo 2004-2006.

**Cuadro N° 8: Meta por módulos de mitigación**

Módulos de Mitigación	Meta Global	Año 2004	Año 2005	Año 2006
Fuera del sector transporte	N° de personas			
Reconversión Laboral	2.400	400	1.000	1.000
Promoción de microempresas	1.000	200	500	300
Dentro del sector transporte	N° de personas			
Reinserción Laboral	400		200	200
Reconversión Laboral	1.200		600	600
Promoción de microempresas	600		300	300
<b>Total</b>	<b>5.600</b>	<b>600</b>	<b>2.600</b>	<b>2.400</b>

### 1. 9.2 *Módulos por ámbitos de intervención*

## I. **Fuera del sector transporte**

### 1.1 **Módulo de reconversión laboral.**

Mediante esta alternativa se propone un proceso de capacitación y formación laboral dirigido a cobradores y conductores desplazados, los cuales previa certificación serán considerados en la bolsa de empleo del

Ministerio de Trabajo para su conexión con el mercado laboral. Este módulo deberá reforzar además la investigación de segmentos de la demanda laboral insuficientemente atendidos y una mayor conectividad con los posibles demandantes. Este módulo será implementado con los programas de empleo para jóvenes y adultos del Ministerio de Trabajo

### **1.2 Módulo de promoción de microempresas**

Mediante esta alternativa se propone un proceso de capacitación técnica y en gestión empresarial, así como la asesoría y orientación necesaria para la formación de microempresas. El soporte financiero será desarrollado de manera selectiva y como un apoyo colateral al proyecto de emprendimiento, bajo cualquiera de las tres modalidades previstas: negocios familiares, microempresas asociativas y microempresas individuales. Este módulo será implementado con los programas de emprendimiento del Ministerio de Trabajo.

## **II. Dentro del sector transporte**

### **2.1. Módulo de reinserción laboral de conductores.**

Mediante esta alternativa se propone un proceso de capacitación técnica, con nivel A1, como un requisito a la profesionalización de choferes de transporte público de pasajeros. Los conductores calificados serán considerados en un bolsa especializada de conductores para su conexión laboral con los operadores de los negocios de transporte de la red troncal y red alimentadora del proyecto COSAC, así como a los operadores del transporte de pasajeros interprovincial y de carga.

### **2.2. Módulo de reconversión laboral de cobradores y conductores.**

Mediante esta alternativa se propone un proceso de capacitación técnica especializada en un conjunto de posiciones laborales vinculadas al sector transporte, en especial, pero no exclusivamente, en los empleos técnicos identificados en los negocios principales y colaterales de los operadores del proyecto COSAC. Los operadores calificados serán considerados en un bolsa especializada de empleo para su conexión laboral con los diversos operadores vinculados al transporte público o de carga.

### **2.3. Módulo de microempresas de servicios.**

Mediante esta alternativa se propone un proceso de capacitación técnica y laboral para brindar un conjunto de servicios técnicos, intensivos en mano de obra, vinculadas a los negocios de mantenimiento y negocios colaterales considerados en el proyecto COSAC, así como otros que pudieran identificarse en una orientación de cambios en el sector. Los operadores calificados conformarán microempresas de servicios especializados que serán subcontratados por las operadoras del negocio o por empresas intermediarias con vocación permanente.

### **1.10 Presupuesto total y ejecución anual**

El presupuesto total ha sido preparado en función de los módulos de mitigación propuestos, cada uno de los cuales tiene un presupuesto específico por componentes y se encuentran detallados en la sección correspondiente.

**Cuadro N° 9: Presupuesto total y ejecución anual**

<b>Módulos de Mitigación</b>	<b>Presupuesto Total (US\$)</b>	<b>Año 2004</b>	<b>Año 2005</b>	<b>Año 2006</b>
Alternativas fuera del sector transporte				
Módulo de Reconversión Laboral	380.000	96.000	142.000	142.000
Módulo de Promoción de Microempresas	706.000	137.000	303.000	266.000
Alternativas dentro del sector transporte				
Módulo de Reinserción Laboral	196.000	40.000	78.000	78.000
Módulo de Recoversión Laboral	287.000	30.000	128.500	128.500
Módulo de Promoción de microempresas	264.000	56.000	104.000	104.000
<b>Total</b>	<b>1.833.000</b>	<b>359.000</b>	<b>755.500</b>	<b>718.500</b>

<sup>1</sup>La fuente para la información que sigue es el documento de términos de referencia borrador, elaborados por PROTRANSPORTE.

<sup>2</sup>Para efectos del presente informe y para diferenciar el impacto del COSAC, se considera que los vehículos son “afectados” y las personas son “desplazadas”.

<sup>3</sup>Estudio de mitigación de impactos elaborado por el consultor Fernando Perera. Enero. 2003

<sup>4</sup>Específicamente es necesario determinar la demanda laboral y de servicios en los negocios de transporte de pasajeros en las rutas principales y alimentadoras; en los negocios de mantenimiento de las unidades y de la infraestructura del COSAC, y en los negocios colaterales

## **Additional GEF Annex 13: LINEAMIENTOS DE ACCION PERU: LIMA TRANSPORT**

### **LINEAMIENTOS DE ACCION PARA LA IMPLANTACION DE UNA RED MINIMA DE MONITOREO DE CALIDAD DE AIRE PARA ELCOSAC1/ PTUL**

#### **1. Antecedentes.**

El Programa de Transporte Urbano de Lima ha incorporado variables e indicadores ambientales para la evaluación y eficiencia en la implementación de los corredores segregados de alta capacidad. Dentro de este concepto se incluye la implantación de una Red Mínima de Monitoreo de la Calidad del Aire para el área de influencia del proyecto.

El diseño de una red de monitoreo de la calidad de aire para el área metropolitana forma parte de los alcances de Plan Integral de Saneamiento Atmosférico que viene gestionando el Comité de Gestión de la Iniciativa de Aire Limpio para Lima Callao, en el marco de la iniciativa de aire limpio impulsada por el Banco Mundial para América Latina.

En 1997 la Municipalidad Metropolitana de Lima realizó con la Empresa Powers Engineering Air Pollution Control un estudio de factibilidad para el desarrollo de la Red de Monitoreo del Aire para el Área Metropolitana Lima-Callao, red constituida por 12 estaciones (no todas completas) que alternaba equipos automáticos y pasivos, con un costo total de 700,000 dólares americanos.

En diciembre del 2000, el Comité de Gestión de Aire Limpio para Lima Callao, culmina un segundo estudio de red denominada Red de Vigilancia del Aire para Lima Callao, atendiendo a nuevos requerimientos técnicos para el manejo de episodios críticos (a diferencia de la anterior) en especial provenientes de emisiones vehiculares y factores adversos atmosféricos, para la puesta en rigor de la toma de decisiones rápidas sobre salud pública, confeccionándose una red de 15 estaciones de un costo total de algo mas de 2'500,000 dólares americanos.

#### **2. Parámetros de medición.**

De conformidad con estudios y diagnósticos realizados por las instituciones integrantes del citado Comité de gestión, y en función de los alcances del Reglamento de Estándares de Calidad Ambiental del Aire (Decreto Supremo 074-2001-PCM), los contaminantes a evaluar son Material Particulado PM 10 y PM 2.5, Dióxido de Azufre, Dióxido de Nitrógeno, Monóxido de Carbono, y Plomo.( no se evaluara ozono, dado solo se tiene evidencia de su hallazgo muy fuera del área de influencia del proyecto, ni hidrogeno sulfurado proveniente del sector industrial ribereño del Callao). La casi totalidad de contaminantes criterio a evaluar corresponden a componentes de las emisiones vehiculares del parque automotor local de conformidad con estimaciones realizadas por el Comité de gestión.

#### **3. Acuerdos Interinstitucionales.**

Teniendo en cuenta que la gestión y administración de la calidad del aire viene siendo objeto de múltiples actividades y correspondientes a distintas instituciones, las futuras acciones que contribuyan a su desarrollo con información fehaciente y con la implementación de medidas concretas de reducción de contaminantes como la implementación de corredores segregados con buses de alta capacidad, requiere el desarrollo de acuerdos transectoriales para garantizar su implementación; los cuales preferentemente deben de ser generados a partir de la opinión o coordinación con del Comité de Gestión de la Iniciativa de Aire Limpio para Lima Callao, ente de concertación y coordinación multi-sectorial. En tal sentido con fecha 15 de mayo se desarrolló una sesión del referido comité que da cuanta de su respaldo al proyecto y de su

adecuada inserción del proyecto a nivel interinstitucional, brindándose recomendaciones que son convenientes de incorporar, así mismo se advierte del compromiso por parte de DIGESA del Ministerio de Salud, respecto de incorporar en el presupuesto de su Sector los gastos que se incurran para el mantenimiento de la red, durante la fase posterior al operador que integre y opere temporalmente la red. El compromiso del comité adicionalmente a lo indicado será el de remitir oficialmente un acta con los acuerdos del comité al respecto.

#### **4. Acciones previstas.**

4.1 De conformidad con las sugerencias establecidas por los acuerdos del Comité multisectorial de gestión, se debe de conformar un grupo de trabajo coordinado por PROTRANSPORTE, para los efectos de definir los alcances técnicos generales sobre la localización de equipos de la red, especificaciones técnicas e identificación de opinión especializada sobre la materia.(ver alcances reseñados en ítem 4.3). Dicha comisión en coordinación con los bancos tendrá el rol de diseñar los términos de referencia del estudio, así como el establecimiento de un esquema de financiamiento del mantenimiento que involucre desde un inicio tanto a PROTRANSPORTE como a DIGESA, para que luego de 2 años o mas de conformidad con el arreglo interinstitucional, DIGESA asuma toda la operación con presupuesto de su Sector.

4.2 Solicitar a la Dirección General de Salud Ambiental del Ministerio de Salud, ente nacional encargado de la supervisión del monitoreo ambiental del aire, información correspondiente a la relación de equipos disponibles, estado de mantenimiento, equipos con desperfectos que requieran reparación, descripción de laboratorio y equipos de calibración, relación de equipos donados por el Cantón de Zurich en el año 2002 que se encuentren operativos, resultado consolidado de medición de concentración de contaminantes atmosféricos diagnosticados en los últimos años, así como de los recursos presupuestados para el presente año asignados a su presupuesto institucional para la adquisición de equipos de monitoreo de calidad de aire tanto con recursos propios como de fuente externa.

4.3 Convocar a concurso publico para contratar los servicios de una empresa que preste el servicio altamente especializado de diseño e integración de redes de monitoreo de la calidad del aire. para la contratación de una consultora encargada de diseñar la Red Mínima de Monitoreo, cuyos alcances serán los siguientes:

- Revisión detallada de los equipos que cuenta DIGESA, estado de conservación.
- Definición de una red integrada con los equipos nuevos a adquirir con los de propiedad de DIGESA, a fin de repara los equipos descompuestos en términos razonables e integrándolos en una sola red con las nuevas estaciones.
- Determinación de la localización y características de las estaciones nuevas ha proponer y actuales en operación teniendo en cuenta la programación de obras del COSAC, y las necesidades del Comité de Gestión de Aire Limpio para Lima Callao.
- Determinación de las especificaciones técnicas de los equipos para cada estación
- Evaluación de alternativas en el empleo de estaciones móviles y fijas.
- Descripción de los componentes electrónicos de integración de equipos y diseño de red de

información en tiempo real.

- Diseño y características de laboratorio de calibración (el trabajo incluye la evaluación del laboratorio que cuenta DIGESA)
- Evaluación de las diversas formas de mantenimiento y costos respectivos.
- Diseño de plan de muestreo o monitoreo.
- Concepción del monitoreo del COSAC y su visión metropolitana en la gestión del aire y el transporte.
- Definición de formas de operación (capacitación y tercerización del servicio).
- Interpretación de resultados.
- Diseño de bases de licitación internacional de la red y su operación.
- Estimación general de costos directos, indirectos, de mantenimiento, de movilidad y de personal.

4.4 Igualmente de conformidad con las sugerencias establecidas por el Comité de Gestión, las acciones de monitoreo deberán de implementarse antes del inicio de las obras con la finalidad de iniciar el monitoreo del aire para consolidar una buena línea de base ambiental, y luego monitorear las consecuencias ambientales que generen las obras (efectos negativos observables por el desvío de rutas e incremento de tráfico vehicular temporal en áreas residenciales) y finalmente realizar el monitoreo durante la operación de las distintas etapas del proyecto.

4.5 Definido el proceso de concepción, diseño, licitación y operación de la red, establecer convenio con DIGESA para establecer los mecanismos de mantenimiento de la red y administración de la información.

4.6 Para los efectos de consolidar y validar procesos de administración de calidad de aire y su relación con las emisiones vehiculares, es conveniente, formalizar un convenio de cooperación recíproca entre PROTRANSPORTE, EL Comité de Gestión y una entidad de cooperación o asistencia técnica, para establecer mecanismos de cooperación técnica con centros de investigación y de respaldo regional con organismos como el Centro Panamericano de Ciencias del Ambiente CEPIS, oficina panamericana dependiente de la Organización Mundial de la salud. Organismo que posee vasta experiencia y facilidades de contacto técnico en la región para los efectos de lograr fortalecer la gestión de la administración de la calidad de aire del área metropolitana Lima Callao, en su dinámica relación con el transporte y el manejo o administración de la red. De la misma manera contribuir, brindando información que pueda ser de utilidad a alguna otra ciudad, tanto nacional como en América Latina

## **5. Cronograma recomendable**

De acuerdo con las consideraciones ambientales adecuadas para una óptima implementación de una red de monitoreo que acompañe este importante proyecto de transporte urbano público. La red de monitoreo propuesta debe de estar operativa, es decir generando información algunos meses antes del



inicio de obras. De esta manera se puede construir una correcta línea de base ambiental, y por consiguiente se podrá monitorear los efectos del tráfico en la atmósfera, antes de obras, durante la fase de construcción y luego en la fase de operación del proyecto.

En este sentido y de acuerdo a la programación de PROTRANSPORTE se establecen las siguientes fechas.

Junio 2003	Inicio de acciones administrativas para la licitación del estudio de Diseño de la Red
Septiembre 2003	Inicio de la consultoría del Diseño de la Red:
Noviembre 2003	Inicio de acciones administrativas para la licitación de implementación de la Red
Junio 2004	Inicio de construcción de la Red
Noviembre 2004.	Fecha tentativa de inicio de monitoreo

## 6. Responsables institucionales en la implementación de la red y consecuentes actividades.

	<b>Institución</b>	<b>Rol</b>
1	Dirección General de Salud Ambiental DIGESA Ministerio de Salud	Ente nacional regulador de la actividad de monitoreo ambiental. Encargado de supervisar la operación de los equipos de monitoreo a nivel nacional, su validación e interpretación oficial de resultados. Integrador de la información que viene generando los equipos de propiedad de DIGESA con la red mínima del proyecto COSAC/PTUL.
2	PROTRANSPORTE	En coordinación interinstitucional y con los bancos, llevar a cabo el proceso de licitación y elaboración de términos de referencia para el diseño de la red mínima y del plan de monitoreo; definir los plazos y alcances de la licitación, así como de la implementación de la red, de conformidad con las etapas del proyecto y objetivos ambientales que se planteen. Interpretar los resultados que brinde la red y dar consecuente atención, mediante acciones de recomendación en materia de remediación, mitigación o contingencia vinculados al sistema de corredores segregados de transporte y calidad de aire. Mediante convenio establecer mecanismos de coordinación con DIGESA, respecto de mantenimiento u operación de red e interpretación de data.
3	Comité de Gestión de la Iniciativa de Aire Limpio para Lima Callao	Establecer las recomendaciones del caso en el ámbito del área metropolitana respecto de la data que genere la red, proponer y coordinar las acciones correspondientes, definir las acciones que correspondan con el seguimiento de metas del Plan Integral de Saneamiento Atmosférico (PISA).
4	Dirección Municipal de Servicios a la Ciudad Municipalidad Metropolitana de Lima	Sobre la base de la información generada por la red, reorientar en caso necesario su plan de actividades de gestión ambiental
5	Dirección Municipal de Transporte Urbano. Municipalidad Metropolitana de Lima	Interpretar los resultados que brinde la red y dar consecuente atención, mediante acciones de recomendación en materia de remediación, mitigación o contingencia vinculados al sistema de transporte metropolitano y calidad de aire, y reorientar en caso necesario su plan de actividades de administración del transporte urbano y plan de rutas.
6	Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente	Brindar soporte técnico con referencia a la gestión de la calidad de aire y su relación con las emisiones vehiculares en experiencias latinoamericanas, soporte técnico especializado y replica de experiencias exitosas dentro del programa de actividades de aire limpio de las Naciones Unidas para la región.

## 7. Presupuesto

Teniendo en consideración, la asignación económica prevista para el componente ambiental del proyecto, el recurso disponible debe de consignar un número de 3 estaciones, siendo 3 estaciones, una red mínima y

económicamente razonable. Este tema también dependerá de la opinión del consultor que diseñe la red en la medida que pueden constituirse más estaciones integrando equipos de DIGESA o incluyendo menos equipos en algunas estaciones. Considerando que cada estación completa esta estructurada con albergue (shelter), equipos de monitoreo de gases (óxidos de nitrógeno y azufre y monóxido de carbono) y equipos de medición de material particulado, tubos de extracción de aire, centro de datos (dataloggers), equipo meteorológico, aire acondicionado interior, estabilizador de voltaje y sistema de comunicación de datos por red). El costo de una estación completa según estándares latinoamericanos oscila entre los 175,000 y 200,000 dólares americanos, y los gastos de mantenimiento que incluyen mantenimiento preventivo, y pago de personal puede significar en promedio un 10% de los costos de inversión como monto anual aproximado. En tal sentido se presenta la siguiente tabla 1 de costos, con información obtenida del estudio Red de Vigilancia de la Calidad de Aire, elaborado en el año 2000, estudio realizado para el Comité de Gestión e información actualizada respecto al rubro de mantenimiento teniendo en cuenta los gastos de mantenimiento de redes en Latinoamérica. La tabla siguiente muestra una estructura de costos teniendo en cuenta todos sus componentes y gastos correspondientes para tres (3) años de operación.

**TABLA 1**  
**ESTRUCTURA DE COSTOS DE RED MINIMA DE MONITOREO DEL AIRE DE**  
**COMPONENTES NUEVOS DE LA RED INTEGRADA LIMA-CALLAO**  
**ESTACIONES AUTOMÁTICAS COMPLETAS**  
**3 ESTACIONES NUEVAS**

DESCRIPCION	COSTO EN US DOLARES	% DEL COSTO TOTAL
Diseño de Red Mínima y Plan de Monitoreo	40,000	4.24%
Central de Computo	69,930	7.41%
Caseta de albergue de equipos (3 estaciones)	65,000	6.89%
Equipos de Monitoreo	494,100	52.37%
Mantenimiento de equipos,(consumibles) y gastos de personal técnico que opera la red (3 años)	245,700	26%
Vehículo pick up	25,000	2.65%
Mantenimiento vehículo pick up (1 año)	400	0.04%
<b>COSTO TOTAL(incluye gasto operación de un 3 años y gastos de importación</b>	<b>940,130</b>	<b>100%</b>

Costos en US\$ tomados de estudio: Red de Vigilancia de la calidad de Aire (año 2000), Swisscontact, Comité de Gestión de Gestión de Aire Limpio para Lima Callao y de PROTRANSPORTE.

## **Additional GEF Annex 14: Municipio Metropolitano de Lima (MML) and Indebtedness Capacity PERU: LIMA TRANSPORT**

### **Introduction**

This annex presents an analysis of the fiscal and financial situation of Metropolitan Municipality of Lima (MML), with the purpose of assessing its debt service capacity related to a possible loan operation with the Bank, co-financed by IDB, for the year 2003 and with disbursements starting in 2004. The assessment of the debt service capacity will also confirm that MML is in compliance with Law No. 27958, which modified the Peruvian law of Fiscal Prudence and Transparency.

To ensure the financial sustainability related to a possible long-term indebtedness, an Income-Expenditure projection model has been developed. The model not only permits simulation of the financial performance of MML related to the implementation of the Lima Transport project, but also suggests measures aimed at maintaining the municipality's financial situation within a sustainable context.

The assessment of the financial performance started out with a socio-economic characterization of MML, followed by an analysis of the fiscal and financial situation, and a diagnosis of its past performance. On the basis of the former, MML has proposed and developed a fiscal and financial action program that will help maintain a sound financial situation, as described below. Also, an analysis of the impact of the proposed loan operation has been conducted in order to provide with sufficient instruments for the national government to endorse loan guarantee required by Law No. 27958. It has been agreed with the MML and the Bank that the MML will present a fiscal and financial action program on the yearly basis so that the government can monitor and control the financial situation of the municipality and prevent financial deficits. Finally, a financial mechanism has been designed to payback the loans to the Banks through a creation of a Trust Fund, which must be established at the time of signature of the loan agreement. These analyses are described below.

### **2. City finances during 1998-2003**

Law 27958, which modifies the Fiscal Prudence and Transparency Law, prescribes a number of criteria to be complied by the regional and local governments within these parameters, before they can obtain a loan guarantee from the Peruvian government and thus obtain loans from multilateral banks. To this effect, MML's historical income and expenditure for the 1998 – 2003 period were analyzed to verify MML's compliance of the existence of a primary result (surplus) during the 2001 – 2003 period.

It should be mentioned that projections were drawn for the year 2003, based on the budget execution of the first months of the year, and for the rest of the year a projection was drawn with the addition of the actions and measures that MML is applying to improve its fiscal and financial situation.

As shown in Table 1, the financial situation of MML shows an accelerated tendency towards improvement in the last part of the period under analysis. The year 2001, a year in which the deficit was close to 17% (US\$ 16.8 million) of Total Income, the situation of MML showed a trend toward deterioration, and although 2002 also registered a deficit (US\$ 2.3 million), the negative result was significantly lower than the previous year, and marked a point of inflection in the tendency. In this way, together with the new expenditure-reduction measures and the increase in income of MML, projections of results for the current year show an important surplus, approximately US\$ 22 million.

The problem of the first years is explained in a relatively easy manner: although income increased, expenditures grew in excess. The explanation of the improvement of the latter years is also easy: expenditure reduction and increase in income.

**Table 1. Historical Income and Expenditures, 1998-2003**  
(US\$ million)

Budget Execution	1998	1999	2000	2001	2002	2003
<b>I. Current Income</b>	93.4	95.2	94.6	99.8	110.7	121.9
1. Taxes	18.7	18.1	19.9	16.4	21.0	24.2
2. Other Taxes	40.4	42.7	39.0	42.0	48.2	55.7
<b>II. Capital Income</b>	0.0	0.0	0.1	0.5	0.1	0.1
<b>III. Current Expenditures</b>	72.4	82.3	82.8	86.3	84.4	83.9
1. Personnel	18.1	15.8	17.8	17.0	18.6	18.8
2. Goods and Services	38.3	43.0	39.9	40.9	35.9	36.3
3. Property Rental	1.8	3.7	5.9	8.4	8.8	7.5
<b>IV. Capital Expenditures</b>	27.7	20.7	21.1	30.8	28.7	23.6
1. Civil Works	21.6	18.5	19.0	25.6	19.5	14.3
<b>V. Total Income</b>	93.4	95.2	94.6	100.3	110.8	122.0
<b>VI. Total Expenditures</b>	100.1	103.0	103.9	117.1	113.1	107.4
<b>VII. Current Result</b>	21.0	13.0	11.8	13.5	26.3	38.0
<b>VIII. Total Result</b>	<b>-6.6</b>	<b>-7.8</b>	<b>-9.3</b>	<b>-16.8</b>	<b>-2.3</b>	14.6
1. Primary Result	<b>-4.8</b>	<b>-4.1</b>	<b>-3.4</b>	<b>-8.4</b>	6.5	22.1
<b>IX. Financial Sources</b>	14.1	23.9	25.8	30.6	25.2	15.0
1. Decrease in Financial Investment	0.0	3.6	0.0	0.4	0.0	15.0
2. Public Indebtness	0.0	13.7	20.1	24.8	22.0	0.0
- Use of credit	0.0	13.7	16.9	24.8	20.8	0.0
- Domestic banking sector	0.0	13.5	16.9	24.8	20.8	0.0
<b>X. Financial Applications</b>	7.5	16.1	16.6	13.8	23.0	29.6
1. Financial Investments	0.0	0.0	8.7	0.0	6.7	0.0
2. Debt Amortization	7.5	15.4	7.0	13.5	11.2	29.6
<b>XI. Financial Balance</b>	0.0	0.0	0.0	0.0	0.0	0.0

Growth of Total Expenditures was 17% until the year 2001, with a strong increase in Current Expenditures, which grew about 19% in these 4 years; while Capital Expenditures increased nearly 11% (1998 – 2001) but had a u-shaped performance with a marked decrease in the years 1999 and 2000, and a leap in 2001 as a result of investment expenditures in the Javier Prado road civil works.

The expenditure reduction in the year 2002 is split equally among current expenditures and capital expenditures, with a sharp reduction in Goods and Non-personal Services. Deficit was around 2%. Expenditure-curbng policies implemented during the first trimester of 2003, in addition to capital expenditures below the average of the last years, result in a significant improvement in MML finances.

Although revenues showed an increase, they were insufficient to cover the growth of expenditures during the first years. The important increase in Tax Income and other levies, which occurred in 2002, and its favorable projection, marks an encouraging outlook for municipal finances.

On the other hand, the permanent and significant positive Current Result of MML must be noted. It clearly implies that deficit and indebtedness derived from it were produced as a consequence of capital expenditures. The municipal investment plan had a continued deficit in public accounts, and, in

consequence, an increasing public indebtedness was observed on the part of the municipality, as it had to resort to loans of different kinds to cover its contracted obligations. The principal sources of funding for MML's expenditures were: the floating debt and the domestic banking sector, through short and medium term credits, and overdrafts.

Debt stock grew by nearly 47% between 1998 and 2002, amounting to US\$ 104.8 million, as observed in Table 2; the dynamic component was domestic bank loans, which multiplied by 8 in those 5 years. The policy of optimization of Treasury balances, which is currently implemented, in addition to income-increase and expenditure-curbing policies, is producing an important financial rearrangement and a significant debt reduction in the current year.

**Table 2. Debt Stock 1998-2003 (US\$ million)**

Debt	1998	1999	2000	2001	2002	2003*
<b>I. Banking Debt</b>	20.3	24.4	34.3	47.5	57.1	43.8
1. Domestic Banking Sector	17.5	21.3	31.4	44.8	54.5	41.4
- Loans	4.3	14.0	21.8	32.8	42.4	35.3
- Overdrafts	13.2	7.3	9.6	12.0	12.1	6.0
<b>II. Floating Debt</b>	51.0	45.2	48.4	46.5	47.7	31.5
<b>III. Debt Adjustment</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>IV. Total Debt Stock</b>	71.3	69.7	82.7	94.0	104.8	75.2
<b>V. Availability</b>	10.8	7.2	15.9	15.5	22.2	7.2
<b>VI. Net Debt</b>	60.5	62.4	66.8	78.5	82.6	68.1
<b>VII. Debt Service</b>	9.3	19.1	13.0	21.9	20.0	20.8

Duplication of Bank Debt stock in 2001 with respect to 1999 was due to the execution of the investment of Javier Prado road works, and the increase in 2002 corresponds to the concretion of a new loan from the domestic banking sector for the future execution of the proposed project. This amount is immobilized in Treasury accounts; for this reason, the table also shows the evolution of the net debt of Treasury balances.

High bank overdrafts are clearly due to financial difficulties of any jurisdiction with a deficit, which must resort to loans to cover its most urgent obligations (such as personnel salaries), inasmuch as the high level of floating debt does not allow for further delay in payments.

In parallel, MML employed a policy of maintaining high Treasury Balances (over US\$ 22.2 million in 2002) and simultaneously requesting bank overdrafts. This policy was due partly to municipal legislation, which does not allow the use of funds from accounts of a specific type for other purposes. This entails an important cost for the municipality, not only in terms of interest paid, but also in having immobilized resources on one side and an important floating debt on the other.

As of 2003, bank overdrafts are decreasing (the expectation is to eliminate them next year), and in turn there is intent to give better use to immobilized resources in treasury balances. A strategy of implementing a Fiscal and Financial Action Plan has already been launched by MML, and is detailed below.

### **3. General Financial Capacity of MML for the 1998-2003 period**

To assess in a concisely manner the financial capacity of MML for the period under analysis, there are three (3) key ratio indicators that provide a global financial performance and these are<sup>1</sup>: (i) *Total Result / Total Income*, (ii) *Debt Service / Total Income*, and (iii) *Debt Stock / Total Income*.

In accordance with the mentioned Law, the parameters to compare with these indicators to determine

eligibility to grant a loan guarantee are: values below 25% for indicator (ii) and below 100% for indicator (iii). In the case of indicator (i), Peruvian law stipulates the existence of a positive Primary Result for the average of the last three years.

As shown in the results of Table 3, the financial situation of MML is considered adequate and thus eligible for loan guarantee by the Peruvian government to obtain loans for investment in infrastructure civil works when all three indicators comply satisfactorily and simultaneously with the parameters.

**Table 3. Financial Indicators for MML**

<b>Indicators</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
I. Total Result / Total Income	-7.10%	-8.20%	-9.80%	-16.80%	-2.00%	11.90%
1. Primary Result / Total Income	-5.20%	-4.30%	-3.50%	-8.40%	5.90%	18.10%
a) Average of 1. period t, t-1 and t-2			-4.30%	-5.40%	-2.00%	5.20%
II. Debt Service / Total Income	10.00%	20.10%	13.70%	21.90%	18.10%	17.00%
III. Debt Stock / Total Income	76.30%	73.20%	87.40%	93.80%	94.60%	61.70%

The financial situation of MML has performed reasonably, although not optimally. As a consequence of increasing fiscal deficit until 2001, and mainly due to the unbalanced situation of that year, indebtedness and debt service have reached high levels during the first years of the current century. As has been mentioned before, the main sources of indebtedness have been bank loans and floating debt.

In particular, the deficit of the years 2000, 2001, and 2002 has been due to the increase in debt interest, and thus has resulted in the widening gap between total result and primary result. Debt Service is within reasonable limits as a consequence of MML concentrating an important part of its debt (more than 40%) in Floating Debt, which does not draw interest and does not present a definite payment schedule.

MML has been active in 2003 adopting financial policies that bring indicators of financial capacity to very reasonable conditions.

To summarize, after this general assessment of MML, and if the projections for the current year do materialize, it may be concluded that MML complies with the requirements of Law N° 27958 to access bank loans with guarantee of the Peruvian government.

#### **4. Fiscal and Financial Action Program for MML (PAFF)**

From the analysis and the fiscal information previously presented, it has been estimated that some of the indicators required by Law N° 27958 could soar if MML does not continue to take action with a set of measures tending towards positive financial projections for the current year.

If we add to the above that execution of the proposed project means US\$ 135 million, with loans for US\$ 90 million, it is easily noticeable that it is indispensable for MML to have a systematic and coherent Fiscal and Financial Action Program (PAFF), which will keep municipal finances within the specifications of the law, not only for the sake of its enforcement but also for the preservation of the financial soundness of the jurisdiction. The purpose of this section is to analyze whether MML has such a fiscal space which will enable it to carry out the proposed project in a convenient manner.

The PAFF proposed by MML will produce an increase in income and a curb on expenditures, and will be accompanied by measures aimed at the reduction of the impact of debt and its service through re-negotiation of conditions in order to re-adequate them both in schedule and costs (interest).

MML has drafted the mainlines of PAFF, and among the first steps to be taken has included (i) increase collection of overdue payments of the Tax Administration System (SAT) by US\$ 36 million; (ii) recover the Peruvian government's US\$ 8 million debt; (iii) implement an amnesty program, which will produce US\$ 8.5 million in resources for the current year; (iv) improve annual income by 10% starting 2004 and 1% starting 2005; (v) increase toll revenue by 17% in 2004 and 1% starting 2005; (vi) incorporate new tax payers into the Vehicle Tax through improvement of monitoring and consolidation of its Control and Collection system; (vii) begin financial re-structuring allowing a liberation of funds amounting to US\$ 12 million by eliminating bank overdrafts; (viii) maintain investment levels of the municipal corporation within US\$ 29 million annually, in addition to resources assigned to the Lima Bus project, and, finally; (ix) maintain strict austerity in corporate expenditures related to purchase of goods and services. MML is also negotiating a re-structuring of interest rates with Banco de la Nacion and Banco Wiese, with respect to short and medium-term debts with these banks.

Tables 4, 5, and 6 shown below contain projections of the major fiscal variables and the indicators of the financial capacity of MML required by Law N° 27958, projected from 1998 through 2015. The indicator of Primary Result has been added, excluding the proposed project, which the national government should consider as a reference to observe the financial performance of MML while the project is executed and avoid distortions, which may be temporarily produced during repayment of the debt.

An analysis of the projected numbers indicates that MML is on the road to fiscal and financial sustainability and within the current legal framework, although to do so it must comply with the proposed PAFF, continue with the actions it has already begun, and design and implement other actions necessary to achieving fiscal and financial goals equivalent to the calculated projections. If this program is achieved, MML will show an important surplus and a noticeable process of liability reduction.

**Table 4. Historical and Projected Income and Expenditures, 1998 - 2015**  
(US\$ million)

Budget Execution and Projections	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
I. Current Income	93.4	95.2	94.6	99.8	110.7	121.9	128.8	130.0	129.9	132.6	134.0	135.3	136.6	138.0	139.4	140.8	142.3	143.7
II. Capital Income	0.0	0.0	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
III. Current Expenditures	72.4	82.3	82.8	86.3	84.4	83.9	83.9	81.5	86.0	86.5	86.9	87.2	87.6	88.0	88.5	89.0	89.5	90.1
IV. Capital Expenditures	27.7	20.7	21.1	30.8	28.7	23.6	60.9	67.1	65.5	27.9	20.9	20.9	21.0	21.1	21.1	21.1	21.2	21.2
- Lima Bus Project							37.4	46.3	44.7	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V. Total Income	93.4	95.2	94.6	100.3	110.8	122.0	128.9	130.1	131.4	132.8	134.1	135.4	136.8	138.2	139.5	140.9	142.4	143.8
VI. Total Expenditures	100.1	103.0	103.9	117.1	113.1	107.4	144.8	148.5	151.4	114.4	107.8	108.2	108.6	109.1	109.6	110.1	110.7	111.3
VII. Current Result	21.0	13.0	11.8	13.5	26.3	38.0	44.9	48.6	45.4	46.1	47.0	48.1	49.1	50.0	50.9	51.9	52.8	53.6
VIII. Total Result	-6.6	-7.8	-9.3	-16.8	-2.3	14.6	-16.0	-18.4	-20.0	18.3	26.3	27.2	28.2	29.1	30.0	30.8	31.7	32.5
2. Primary Result Excluding Project						22.1	28.0	31.3	31.7	32.0								
IX. Financial Sources	14.1	23.9	25.8	30.6	25.2	15.0	28.1	30.9	29.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1. Decrease in Financial Investments	0.0	3.6	0.0	0.4	0.0	15.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Public Indebtness	0.0	13.7	20.1	24.8	22.0	0.0	26.6	30.9	29.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X. Financial Applications	7.5	16.1	16.6	13.8	23.0	29.6	12.1	12.5	9.8	23.0	26.3	27.2	28.2	29.1	30.0	30.8	31.7	32.5
1. Financial Investments	0.0	0.0	8.7	0.0	6.7	0.0	0.0	0.0	0.0	0.0	13.4	18.7	20.0	21.3	22.4	23.5	24.5	25.5
2. Debt Amortization	7.5	15.4	7.0	13.5	11.2	29.6	12.1	12.5	9.8	23.0	12.8	8.6	8.2	7.8	7.6	7.3	7.1	7.0
XI. Financial Balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Table 5. Projection of Major Debt Indicators  
(US\$ million)**

Debt	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>I. Bank Debt</b>	20.3	24.4	34.3	47.5	57.1	43.8	56.6	82.4	107.9	106.0	97.0	88.4	80.3	72.4	64.9	57.5	50.4	43.4
<b>II. Floating Debt</b>	51.0	45.2	48.4	46.5	47.7	31.5	33.2	25.8	20.3	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>III. Total Debt</b>	71.3	69.7	82.7	94.0	104.8	75.2	89.8	108.2	128.2	109.8	97.0	88.4	80.3	72.4	64.9	57.5	50.4	43.4
<b>IV. Availability</b>	10.8	7.2	15.9	15.5	22.2	7.2	5.7	5.7	5.7	5.7	19.1	37.8	57.9	79.1	101.5	125.0	149.6	175.1
<b>V. Debt Service</b>	9.3	19.1	13.0	21.9	20.0	20.8	18.7	8.4	11.2	13.2	15.2	14.1	13.2	12.3	11.6	10.9	10.3	9.7

Table 6 shows the evolution of the most critical indicators presented by MML, referring to the ratio Debt Stock / Total Income. As may be appreciated, application and follow-up of the PAFF improves the fiscal and financial situation of MML.

**Table 6. Projection of Major Indicators of MML Financial Capacity**

INDICATORS	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>I. Total Result / Total Income</b>	-12,4%	-14,1%	-15,2%	13,8%	19,6%	20,1%	20,6%	21,1%	21,5%	21,9%	22,2%	22,6%
1. Primary Result/Total Incomes	-7,2%	-11,6%	-9,9%	18,8%	24,2%	24,2%	24,3%	24,3%	24,4%	24,4%	24,5%	24,5%
2. Primary Result Excluding LimaBus/Total Income	21,8%	24,0%	24,1%	24,1%								
<b>II. Debt Service / Total Income</b>	14,5%	6,5%	8,5%	10,0%	11,3%	10,4%	9,6%	8,9%	8,3%	7,7%	7,2%	6,8%
<b>III. Debt Stock / Total Income</b>	69,7%	83,1%	97,5%	82,7%	72,3%	65,3%	58,7%	52,4%	46,5%	40,8%	35,4%	30,2%

## 5. Monitoring Indicators and Financial Conditions for the Operation

In order to avoid a financial deficit of MML generated by the proposed project, it had been initially agreed that MML and the Banks would continuously monitor the fiscal and financial situation of the municipality.

To monitor the fiscal situation, there was an agreement to use the following ratio monitoring indicators:

- Total Result / Total Income
- Debt Service / Total Income
- Debt Stock / Total Income

To this effect, three levels of supervision have been proposed for the fiscal and financial situation of the municipality. Table 7 shows these levels, which will be used in the following manner: on Level 1, when the indicators fall within these ranges, MML will only continue with the execution of the proposed PAFF and the approved program of municipal income and expenditure; Level 2, when at least one indicator is recorded or found at this level, would signal the beginning of a phase of attention and detailed monitoring of the causes that triggered the indicator; and on Level 3, when at least one indicator is recorded at the third level, MML would be required to take corrective measures to solve the financial problem in such a manner as to redirect the fiscal situation to a sustainable course. The mentioned levels are described below:



**Table 7. Levels of Operation Supervision**

<b>Indicator</b>	<b>Level 1</b>	<b>Level 2 Monitoring</b>	<b>Level 3 Remedial</b>
Total Result / Total Income	+	Between 0% and - 2%	< than - 2%
Debt Service / Total Income	< than 12%	Between 12% and 16%	> than 16%
Debt Stock / Total Income	< 140%	Between 140% & 170%	> than 170%

The recently sanctioned law imposes stricter limits than those agreed upon with banks as shown in Table 7. Since compliance is obligatory for MML, such indicators and their limits must be adopted. If not so, MML would not abide by the law, and the national government would not guarantee the operation.

With due respect for the spirit of original agreements, and considering the new legislation, the set of indicators would remain as follows:

- (i) Primary Result Excluding Lima Bus Project / Total Income
- (ii) Debt Service / Total Income
- (iii) Debt Stock / Total Income.

The new levels would be marked by:

**Table 8. Levels of Operation Supervision-Law 27958**

<b>Indicator</b>	<b>Level 1 Normal</b>	<b>Level 2 Monitoring</b>	<b>Level 3 Remedial</b>
<b>Primary Result excluding Lima Bus / Total Income</b>	> than 20%	Between 10% and 20%	< than 10%
<b>Debt Service / Total Income<sup>2</sup></b>	< than 15%	Between 15% and 20%	> than 20%
<b>Debt Stock / Total Income</b>	< 85%	Between 85% & 100%	> than 100%

There is a continuation of the strategy in which MML, in order to ensure its fiscal sustainability, will prepare an annual fiscal program which not only secures the budget entries demanded by the project but also the necessary coherence to preserve municipal fiscal soundness.

In the event that the PAFF proposed by MML should not attain the expected results, (as expressed by the monitoring indicators mentioned above) partially or as a whole, MML itself must propose alternative measures and actions to correct the fiscal and financial situation. Such measures must be deemed satisfactory by the Banks, and should be translated into the pertinent municipal norms.

## **6. Financial Conditions for the Loan Agreement**

Suggested financial conditions, which MML should meet for the negotiation of credit operations and posterior development, are as following:

1. MML must present, through SAT, an annual PAFF to the satisfaction of MEF, the Banks, and in compliance with Law N° 27958. Information related to PAFF should be based on the last available

monthly budget executions on the impact of implemented and intended measures on the municipal fiscal-financial situation. In addition, it must include budget entries demanded by the project and be consistent with the preservation of the fiscal soundness of the municipality.

2. Semester reports on Fiscal and Financial Follow-up must be presented of these ratio indicators. MML must conduct a permanent (monthly) monitoring of the fiscal and financial situation, and draw projections using budget execution and pertinent information prepared by the municipality on a monthly basis. If MML were to observe a sudden increase in the level of any of the indicators, the Bank must be informed and corrective action undertaken, with preparation of reports explaining the causes and proposing remedial measures aimed at the correction of the fiscal-financial deviation.

In relation to the indicator Debt Stock / Total Income shown in el Table 9, it has been agreed that in the event of a that the law should become more flexible with respect to the 100% maximum value limit on this indicator, the indicator should vary accordingly. Also, the same will be true for the threshold to Level 3 for monitoring of the project and a 1. proportional magnitude for the threshold to Level 2. The highest value of entry to Level 3 acceptable by the Bank should be no higher than 170%.

**Table 9. Supervision Levels for LA.**

<b>Indicator</b>	<b>Level 1 Normal</b>	<b>Level 2 Monitoring</b>	<b>Level 3 Remedial</b>
<b>Primary Result Excluding Lima Bus / Total Income</b>	> than 20%	Between 10% and 20%	< than 10%
<b>Debt Service / Total Income<sup>3</sup></b>	< than 15%	Between 15 % and 20%	> than 20%
<b>Debt Stock / Total Income</b>	< 85%	Between 85% and 100%	> than 100%

## 7. Trust Fund

For repayment of debts to the Bank it is important that MML supply warranty of repayment and not transfer to the Peruvian Government the responsibility or risk of repaying the financing during the operation of the project. With this in mind, it has been agreed with MML and the Ministry of Economy and Finance to establish a trust fund whose responsibility is to act as payment agent to the creditor banks. This function will be performed based on the acquired right to receive municipal funds from ear-marked sources, and with the right to include other funds when revenues are not sufficient to satisfy the minimum agreed requirements.

Peruvian legal framework allows the creation of a great variety of trust funds, and the characteristics on the repayment scheme of the project are not difficult to incorporate. Preliminary discussion with officers of Ministry of Economy and Finance evidenced a national preference to avoid close involvement in this operation. The Ministry of Economy and Finance envisions it's responsibility as a credit guarantor, leaving to the Municipality the responsibility of acting with the banks directly.

One important aspect in the design of the trust fund and in the definition of payment procedures is that the Peruvian Government and the Municipality will make a loan agreement establishing the payment terms and conditions of MML to the nation in case that the latter pays the Banks on behalf of the Municipality.

Chart 1 presents main components of the repayment structure recommended for the proposed project. The split lines represent contingent scenario, such as the intervention of the Peruvian Government in the repayment of part of the bank debt, and the available options to recover the resources used for repayment to

the banks.

In order to make the trust fund operative, MML must develop the following tasks:

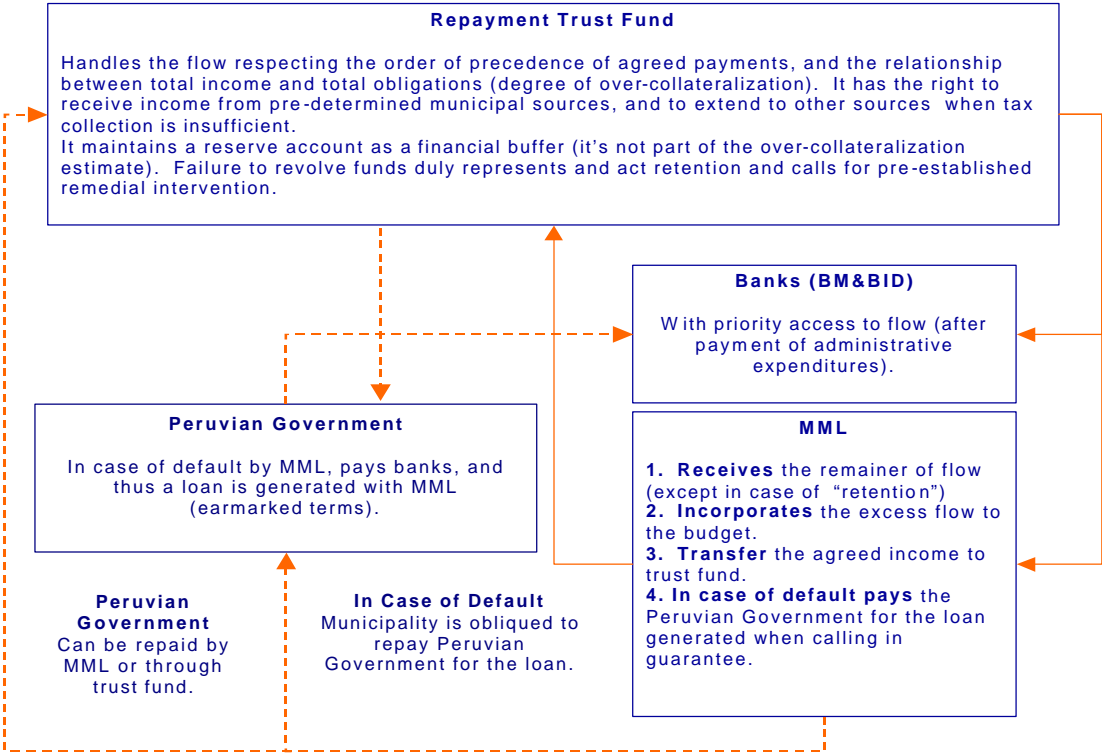
- Define the functional characteristics of the fund structure.
- Propose the municipal income that would be included in the repayment, both basic and contingent.
- Define the terms and conditions of the loan between the Peruvian Government and the municipality in case the warranty is called, and
- Establish the precedence of payments made by the trust fund.

It has been initially proposed that the income to fund the financing must include tolls, property taxes, and resources liberated due to cuts in the capital investment. Additional income (contingent) may extend to an increase in vehicle taxes, among others.

The degree of over-collateralization (or over-warranty) of the structure should be set at 1.10 at least, this is to say, the current value of the income flow ear-marked for the trust fund must exceed the current value of payments by 10%.

It has been proposed that the trust fund’s reserve fund amount to the equivalent of six months advance payment which would correspond to a due-date of the debt’s services, establishing clear procedures for the resolution of any liquidity problem or other events that could affect the repayment of the contracted debt.

**Chart 1 – Conceptual Structure of Trust Fund and Repayment Flow**



## Recommendations

As evidenced in the previous sections, MML can absorb the US\$ 90 million debt to finance the proposed project as long as a financial and fiscal program is implemented and the income sources to be used in the trust fund and to finance the project are clearly established.

The sovereign guarantee offered by the Peruvian Government should not introduce a bias in the financing if a payment structure (trust fund) is defined which will not offer incentives to the borrower (in this case MML) to deploy the payment risk to the government.

This structure will be established according to pertinent national legislation and will be granted the necessary faculties to fulfill its purposes:

- Receive freely available funds from ear-marked sources of municipal income automatically.
- The amount of assigned (or committed) income must reach a ratio, in each period of: assigned income: debt service of at least 1.3.
- Pay directly to banks the amounts corresponding to the debt service.
- Maintain on reserve an amount equal to at least 6 months of debt service.
- Prepare semestral reports of the financial structure of the repayment structure, and
- Notify the MML, MEF and Banks about any flaw or inconvenient which could arise in the repayment structure and which could prevent it from fulfilling its purpose.

The selection of the trust fund institution, the complete definition of the repayment structure, as well as the document contracts, and legal covenants must be prepared and ready to be put into effect before the signing of the loan agreement.

The repayment structure will be put into effect after the signing of at least one loan agreement, and after payment of the committee commission of at least one loan from a bank associated to the project.

---

<sup>1</sup> It should be made clear that the Law mentions Current Income and expresses that it is equivalent to: "All resources... excluding ...those correspondent to the transfer of assets of its property, the use of balances of previous exercises and operations of internal or external credit". This definition is coincident with this analysis marking it as total income, as MML has not gained additional resources or income through privatizations.

<sup>2</sup> Although the law allows up to 25%, the Banks and MML have agreed that this figure is too high; hence, this superior limit to take remedial action.

<sup>3</sup> Although the law allows up to 25%, the Banks and MML have agreed that this value is too high; hence, this superior limit to take corrective action.

**Additional GEF Annex 5: GEF Project Schedule  
PERU: LIMA TRANSPORT**

Actividad	Año 1		Año 2		Año 3		Año 4	
	1s	2s	1s	2s	1s	2s	1s	2s
<b>Fase Pre-operación</b>								
Organización	█							
Licitaciones	█							
Firma de Convenios	█							
Evaluación de Línea Base	█							
<b>Ejecución</b>								
Desguazar vehículos		█						
Implementar el Fondo de Garantía		█	█	█	█	█	█	
Desarrollo de capacidades institucionales		█	█	█	█	█	█	
Reconversión laboral para afectados de desguace		█	█	█				
Desarrollar el sistema de créditos para bicicletas		█	█	█	█	█	█	
Reconstruir y rehabilitar ciclovías		█	█	█				
Campañas y promoción de uso de las bicicletas		█	█	█	█	█	█	
Monitoreo		█	█	█	█	█	█	
Operaciones de cierre								█
Evaluación final								█

## **Additional GEF Annex 2: Incremental Cost Analysis for the GEF Project PERU: LIMA TRANSPORT**

### **A. Concept and Baseline**

In accordance with OP 11, significant CO<sub>2</sub> emission reductions can be achieved through the rationalization of the public transport system accompanied by a reduction in the public transport oversupply and a modal shift towards low or zero-emission modes of transportation.

#### **A.1 Optimization of the public transport vehicles fleet size**

Other Latin American cities plagued with the proliferation of public transport services have already tried to address the problem through bus retirement programs, which in their majority were camouflaged blanket subsidies to the operators, through the purchase of their units at above-the market prices. The Bogotá example is quite different in the sense that the bus retirement scheme was framed into a wider project of segregated busways, which allowed the rationalization of public transport services and made easier the implementation of a bus retirement program, of which bus concessionaires were made financially responsible (for each new articulated bus introduced in the system, bus concessionaires were asked to buy back and scrap x old vehicles to be awarded the concession).

The Municipality of Lima has decided to make an investment in improving urban transport through a segregated busway project for which IDB and WB support has been required. This project will finance 24 km of segregated busways which will be concessioned out to the private sector. As in Bogotá, the future concessionaires will be asked to buy and scrap a predefined number of old buses before being formally awarded the concession. The proposed GEF grant will support the whole scheme and contribute to the optimization of the public transport vehicles fleet size.

The GEF fleet size optimization component builds on the Bogotá experience but tries to maximize the number of buses eliminated through providing financial incentives which should entice bus concessionaires to go beyond the minimum number of buses to be scrapped required in the bidding documents. The additionality of the GEF component lies in the difference between the number of buses that would have been eliminated according to the minimum requirements (baseline) and the total number of buses which will be eventually eliminated. The additional environmental impact will stem from a reduction in GHG emissions from those additional buses to be scrapped thanks to the GEF-financed financial incentive scheme.

#### **A.2 Promotion of Bike Use**

As far as the NMT component is concerned, bike use in Lima is refrained by several factors which include the poor quality of the present bikeway maintenance, some flaws in the engineering design of those bikeways, traffic and personal safety problems, preconceived ideas against bike use, lack of bike-parking facilities, and the absence of a few missing links that affect the connectivity of the current network. The project, through a multi-pronged approach that will address every one of those aspects, is expected to raise substantially bicycle use and to leverage additional funds from the local municipalities to be dedicated to NMT, and to secure a NMT component currently envisaged in the framework of the World Bank loan. The additionality of the GEF component lies in the expected additional number of bike trips between the current stable numbers counted on the bikeways during the preparation phase and the final numbers at project closing. The additional environmental impact will stem from a reduction in bus trips and hence bus emissions due to a modal shift to NMT.

## B. Proposed GEF case

### B.1 Bus Retirement

#### B.1.1 Emissions from the public transport sector in Lima

On the basis of the emissions factors per vehicle type for both CO<sub>2</sub> and PM This analysis focuses on CO<sub>2</sub> for its role in climate change and hence its prime importance in the eyes of the GEF, and PM because it is now considered as the most dangerous of all air pollutants in Lima. The same calculation can be carried out for any other pollutant, the fleet composition in Lima and the average number of km per bus and per month, the emissions that can be attributed to public transport are the following:

#### CO<sub>2</sub>

	number of vehicles	gCO <sub>2</sub> / veh-km	km / month	tCO <sub>2</sub> /year
LDV	32,357	383	4,849	721,391
Microbus	11,577	604	4,904	411,420
Regular Bus	14,605	1,208	6,190	1,310,261
	58,539			2,443,071

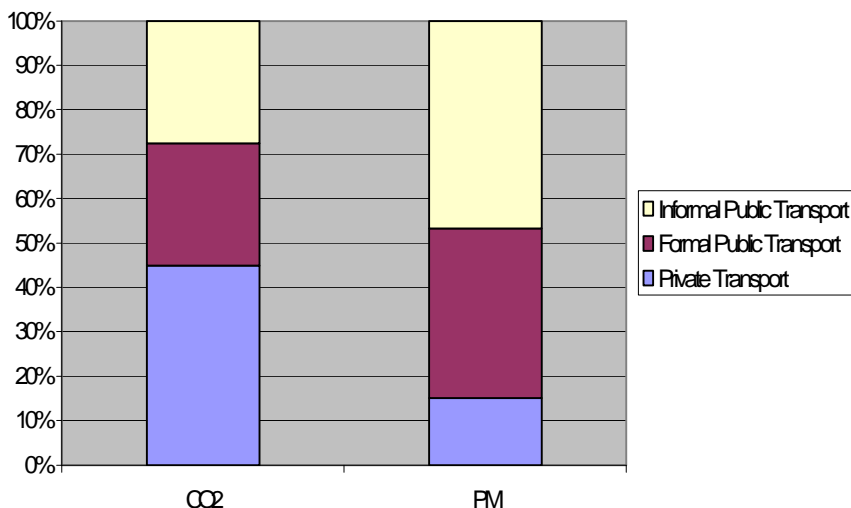
#### PM<sub>10</sub>

	number of vehicles	gPM/ veh-km	km / month	tPM/year
LDV	32,357	1.23	4,849	2,316
Microbus	11,577	1.51	4,904	1,029
Regular Bus	14,605	2.01	6,190	2,181
	58,539			5,525

Around 55% of CO<sub>2</sub> and nearly 85 % of PM emissions from the general transport sector come out from the public transport in Lima. From these values 50% of CO<sub>2</sub> and 45% of PM are caused by the vehicles authorized by DMTU, as illustrated in the graph below:



Pollutant sources from within the transport sector



***B.1.2 Emissions reductions expected from the bus public transport fleet optimization component.***

According to the financial analysis carried out regarding the capacity of the guarantee fund, the corresponding GEF component will trigger the additional removal of either 837 light-duty vehicles (camionetas rurales), 384 minibuses or 335 regular buses or a combination of the three types. As long as  $C = ax + by + cz$ , C being the Guarantee Fund capacity, a the number of light duty vehicles to be scrapped, x the average market price of those light duty vehicles, b the number of minibuses to be scrapped, y the average market price of those minibuses, c the number of regular buses to be scrapped, z the average market price of those minibuses. This assumes the following market values:

- Light-duty vehicles: US\$ 3,000
- Minibuses: 6,500
- Regular Buses: 7,500

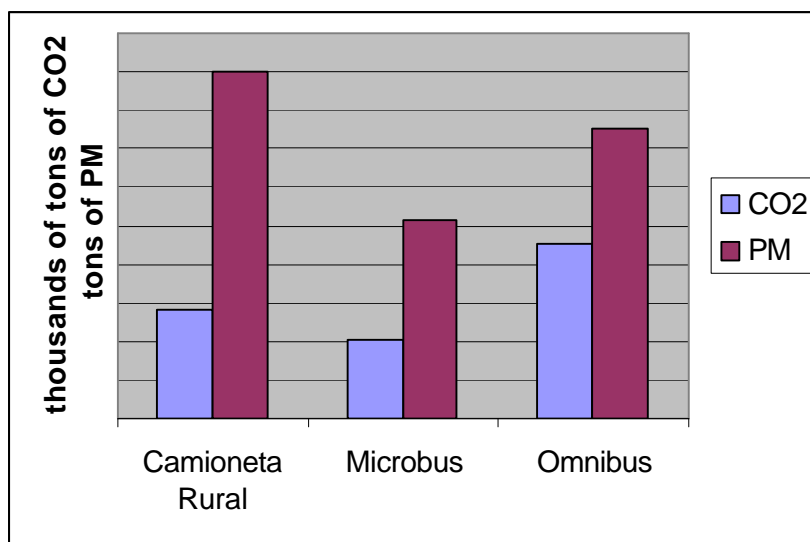
This raises several comments:

- (i) First, how to maximize the amount of CO2 (PM10) emission reduction? This depends on the price, and the amount of CO2 (PM10) emitted per each type of vehicle. As far as reducing pollution is concerned, the optimal option is to focus on those vehicles which maximize the ratio: CO2 (PM10) emitted per year / market price.

The following table shows the results of this analysis:

	Market Price	gPM/ veh-km	km / month	kgPM/year	US\$/kgPM
LDV	3,000	1.23	4,849	72	41.92
Microbus	6,500	1.51	4,904	89	73.15
Regular Bus	7,500	2.01	6,190	149	50.23
	Market Price	gCO <sub>2</sub> / veh-km	km / month	tCO <sub>2</sub> /year	US\$/tonCO <sub>2</sub>
LDV	3,000	383	4,849	22	134.56
Microbus	6,500	604	4,904	36	182.90
Regular Bus	7,500	1,208	6,190	90	83.60

(ii) Second, maximizing CO<sub>2</sub> emission reduction does not mean necessarily maximizing PM<sub>10</sub> reduction, as shown in the graph below:



Regular buses emit twice as much CO<sub>2</sub> as microbuses but only one third more PM. An explanation is that they usually belong to more formal companies (they represent a higher upfront investment) with better maintenance capacities, and hence a lower rate of PM emissions per liter of diesel. In the case of Lima, Regular Buses appear to be the best solution for CO<sub>2</sub>, and LDVs for PM.

(iii) Third, following up on the second point, GEF priorities might be conflicting with local priorities since PM is a much more worrying issue than climate change for Lima authorities due to its heavy health impacts. In addition to this, the bus retirement component aims at reducing congestion and from this perspective, the best option is to go for LDVs: in terms of urban road space use, it's more efficient to focus on the smaller vehicles since they are those who need most road space per passenger. At the same time, the LDV option is maximizing the negative social impacts because it would affect more drivers and bus owners. There is a very delicate and politically sensitive trade-off between those sometimes conflicting objectives (global pollution, local pollution, congestion, social impacts) that has to be carefully examined. At this stage, ProTransporte, the

implementing agency of the Lima Transport Project, has not decided yet which way to go but one option could be to let concessionaires choose between the different options, demanding that for each articulated bus introduced in the new system, they can either scrap 2 regular buses, or 3 minibuses or 6 LDVs. Then, actual market prices will orient their final choice, very probably towards the oldest and hence most pollutant vehicles which are the cheapest ones.

- (iv) The values calculated in the table above (US\$/avoided ton of CO<sub>2</sub>) have to be handled with care. On one hand, the emissions avoided taken into account are those avoided on a yearly basis. Those buses are likely to keep operating still five or more years if the bus scrapping scheme doesn't materialize, which means that benefits per US\$ can be five or more times higher. On top of that, those dollars are not "spent", they feed a revolving fund which will be set in such a way that it can be used over and over again. On the other hand, looking at the broad picture, the bus retirement component is viable only if the social impacts it will generate are taken care of through the social mitigation program. This adds to the total cost of the operation but will help those affected to find job opportunities outside the transport sector, i.e. it should avoid that those very same persons buy another vehicle and continue to provide public transport services with supernumerary old and polluting vehicles for years. To conclude, it is quite complicated to carry out in this context an analysis to check that GEF money is adequately spent and that the "climate-change related" rate of return of the operation (measured in US\$ of GEF money / avoided ton of CO<sub>2</sub>) is in the range of what is expected or similar to the market price of CO<sub>2</sub>. The only dollars actually spent are those who finance the social impacts mitigation program and not those which feed the Credit Guarantee Fund.

Ultimately, the benefits on CO<sub>2</sub> emissions and PM emissions expected from the GEF role are the following:

	Potential fleet reduction due to GEF (buses)	gCO <sub>2</sub> /veh.km	km/month	avoided tCO <sub>2</sub> /year
LDV	837	383	4,849	18,650
Microbus	384	604	4,904	13,656
Regular Bus	335	1,208	6,190	30,036
	Potential fleet reduction due to GEF (buses)	gPM/veh.km	km/month	avoided tPM/year
LDV	837	1.23	4,849	60
Microbus	384	1.51	4,904	34
Regular Bus	335	2.01	6,190	50

## B.2 Promotion of Bike Use

### B.2.1 Basic Assumptions:

The environmental assessment of the bikeway component is based on the following assumptions:

- Bicycle use will triple over the next four years along the bikeways that are part of the extension and rehabilitation program. This might sound overoptimistic but recent traffic counts showed that bike use is currently above 1995 levels even though those bikeways are in very bad shape and deemed dangerous. We believe that this increase takes place in spite of the dire current

bicycling conditions allows us to be quite optimistic regarding the impacts of the NMT component.

Bike use on the bikeways to be rehabilitated under the project is currently estimated to be around 3,600 trips per day. This environmental analysis assumes that an additional 7,200 bicycle trips will be triggered by the GEF project.

- It is clear that most of future bikeway users will be diverted from buses and not from private cars (contrary to what is expected from the GEF Santiago Transport and Air Quality Project) since those bikeways are located in low-income neighborhood and that their use is often explained by economic reasons. In the calculations, it was assumed that all future bike users are former bus passengers. It might be that some will be diverted from cars (we in this case underestimate the impact), some others will be former pedestrians (in this case, we would overestimate the impact), but we assume that those numbers are quite small and would balance each other in the final results.
- We assumed that, if the average number of daily passengers per a given type of public transport vehicle is X, then once we attract X bus passengers on the bikeways, automatically one of those buses disappears from the market. This ignores the inertia of the system but seems to be a reasonable hypothesis on the medium term. Some may argue that this underestimates the impact since bus operators are making very marginal profits and hence that diverting a whole “busload” of passengers would affect many more buses than just one.

### ***B.2.2 Emissions reductions expected from the Bike Use Promotion Component***

The results are the following, for both CO<sub>2</sub> and PM, on a yearly basis:

	share of total public transport passengers per vehicle type	Average number of daily trips (in passengers) per vehicle type	passengers of each vehicle type that would switch to NMT in 2006	number of vehicles that would have to stop operating	avoided ton of CO <sub>2</sub> emissions per year
LDV	43%	250	3118	12.5	278.1
Microbus	24%	380	1736	4.6	162.3
Regular Bus	33%	480	2346	4.9	438.4
			7200		<b>879</b>
	share of total public transport passengers per vehicle type	Average number of daily trips (in passengers) per vehicle type	passengers of each vehicle type that would switch to NMT in 2006	number of vehicles that would have to stop operating	avoided kg of PM emissions per year
LDV	43%	250	3118	12.5	231
Microbus	24%	380	1736	4.6	48
Regular Bus	33%	480	2346	4.9	59
			7200		<b>338</b>

## **C. Some comments**

In quantitative terms, it is tempting to compare the results yielded by the two main components, the bus retirement one and the NMT one. The benefits of the bikeways in terms of CO2 emission reductions are low compared to those of the bus retirement program but two caveats have to be made here : (i) first, the public transport fleet optimization component is made possible through the complementary infrastructure investments (IDB and WB loans + counterpart funds) which is a US\$ 126 million project, and through the participation of the private operators who will have to finance the purchase of the old buses. This means that the benefits of the bus retirement cannot be attributed exclusively to the GEF component, even though it is the GEF money which will make possible the retirement of additional buses which otherwise would continue to circulate. (ii) second, the NMT project is expected to yield benefits probably more in the long and medium terms than in the short term, given that its success depends from a cultural change which cannot be achieved overnight. The long-term benefits have not been estimated here because they depend on so many factors that providing any estimate would be abusive from a scientific point of view.

To put it briefly, it might be deceiving to carry out a rapid cost-benefit analysis on both components and to compare the results per US\$ spent.

## **D. Incremental Costs**

### **D.1 Caveat**

A rigorous incremental costs analysis is quite a delicate exercise in the context of this project : since part of the grant will be refunded or redeployed (Credit Guarantee Funds, micro-credits), what is the real incremental cost of the project? Since some components do not have direct environmental impacts, such as the capacity building one, how to measure the GHG emission reductions they will trigger? What is the time period over which benefits are to be estimated? The following assumptions have been made to address this questions:

- The total incremental cost of the project is US\$ 7.93 million, of which 1.0 is a credit guarantee fund and 0.35 will be used for micro-credits. It is worth mentioning here that depending on the exit strategy, these funds could be either refunded or redeployed to fund additional components which will generate additional GHG reductions, that were impossible to estimate here. The US\$ 7.93 million include as well the capacity building component and the social mitigation plan, which are not per se directly responsible for GHG emissions reduction but which are considered as indispensable to the project sustainability and which are expected to pave the way for policies that will generate further GHG emissions in the long term.
- Therefore, no short-term emission reductions have been directly associated neither to the capacity building component nor to the social mitigation plan, even though those two components are essential to the feasibility and sustainability of the project, and hence to maintain CO2 reductions on a long-term basis.
- The annual benefits derived from the public transport fleet optimization component have been multiplied per five, under the assumption than on average those buses would have kept operating five more years without GEF intervention. This assumption might be conservative since it does not take into account the fact that some of the bus owners or drivers to be retrained under the social mitigation program will hopefully leave the transport sector, while they would probably have bought another old and polluting vehicle when the one they use now had “died” if the GEF

had not offered them the possibility of working in another sector.

- The annual benefits of the NMT component have been multiplied by ten, without assuming a continuous increase in bike use but on the ground that NMT-related benefits have to been looked at on a much longer period since impacts are expected to be long-term. But this methodology might be overly conservative since it does not really take account of the long-term effects due to a cultural change vis-à-vis bike use and sustainable transport in general (but it seems to the team that any methodology trying to estimate the related long-term impacts would be quite vain and would lack any scientific basis. The monitoring process is expected to give an empirical answer to this problem. As a consequence, the estimated NMT related benefits represent between 3 and 6 % of the total estimated benefits.

## D.2 Final Results

Component	Baseline	Alternative	Incremental
<b>Segregated Busways and Bus Retirement</b>	<p>- Building of the busways and feeder roads  <b>US\$ 105.5 M</b> (37 % municipal counterpart funds, 31.5% IDB, 31.5 % WB)</p> <p>- Social Feasibility and Studies <b>US\$ 7.1 M</b> (37 % municipal counterpart funds, 31.5% IDB, 31.5 % WB)</p> <p>- Bidding docs demand bidders to scrap a predefined number of old buses. Private concessionaires expected to spend up to <b>US\$ 4.75 M</b> on buying old buses and to invest overall in the range of <b>US\$ 90 M</b> (terminals, workshops, depots and new buses)  <b>US\$ 112.6 M (apart from private sector)</b>  <b>US\$ 94.75 M (private sector)</b></p>	<p>The bidding documents for the bus concessions include a “voluntary” bus retirement option on top of the minimum requirement. GEF funds feed a Credit Guarantee Fund to facilitate additional bus retirement along with a social mitigation plan for those affected by the bus retirement and a pilot bus retirement program to improve bus retirement procedures.</p> <p>The amount of the Fund has been calculated so that the number of buses to be scrapped could be increased by 50%, i.e. the private sector would put up to an <b>additional US\$ 2.4 M</b> in this component.</p> <p><b>US\$ 114.3 M (apart from private sector)</b>  <b>US\$ 97.15 M (private sector)</b></p>	<p><b>Costs :</b>  US\$ 1.7 M (GEF funded)  US\$ 2.4 M (private sector funded)</p> <p><b>US\$ 4.1 M</b></p> <p><b>Benefits :</b>  § Up to 800 additional old public transport vehicles scrapped.  § Further reduction in congestion and in air pollution  § Additional GHG reduction of up to 30,000 tons per year  § Cleaner bus retirement procedures tested and monitored for Lima and Peru</p>

<b>Non-Motorized Transport</b>	Business as usual, i.e no extension of the bikeway network and poor maintenance of the existing bikeways. No attempt to trigger a cultural change vis-?-vis bike use	<p>§ GEF funds allow for : rehabilitation of the existing bikeways (32.5 km) Network extension (6.1 km) Promotion campaign</p> <p><b>US\$ 4.180 M (GEF)</b></p> <p>§ The Lima Municipality will restart the Plan Bici (<b>US\$ 600,000</b>).</p> <p>§ Municipal districts finance bikeways maintenance (<b>US\$ 750,000</b> during project life)</p> <p>§ Further extension through <b>US\$1M</b> assigned to bikeways through the WB loan</p> <p><b>US\$ 6.530 M</b></p>	<p><b>Costs :</b> US\$ 4.180 M (GEF funded) US\$ 1.350 M (public funds) US\$ 1 M (WB) <b>US\$ 6.530 M</b></p> <p><b>Benefits :</b> § Cultural change vis-?-vis bike use § Groundwork laid for further extensions of the network § Additional GHG reduction of up to 1,000 tons per year, to increase over time</p>
<b>Institutional Strengthening</b>	<b>5.3 US\$ M</b> (37 % municipal counterpart funds, 31.5% IDB, 31.5 % WB)	GEF funds amplifies the scope of the institutional strengthening component towards sustainable transport and NMT <b>6.4 US\$ M</b>	<p><b>Costs :</b> <b>1.1 US\$ M (GEF)</b></p> <p><b>Benefits :</b> Improved technical capacities at the municipal and national entities regarding sustainable transport. More sensibility to global and local environmental issues</p>
<b>Administrative Costs, Monitoring and Replication</b>	<b>5.4 US\$ M</b> (37 % municipal counterpart funds, 31.5% IDB, 31.5 % WB)	GEF funds finance the administrative costs related to the GEF-funded incremental components and co-finance the monitoring costs of the overall project. <b>6.35 US\$ M</b>	<p><b>Costs :</b> <b>0.95 US\$ M (GEF)</b></p> <p><b>Benefits :</b> The overall project is carefully monitored from a GHG perspective.</p>
<b>Financial Costs</b>	<b>1.6 US\$ M</b> (37 % municipal counterpart funds, 31.5% IDB, 31.5 % WB)		
<b>TOTAL</b>	<b>219.65 US\$ M</b>	<b>232.33 US\$ M</b>	<b>12.68 US\$ M</b>
<b>GEF Grant requested</b>			<b>7.93 US\$ M</b>

NB: the expected contribution of the private sector appears only in this incremental cost analysis and is not included in the total project costs elsewhere in the document. This contribution depends on several factors which are not yet determined and the numbers provided here are a reasonable estimate, which will be fine-tuned prior to appraisal.

## **Additional GEF Annex 4: Detailed GEF Project Description PERU: LIMA TRANSPORT**

### **1. Project Components**

The GEF financial aspects include four components: (i) to support the reduction in the public transport fleet oversupply, (ii) to consolidate the bikeways pilot project developed in Lima North Cone, (iii) to carry out an institutional strengthening program on sustainable transport, targeting municipalities and institutions dealing with environmental issues and/or transport planning, and (iv) to assess and monitor the GEF project performance.

Preparatory studies under GEF funding (PDF-B, US\$ 350,000) allowed to define in greater depth the activities of all components, and to prepare the related Terms of Reference.

#### ***1.1. To support the rationalization of the public transport fleet***

The activities to be developed in the framework of this first component aim at supporting the WB-IDB-financed Lima Transport Project, which will rationalize public transport services and provide opportunities to reduce the size of the current fleet operating in Lima (more than 55,000 buses, most of which are extremely polluting and obsolete). This component can be divided into three sub-activities:

Provide financial incentives to bus concessionaires in order to encourage them to retire additional obsolete and pollutant public transport vehicles

Support programs aiming at mitigating the social impacts of this program in terms of employment (training programs, access to micro-credits)

Co-finance with the loan a pilot project that will enhance the introduction in Peru of more environment-friendly vehicle retirement methods and that will build the local capacity required to make sure that the adoption of those new methods will be sustainable.

##### **1.1.1 Designing Financial Incentives to Encourage the Retirement of Aged and Polluting Public Transport Vehicles**

As part of the preparation work for the project, a study was carried out to design an incentive scheme to encourage the retirement of aged and polluting buses, in order to promote a reduction in the public transport oversupply and improve public transport attractiveness. Several alternatives were studied, including the direct financing of bus purchases and destruction, the provision of a guarantee on loans used to purchase and destroy old buses, etc (see Section D of the main text).

The study concluded that constituting a Credit Guarantee Fund was the alternative likely to lead to the greatest number of additional retired units. The Credit Guarantee Fund will be used to guarantee part of the loans obtained by the Lima Transport Project winning bidders in order to buy and retire aged polluting vehicles. The Fund will only be used to foster the retirement of additional bus units, above the minimum number required and achievable without the GEF intervention.

To achieve the above mentioned results, the bidding documents for the Lima Transport Project will require bidders to establish in their bid the number of aged buses they commit to buy back and retire if they win a concession. To encourage bidders to offer to retire the highest possible number of polluting units, the Lima Transport bidding documents will offer to award additional points, in the evaluation process, for each unit



promised to be retired in addition to the minimum required quota. This scheme was used for Transmilenio's second phase which required bus concessionaires to retire at least 6 LDVs per articulated bus (compared to 2.7 in the first phase). Due to the additional points awarded to those willing to retire more than the minimum required, the three winning concessionaires offered to retire 7.5 (two of them) and 8.9 LDVs per articulated bus introduced in the new system. Bogotá is not Lima, but this tends to prove that the whole scheme is feasible and that the concessions can be profitable enough to allow for a substantial bus retirement program without turning the business into something unprofitable and without putting unacceptable pressure on the fares. Pending on a decision to be taken by PROTRANSPORTE, bidder could offer a plan where they would specify how many buses they would buy back and retire every year along the concession duration. Units retired in the early years of the concessions would have a higher weight than units retired later (via an appropriate discount rate). Allowing bidders to expand their repurchases of old buses over the entire length of their concession should allow them to retire a higher number of buses. Their profits are indeed expected to be higher after the initial investments they will have to make (mostly to acquire their bus fleet) are partially paid for and amortized.

The Fund will then guarantee loans taken on by the winning bidders to finance **all the additional units** that their bids voluntarily propose to retire, plus **an equal quantity** of units from the minimum required quota (but not all of these required units).

For example, if the winner company promises to retire 2 **additional** LDVs (above the minimum quota), the Fund will guarantee loans issued to finance these 2 units plus 2 LDVs units of the minimum quota. In total, therefore, it will guarantee the financing of 4 units.

Such mechanism will apply until all of the units from the minimum required quota have possibly been financed by a guaranteed loan. Above such level, the guaranteed loan will still be available, but to finance additional units only.

The winning bidders will be expected to finance the purchase and retirement of the potentially remaining units of the minimum required quota via non guaranteed loans, equity and/or revenues from operation. A financial analysis of the proposed private operations is currently being conducted to define a feasible minimum required quota, given expected operational revenues and costs.

It is expected that the Guarantee Fund will help provide credits for up to five times the value of the Guarantee Fund. In this way, the US\$1.0 million allocated to the Fund should allow to retire units for a total amount of US\$ 5 million. This corresponds to either an additional group of approximately 750 minivans (or "combis"), 350 minibuses, or 300 buses. The US\$1.0 million was calculated on the basis of some preliminary estimates of the financial sustainability of the concessions and on the Bogotá experience, where the maximum amount of buses offered for retirement was close to 9. Assuming that the minimum requirement would be for the concessionaires to retire around 6 minivans per articulated bus introduced in the system (i.e. the current estimate of what could be reasonably demanded to concessionaires without jeopardizing the profitability of their business), and assuming that concessionaires will be willing to offer as many buses as in Bogotá (between 7 and 9), the Credit Guarantee Fund will have to back the purchase of approximately 3 additional buses per new bus articulated, i.e. approximately 1,000 minivans since the fleet of new buses is estimated to be around 350 units. This potential demand is quite uneasy to estimate since the number of buses to be retired is not only related to the financial sustainability of the concessions but as well on the strategic decisions that concessionaires will make when drafting their bidding proposals. They will have to find a trade-off between raising their chances of being awarded the concession and putting extra financial burden on themselves. Due to the relative unpredictability of the final outcome, the amounts to be used for this purpose will be disbursed against specific requests to back old buses purchase.

The GEF allocation for the Guarantee Fund could be deposited directly in one or several financial institutions, to guarantee the credit lines that these institutions would extend in favor of the winning companies of the Lima Transport concessions. In this case, the implementing agency (FONAM) would sign an agreement with the financial institutions, by which they would commit to offer loans to the winning companies backed up by the GEF deposit. The financial institution(s) would be selected competitively, based for instance on the conditions they would demand to borrowers (interest rate, maturities, other possible guarantees required, etc).

The Fund will guarantee a pre-determined amount of loan per unit retired (corresponding to the estimated average market value of an old vehicle, times a maximum acceptable leverage). The loans will have a pre-determined maturity (agreed with the financial institutions) and the guarantee will expand over the duration of the loans. The bidders will then be eligible to request a guaranteed loan equal to the pre-determined amount of loan per unit retired, multiplied by the number of units they propose to retire during the duration of each loan plus an equal number of units from the minimum quota.

For instance, if the loans have a three-year maturity, the bidders will be eligible to receive in year 1 of the concession a guaranteed loan equal to the pre-determined amount of loan per unit retired multiplied by the number of units he proposes to retire during years 1, 2 and 3 of the concession. The fund will be revolving, so that the same bidder will be eligible to receive another three year-guaranteed loan in year 4 of the concession to finance the units he proposes to retire in years 4, 5 and 6 of the concession, and so on until the end of the concession.

The key advantage for bidders is that the guarantee decreases the cost of the loans, as well as collateral requirements.

It is likely that the interest rate on these loans will be floating. This means that in later years of the concession, the bidders will be free to reject the loans they are eligible to get (if they found that their conditions had become not attractive). The probability that this happen is however low as the proposed financial mechanism should reduce the cost of loans, by the effect of the guarantee and because the Fund will be sufficiently capitalized to have a first class credit rating.

In order to reduce the credit risk involved, the repayment of the loans taken on with the guarantee of the Fund and payment of related interest charges will be made through the "Fiduciary Fund" that has to be established as part of the Lima Transport Project and that will be fed by the farebox revenues. The winning companies, at the time of requesting a loan guarantee from the Fund, will extend an authorization to the Fiduciary Fund to dutifully pay back the loan and interest charges from contributions they will make to the Fiduciary Fund from their operating revenues.

#### 1.1.2. Providing Support to Mitigation Plans Aimed at Offering other Job Opportunities to Displaced Public Transport Workers

The introduction of the Lima Transport Project changes the public transport system, and impacts bus-owners, owner-drivers, bus-drivers, and fare collectors. To mitigate these impacts, a social program has been designed, drawing on resources from a common fund established jointly by the GEF project and the Lima Transport Project. The GEF funds will solely support the incremental workers displaced by the GEF proportion of the bus retirement component.

The social impacts on bus owners will be partially offset by the market prices they will receive when they deliver their aged and polluting vehicle. Additionally, to avoid the possibility that the drivers purchase another old vehicle and re-enter the transport system, the social plan will train these persons for diverse

activities in other sectors.

The social program will aim at giving affected workers as many assets as possible to find new jobs outside the transport sector. To fulfill this aim, a special training and technical assistance program has been designed which covers all types of affected populations. A special revolving fund has been proposed to finance small businesses. This will be carried out in coordination with existing safety nets, such as those provided by Prompyme from the Ministry of Labour (Commission for the promotion of small and micro-enterprises, see <http://www.prompyme.gob.pe/>) and with renowned and experienced NGOs specialized in micro-credits such as Finca, Fovida, Edpyme, Edyficar, Banco Mibanco, ONG Alternativa, PRISMA, PROMUC, etc.

FONAM will select firms specialized in training, and will coordinate and supervise implementation of the social program. FONAM will be responsible for quality control of the program. The subjects of the training and technical assistance have already been proposed in the preparatory studies. The financial assistance program will be implemented by a specialized institution that will be properly identified through a public bid.

### *1.1.3. Implementing a Pilot Project in order to Test Various Retirement Methods*

As no relevant experience exists in Latin America, the feasibility and the real costs of establishing higher standards for bus retirement processes will be determined by conducting a pilot retirement of 150 units (50 of each vehicle category). These vehicles will be dismantled under realistic industrial conditions. The pilot study will focus on the dismantling process, classification and destination of all parts, evaluation of the required time for dismantling, and establishment of the quantities of the different materials to recover, parts that can be reconstructed, reutilized or recycled, parts that should be destroyed at the foundry, and parts that should be destroyed and directed to the sanitary landfills. This Pilot Project will be the basis for implementing more stringent but still realistic norms for old vehicles retirement, which will be used as the retirement process accompanies the next phases of the segregated busway program in the years to come, expectedly with the support of the revolving Credit Guarantee Fund which will still be available after the project closes.

### ***1.2 Consolidate and expand Lima bikeway network***

Through this component, the project will aim at resolving the problems identified in the context of the WB-financed non-motorized transport pilot program (1994) and that are seen as the explanatory variables of the still low levels of use of the North Cone bikeways. These problems are mainly linked to traffic and personal safety, low quality of the engineering design in some places, and lack of information and communication on the issue. This component can be divided into four sub-activities

Realize the required physical improvements on the existing network and extend it by 6 km of "missing links" to increase its connectivity,

Finance one year of bikeway maintenance during which municipalities will benefit from a hands-on training,

Equip bus stations with bike parking facilities

Finance a traffic safety audits of the bikeways

Carry out a promotion campaign on bike use,

Restart the dormant credit program for bicycles acquisition, through making it more flexible and applicable to the financing of small bike-related businesses.

### 1.2.1. Physical Improvements and Extension of the Existing Bikeway Network

During the preparatory study, an assessment “block by block” was carried out to help to design the improvements in the existing bikeways network (Colonial, Universitaria, Tomas Valle avenues), whose characteristics are displayed in the following table:

<b>Bikeways</b>	<b>Existing (Km.)</b>	<b>Planned Extension</b>	<b>Total (Km.)</b>
Av. Colonial	10.8	-----	10.8
Av. Universitaria	10.4	4.1	14.5
Av. Arequipa	6.0	2	8.0
Av. Tomás Valle	5.3	-----	5.3
<b>TOTAL</b>	<b>32.5</b>	<b>6.1</b>	<b>38.6</b>

The improvements will include safer exits, realignment of curbs to facilitate car access to neighboring properties, intersections improvements to enhance traffic safety, and traffic calming measures. The Universitaria Ave. bikeway will be extended 4 km to connect the **San Marcos and Católica** Universities to the network.

The following table shows the construction works to be done:

<b>Existing bikeways</b>	<b>Construction works to be done</b>
Colonial Ave.	Rehabilitation of curbs, pavement and sidewalks. Some intersections will be improved. All curbs will be painted.
Universitaria Av.	Rehabilitation of curbs, pavement and sidewalks. Some intersections will be substantially improved. All curbs will be painted.
Arequipa Av.	Rehabilitation of curbs, pavement and sidewalks. Some intersections will be improved. All curbs will be painted.
Tomas Valle Ave.	Most dangerous intersections will be improved

In some locations, existing earth sidewalks will be paved next to the bikeways, rather than leaving them unpaved which would entice pedestrians to use the bikeways. More islands for waiting bus passengers will be introduced between the bikeways and the road. Some additional spot improvements will be made to improve the public space at selected locations where a lot pedestrians (and potentially cyclists) congregate.

Some green areas will be laid out in the bikeways vicinity. The project will also include the construction of five so-called cycle-modules (see annex ciclomódulos), meeting spaces built along the bikeways, which will give the bikeway network a recognizable image and which will provide different services such as bathrooms, fast-foods, police assistance, small stores, bicycle repair shops, etc. The cycle-modules will be given without cost to selected concessionaires operating those businesses, and these concessionaires will be responsible for the maintenance of the cycle-modules and of the neighboring green areas.

In spite of a focus on poor areas (Northern Lima) and on work-related trips, the program will cover as well some better-off neighborhoods and leisure-related trips with the rehabilitation and extension of the Avenida Arequipa bikeway. The rationale beyond this is that from the broader view of sustainable transport in Lima, the promotion of bicycle use should target a more diverse range of populations and uses to bring about a cultural shift needed to further promote the use of bicycles in the urban environment. The opportunity provided by a linkage with the Avenida Arequipa will encourage middle-class users and tourists to use the bikeways as a viable option for reaching the city's historic center and ride to the beach. Rehabilitating Arequipa would have as well an effect on other middle-income comunas such as Barranco,

Surco, San Borja, and would help send the signal that bikes are not just for the poor. It additionally provides better linkages between neighborhoods of varying socioeconomic backgrounds.

GEF's incremental support has the potential to play a large role in maintaining political momentum which is also just beginning: for example, in Miraflores and San Isidro, two middle-income districts being served by Arequipa Avenue, bikeways were part of the electoral platforms of those eventually elected. The mayor of Miraflores has expressed his enthusiasm for NMT and the GEF project and said he would consider support for the project. Another factor that was taken into account to include Avenida Arequipa into the program was that counterpart funds from municipal districts such as middle-class Miraflores will be more substantial than from the Northern Lima municipal districts, since they are in a better financial situation.

### 1.2.2. Maintenance Plan Strategy

Proper maintenance is indispensable to the sustainability of this component and the project will finance the first year of maintenance during which municipalities will benefit from a hands-on training. This transitory one-year period will be used to seal agreements with the municipalities so that they commit themselves to continue to maintain the bikeways, provided that they are offered training and technical assistance regarding bikeway maintenance

### 1.2.3. Promotion Campaign

The Communication program will facilitate the relevant information for users, authorities and officials regarding the role of the different means of local transport in order to make Lima inhabitants aware of the benefits they can expect from riding a bike in terms of time and money savings. The message will be conveyed through universities, schools, media or civil society organizations such as the “Clubes de Madres”. In addition, the grant would also help tackling issues such as road safety, harassment of female users and maintenance of bicycles.

This promotion campaign includes several elements. The most important are listed below:

“sustainable mobility” program: as a result of an agreement with local businesses and factories, bicycle use will be promoted in coordination with local employers willing to provide their employees with some basic bike facilities such as guarded parking and, wherever possible, lockers and shower rooms.

An educational campaign through the media will disseminate information about the advantages of using bicycles and will aim at spurring a change of mentality in order to change bike use perception in the citizenry.

A number of promotional events that will generate and strengthen the population’s interest for bicycle use, such as races, mass bike-riding on Sundays, closing of some arteries to motorized transport in specific occasions like Bank holidays, etc. To the extent possible, those events will be patronized by local celebrities.

Safe-routes-to-school program: this component will try to encourage bicycle use as a mean of transport to schools, through the definition of NMT-friendly itineraries, building up on similar experiments carried out in North America and in Europe

Project “San Marcos is moving”: San Marcos University, located in the bikeways catchment area was identified as a very promising place to promote bicycle use. University management was consulted and agreed on facilitating bike use through installing bike parking facilities, promoting its use through internal campaigns, etc.

Project “Women and Transport”: different groups of women will be reached through schools, universities, civil society organizations, employers to disseminate a message adapted to women in order

to change the poor image of the bicycle and turn into a regular transport mode, that women can use as much as men do.

1.2.4. Restarting the 1994 Micro-Credit Scheme for Bicycle Acquisition (Plan Bici)

The 1994 scheme, designed to help low-income people to buy bicycles, was reasonably successful when it started and as long as the 1995-1996 promotion campaign on NMT was going on, but it later came to a standstill since the Caja Municipal, in charge of administering the funds, had no incentives to keep lending to the poor since transactions costs were too high due to the small size of the credit amounts, the stringent conditions to award the loans and their lack of direct connections with potential clients.

The current organization will be reformed to let private operators specialized in micro-credit participate;

Participating operators will have to have wide and strong relationships with grassroots organizations (clubes de madre, comedor popular);

Credit will also be provided to create bicycle-repair shops and will be available to anyone interested, regardless of his/her revenues, since the GEF project's ultimate is environmental and not poverty-focused;

The following table shows the new criteria that will be used for the program:

		<b>INITIAL OR CURRENT CRITERIA</b>	<b>PROPOSED CRITERIA</b>
1.	INTEREST RATES	Low interest rates	Interest rates levels ensuring the sustainability of the program (i.e. covering costs), freely determined by each operator.
2.	DIVISION OF WORK	The promotion and supply of credits are done by distinct agents	The credit providers will be responsible for both the promotion and supply of credit.
3.	LIQUIDITY REQUIREMENT	To high minimum liquidity balance required from operator, which ended up being an incentive no to lend.	Liquidity requirements will be limited to national and international standard levels.
4.	BIKEWAYS	Limited to the purchase of bicycles to be used in the areas of influence of the bikeways	Priority will be given to bicycles to be used in the areas of influence of the bikeways, but flexibility will be offered for other areas.
5.	FUNDS DISTRIBUTION	Management of the funds attributed without clear criteria.	The funds will be distributed to selected operators according to objective indicators (such as their prospective clientele or business plan).
6.	COST OF BIKES	The cost of a bicycle that can be financed must be less than US\$100.	The loan amount must be inferior to US\$150.
7.	PROMOTION	Sporadic promotion teams separated from the financial institution	Credit officers will be in charge of promotion.
8.	OPERATORS	Operators with minimum relationships with Social Base Organizations	Operators with wide and strong relationships with Social Base Organizations.
9.	INTERESTS USE	Interests capitalized in the credit fund.	A share of the interests will cover the operating costs, reserve funds and the operators' profits.
10.	MANAGERS OF THE PROGRAMS	No permanent professional team financed by the project	Permanent management team financed by the project.
11.	TARGET GROUP	Target Group: the poor and extreme poor (monthly income smaller than US\$200 and assets smaller than US\$5,000).	No limit on the level of revenues and family assets.

### ***1.3. Carry out an institutional strengthening program on sustainable transport***

This component will be targeting municipalities and institutions dealing with environmental issues and/or transport planning. It aims at incorporating climate change and environmental considerations into decision making processes, but will also strengthen the technical capacities of the municipal teams currently in charge of transport planning and that are stakeholders of the project. This institutional strengthening program, designed as an outcome of a diagnosis and capacity assessment exercise carried out jointly with the expected beneficiaries, aims at laying the groundwork for the success of the project and ensure it can be sustainable over time once those institutions will take over when the GEF project is closed.

The following institutions will benefit from the program : two provincial municipalities, Lima and Callo and seven municipal districts, Los Olivos, Independencia, San Martín de Porres, Comas, Rimac, Bellavista, Carmen de la Legua – Reynoso, along with FONAM which is the Project Implementation Unit.

The project would strengthen those institutions through three different types of activities:

**Awareness raising:** through workshops, classes, forums, the beneficiaries of the program will be exposed and involved in discussions and debates whose objective will be to raise their awareness vis-à-vis environmental issues related to transport, including climate change, so that air pollution, public and non-motorized transport move up in the municipal agendas. The target of those awareness raising activities goes beyond the municipal teams and will reach as well local communities and citizens so that the message could end up being as widespread as possible, in order to pave the way for future involvement of the citizenry in issues of transport planning. It will aim as well at reinforcing the bike promotion campaign and create a sense of ownership of the bikeways, so that they will be seen as a good belonging to the community and that has to be taken care of at the neighborhood level.

**Training programs and technical assistance:** to promote on-the-job training, consultants will accompany and advice during the project implementation timeframe municipal transport teams in their daily work and will help them resolve transport-related problems on the ground. The importance of this sub-component will decrease over time, but is expected to be quite important when the project starts as local capacities will still be insufficient to ensure a good start of the GEF project implementation. The scope of this technical assistance will cover as well overall specific studies necessary to the project success, but which are transversal to the municipalities and needed specifically in the context of the GEF project rather than on a regular and routine basis (such as the fine-tuning of the environmental guidelines for bus retirement to be included in the ToRs for the companies in charge of realizing it, or the redaction of templates for contracts between municipalities and civil works contractors or consultants).

**Capacity building:** Municipal teams, whose technical capacity is somewhat weak, will benefit from classes about the basics of transport planning (data collection, sample techniques, feasibility studies, environmental impact assessment, project monitoring, infrastructure maintenance, civil works supervision, etc...)

To end with, some basic equipments will be financed through the project in order to provide local municipalities with the core supplies and equipments necessary to carry out a decent job. It is worth mentioning here that some of those municipalities don't have computers or printers. The project will finance as well the equipments (uniforms and bikes) of the transit police staff which will be assigned to the bikeway surveillance.

#### ***1.4. Management, Monitoring and Evaluation and Replication Strategy***

The project includes a comprehensive monitoring and evaluation component based on qualitative and quantitative performance indicators for each of the sub-components. These indicators will include public transport and bicycle user surveys and impact assessments, public transport ridership data, road safety data, general traffic counts on trunk routes and bus counts on public transport routes given in concession.

The monitoring strategy for this project aims at tracking the changes towards the adoption of new transport patterns and behaviors. The methodology opted for is probably quite time-consuming and might require some more efforts than regular monitoring processes but the objective of the exercise is to provide the GEF with the necessary information it needs to decide whether expanding their support to similar sustainable transport measures is justified from a climate change perspective. Progress towards the project objectives will be measured on a regular basis through the following actions:

Design and validation of the monitoring system in cooperation with the implementing agency and all main stakeholders of the transport sector (municipal districts, DMTU, Direction of Non-Motorized Transport of the Metropolitan Municipality of Lima, provincial municipalities of Lima and Callao, NGOs in charge of project execution and the GEF project Consultative Committee).

Implementation of an automated data processing system

Monitoring of the implementation of the project, through project indicators that will result in monthly reports on project development progress, in comparison with the implementation plan, for each one of the components.

Monitoring through periodic surveys of the target population on a semester basis in order to measure permanently the market evolution and to estimate gradual increase in bicycle use, impacts and efficiency of the pilot projects to be implemented at the start of the bike use promotion campaign, rate of reinsertion in the labor market of those affected by the bus retirement component as a result of labor retraining or/and access to micro-credits, effective delivery of classes to institutions, etc.

Periodic surveys to measure the impacts of the communication and project advocacy actions on community leaders, members of the central and local governments, police authorities, university authorities, business world, etc.

Mid-term evaluation after two years of implementation to track behavioral changes that will have materialized, in order to try to identify the determinant factors that remove the barriers towards sustainable travel behaviors. This mid-term review will also evaluate to what extent people have become more aware of the direct link between transport and global/local contamination. This evaluation will then be used by the PIU to re-orient, if need be, the project implementation strategy.

Final evaluation / completion report that will measure the final results for each component and will estimate the degree of sustainability of the objectives achieved at closing date. The capacities acquired by government agencies and the traffic police, along with their degree of commitment to the objectives of the project will be assessed in order to identify potential weakness signals. The evaluation will conduct a final cost effectiveness analysis in relation to each component.

At that point, a very important factor to assess will be evaluation the change in perceptions, attitudes and behaviors within the different segments from the population vis-à-vis sustainable transport. This change will be measured against the results of the various focus groups carried out during the GEF project preparation phase. The final evaluation will be repeated two years after the project conclusion in order to examine sustainability and medium and long term impacts.



A replication strategy will be designed in the first half of the project implementation period and carried out in the second half. Mayors and technicians of secondary Peruvian cities will be invited to Lima for field visits and discussion with their Lima counterparts while seminars on sustainable transport will be organized in their cities, with the participation of stakeholders of the Lima project.

The Project Implementation Unit started to contact mayors all over Peru and actually traveled to several cities including Trujillo, Arequipa, Cuzco, Iquitos, Piura, Chiclayo, Huancayo, Pucallpa and Ferreñafe to launch discussions with mayors and their technical teams on sustainable transport and on how FONAM could help them in developing a sustainable transport strategy. The seminar held in Lima on September 16 and 17 was attended by several mayors of medium-sized cities in Peru and many members of technical municipal teams. In this opportunity, the Bank team initiated promising contacts José Murguía, mayor of Trujillo, Juan Carlos del Aguila, mayor of Maynas (Iquitos), Carlos Valencia, mayor of Cuzco, Juan José Salazar García, mayor of Ferreñafe. These mayors have been invited to define their needs in terms of technical support in the field of sustainable transport. FONAM will be in charge of centralizing the cities' requests to determine how the amount dedicated within the GEF project to replication activities (US\$ 125,000) can be best spent, the final objective being to examine the possibility of preparing a WB-IADB loan for these cities to follow up on the GEF-funded technical assistance with heavier investments programs. To end with, the funds which will be disbursed for the Credit Guarantee Fund and the micro-credits have to be returned to FONAM six months before project completion and, as a condition of disbursement for these components, FONAM has to commit to use those funds (up to US\$ 1,350,000) after project closing to finance activities in line with OP11, very probably in secondary cities in Peru.

