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BRAZIL

LOW CARBON URBAN MOBILITY FOR LARGE CITIES

(BR-G1006)

GRANT PROPOSAL

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   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709029
2. Monitoring & Evaluation Arrangements
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38708948
3. Procurement Plan
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38708953
4. Environmental and Social Analysis
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38708955

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1. Detailed Budget
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709279
2. Detailed Parallel Financing
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709267
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4. Components Description
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709270
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6. Terms of Reference
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709273
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8. Transport and Urban Mobility Sector Plan for the Mitigation of Climate Change (PSTM)
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9. Context and transportation description of the selected four cities
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38709280
10. The Energy and Environment Institute (IEMA) Background
    http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38941362
11. Global Environment Facility (GEF) Letter of Endorsement
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12. Safeguard and Screening form for Classification of Projects
    http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38951258

ABBREVIATIONS

A-S-I	Avoid-Shift-Improve
BRT	Bus Rapid Transit
CCS	Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy
CCL	Climate Change Law
CE	Ceará State
DF	Distrito Federal
EIRR	Economic Internal Rate of Return
ERE	Emissions Reduction Estimator
GEF	Global Environment Facility
GHG	Greenhouse Gases
GoB	Government of Brazil
IDB	Inter-American Development Bank
IEMA	Energy and Environment Institute (*Instituto de Energia e Meio Ambiente*)
ITS	Intelligent Transportation System
LAC	Latin America and Caribbean
MG	Minas Gerais State
MMP	Mobility Master Plan
M&E	Monitoring and Evaluation Plan
MOF	Municipality of Fortaleza
MoC	Ministry of Cities
NMT	Non-Motorized Transport
OEL	Optional Electronic Link
OMP	Operational Manual of the Project
PAC	Growth Acceleration Program
PCU	Project Coordination Unit
PEA	Project Executing Agency
PEP	Project Executing Plan
PEU	Project Execution Unit
PIR	Project Implementation Report
PMR	Project Monitoring Report
POD	Proposal for Operation Development
PSTM	Transport and Urban Mobility Sector Plan for the Mitigation of Climate Change
REL	Required Electronic Link
SEUMA/FOR	Secretariat of Urban Planning and Environment, Municipality of Fortaleza
SP	São Paulo State
SNTMU	National Secretariat of Transport and Urban Mobility
SOINF/BH	Secretariat of Works and Infrastructure, Municipality of Belo Horizonte
SETRANS/DF	Secretariat of Transportation, Federal District
SETRANS/SP	Secretariat of Transportation, Municipality of São Paulo
TDM	Transport Demand Management
TSF	Transport Sector Framework
UNFCC	UN Framework Convention on Climate Change

PROJECT SUMMARY

BRAZIL

LOW CARBON URBAN MOBILITY FOR LARGE CITIES

BR-G1006

Financial Terms and Conditions			
Beneficiaries: Federative Republic of Brazil, through the National Secretariat of Transport and Urban Mobility (SNTMU) of the Ministry of Cities (MoC); Municipality of Fortaleza, through the Secretariat of Urban Planning and Environment (SEUMA/FOR); Municipality of Belo Horizonte, through the Secretariat of Works and Infrastructure (SOINF/BH); Federal District, through the Secretariat of Transportation (SETRANS/DF); and Municipality of São Paulo, through the Secretariat of Transportation (SETRANS/SP). **Executing Agency:** Energy and Environment Institute (IEMA). Municipality of Fortaleza will act as the co-executing agency for the bike lane works set forth in Component 2.			
Source	**Amount US$**	**Disbursement period:**	42 months
IDB (GEF)	6,000,000	**Execution period:**	36 months
Parallel Financing*	147,130,637	**Currency of Approval**: US Dollars from Global Environment Facility (GEF)	
Total	153,130,637		

Project at a Glance
Project Objective/Description: The project's main objective is the development and implementation of sustainable mobility planning knowledge and technical tools aimed at the inclusion of climate change considerations in urban transportation projects in major cities, in order to contribute towards the achievement of Brazil's voluntary commitment of a reduction in Greenhouse Gases (GHG) emissions between 36.1% and 38.9% below business-as-usual levels by 2020. Specifically, the project will support the development and testing of sustainable transport design and GHG emissions assessment tools, the implementation of pilot projects, and training and dissemination activities targeting major Brazilian cities. Therefore, it is organized in three successive and integrated components: Component 1: Sustainable Urban Mobility Framework for Large Brazilian Cities; Component 2: Pilot Demonstrations; Component 3: Capacity Building and Dissemination.
Special contractual conditions prior to the first disbursement of the Bank's non-reimbursable financing resources: (i) the entry into effect of the Operational Manual of the Project (OMP), in accordance with the terms previously agreed upon with the Bank; (ii) the execution and entry into effect of the Cooperation Agreement between the SNTMU and the *Instituto de Energia e Meio Ambiente* (IEMA); (iii) the evidence of the establishment, within the organizational structure of SNTMU, of the Project Coordination Unit (PCU); and (iv) the evidence of the establishment, within the organizational structure of IEMA, of the Project Execution Unit (PEU) (¶3.5). **Execution special contractual conditions:** (i) the execution and entry into effect of a specific Cooperation Agreement between IEMA and Fortaleza Municipality will be a special contractual condition prior to the execution of any activity in that Municipality related to the bike path's design and execution financed by Subcomponent 2.3; and (ii) the entry into effect of cooperation agreements to be executed by IEMA and the Federal District, the Municipalities of Sao Paulo and Belo Horizonte, will be a special contractual condition prior to the execution of the activities of Component 2 in the cities of Brasilia, Sao Paulo and Belo Horizonte, respectively (¶3.6).
Exceptions to Bank policies: None.
Project qualifies for: SEQ ☐ PTI ☐ Sector ☐ Geographic ☐ HeadCount ☐

* In the context of this operation parallel financing (OEL#2) refers to financial and non-financial counterpart contributions being assigned by the Beneficiaries to the Project, for a total of US$147,130,637 from the following sources: (i) US$93,306,095 from contributions by MoC (hard loan and in-kind); (ii) US$4,761,904 from the Municipality of Fortaleza (in-kind); and (iii) US$49,062,638 from IDB loans and technical cooperation (1572/OC-BR; BR-L1333; ATN/OC-11468/10926/10693/12415- BR).

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problem addressed, and justification

1.1 Brazil's fast growing economy and consequent increase in motorization coupled with inefficient public transportation systems have led to a dramatic escalation of traffic congestion, air pollution, Greenhouse Gases (GHG) emissions and other negative externalities from automobile use in urban areas. The increased number of cars on the urban road network to the detriment of transit and non-motorized modes contribute to the deterioration of travel conditions for all users, especially in large and medium-sized cities. Brazil has some of the largest cities in the world; São Paulo is the world's seventh largest city, and 24 other cities have more than 700 thousand inhabitants, encompassing 25% of the country's population.[1]

1.2 Brazil's vehicle fleet, including automobiles, motorcycles, light commercial vehicles and buses reached 38 million in 2013.[2] Only in São Paulo State (SP), more than 2,000 new cars are added every day.[3] At the same time, in São Paulo city, total trips using private vehicles have increased 21% from 2007 to 2012;[4] this trend is more worrying since the private fleet increase happened mainly among the low and medium-low income population. This population, living in the outskirts, replaced the use of public buses (which increased its demand only 8% in the same period) with private cars and motorcycles for their daily transport needs.

1.3 Estimates show that economic losses from traffic congestion only in São Paulo reach more than 40 billion dollars a year.[5] A marked shift from private cars to public transit and non-motorized modes is required. But achieving such a shift is difficult; alternatives to private vehicles need to be competitive and attractive in order to encourage changes in mode choice.

1.4 Rapidly increasing motorization is intensifying GHG emissions and, measured by final energy consumption, the transport sector was responsible for 44% of the CO_2 emissions,[6] being the single largest producer of CO_2 in the country. The Transport and Urban Mobility Sector Plan for the Mitigation of Climate Change (PSTM) (OEL#9), estimated that CO_2 emissions from the passenger transportation sector will reach 150 million of tons in 2020,[7] representing an increase of 65.9% compared to base year 2010, therefore making it imperative to take decisive actions to limit GHG emissions from this sector.

1.5 The Government of Brazil (GoB) launched in 2007 a major investment plan: the Growth Acceleration Program ("*Programa de Aceleração do Crescimento*", or PAC). The PAC - FIFA World Cup Urban Mobility Program ("*Investimentos em*

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[1] IBGE, 2013 - http://www.ibge.gov.br/home/estatistica/populacao/estimativa2013/estimativa_dou.shtm
[2] SINDIPEÇAS, 2013 - http://www.sindipecas.org.br/arquivos/RFCB2013.pdf.
[3] BAZANI A. 2014 - http://www.antp.org.br/website/noticias/ponto-de-vista.
[4] LEITE, M; GERAQUE, E; ROSATI, C. 2014 - http://www1.folha.uol.com.br/fsp/cotidiano/155907-viagens-individuais-crescem-mais-que-em-transporte-coletivo.shtml
[5] CINTRA, M. 2013 - http://rae.fgv.br/sites/rae.fgv.br/files/artigos/gv_v12n2_58-61.pdf.
[6] Brazilian Inventory of Anthropogenic Emissions and Removals of Greenhouse Gases (GHG), 2005. Ministry of Science and Technology, 2010 - http://www.mct.gov.br/upd_blob/0214/214061.pdf.
[7] In this scenario, individual transport will be responsible for 67% of passenger transportation CO_2 emissions and public transportation will total 33%.

Mobilidade Urbana para a Copa de 2014") aimed to support the 12 FIFA World Cup host cities in the improvement of their mass transit systems. The project has a US$5.7 billion (R$12 billion) lending budget to finance the infrastructure of the 12 selected mass transit projects in the World Cup host cities.

1.6 The GoB also launched in 2011 the PAC - Urban Mobility in Large Cities (PAC-UM), with a total cost of US$15.2 billion that will benefit the 24 largest cities (those with over 700,000 inhabitants), which are home to about 50.6 million people or 25% of the population. These projects will improve public transportation, benefitting 39% of metropolitan dwellers. The projects include all transportation systems, such as BRT, light rail, commuter trains, and metro. The Ministry of Cities (MoC) is responsible for the coordination, approval, monitoring and evaluation of all financed urban transportation systems by PAC-UM.

1.7 Nevertheless, PAC-UM projects only include the financing of their infrastructure, which are rarely articulated with any sustainable mobility strategy that includes complementary measures and considerations of climate change mitigation and adaptation issues. Therefore, the PAC-UM does not include measures such as those designed under the paradigm Avoid-Shift-Improve (A-S-I)[8; 9] or any criteria to increase the resiliency of transportation systems. Furthermore, sustainable urban transport indicators and the assessment of GHG emissions reductions from the PAC financed infrastructure are currently not part of the MoC's evaluation requirement for considering municipalities' investment proposals.

1.8 The GoB is committed to reversing this situation, through the promotion of sustainable transport, and addressing the challenges presented by climate change. In 2001, launched the "*Estatuto da Cidade*", Federal Law 10,257 establishing that all cities with more than 500.000 inhabitants should develop a Mobility Master Plan (MMP). This requirement was later scaled up by Law 12.587/2012, National Urban Mobility Policy, which aims at the integration of different transport modes, with emphasis in mass transit, and the improvement of people and freight mobility and accessibility. Municipalities with over 20,000 inhabitants are also required to elaborate MMPs. However, most cities in Brazil do not have such a plan due to financial and technical limitations and lack this framing document to guide project identification, selection and implementation.

1.9 During the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), Brazil expressed the decision to contribute to an ambitious international effort to combat climate change. In December 2009, the GoB launched the Brazilian Climate Change Law (CCL) that provides the principles, objectives, guidelines and implementation mechanisms for climate change public policies. The law creates a supportive environment for

[8] Avoiding: the need for unnecessary motorized trips through smarter land use and logistics planning; Shifting: the transport of goods and persons to the most efficient mode; and Improving: the efficiency and environmental performance of transport systems by improved vehicle, fuel, and network operations and management technologies.

[9] According to a 2012 International Energy Agency report, "*Global Land Transport Infrastructure Requirements*", the global adoption of A-S-I based policies in the transport sector would realize a US$30 trillion in savings in vehicle and fuel expenditures and a US$20 trillion in infrastructure savings giving a net savings of US$50 trillion. Moreover, by just considering fuel savings, cumulative CO_2 emissions reduction would exceed 130 Gt CO_2 over the 40-year period from 2011 to 2050.

Federal, State and Local Governments actions on climate change. In this context, the GoB has established a national voluntary commitment of reducing Brazil's GHG emissions by 36.1% to 38.9% by 2020, compared to a business as usual scenario.[10] Under the CCL, the GoB developed the PSTM,[11] which is part of the GoB's strategy for mitigation and adaptation to climate change. It defines measures to contribute towards the CCL's goal, both for freight transport and urban mobility. On the latter, the PSTM has been developed in consonance with current PAC investment programs (i.e., PAC-UM, PAC-World Cup) as well as at state and local levels, and it promotes measures to increase urban mobility and accessibility and to improve mass transit, thus contributing to emissions reductions.

1.10 Despite GoB's clear commitment towards sustainable mobility and accessibility and dealing with the challenges posed by climate change, shortcomings are also evident. Insufficient training, lack of appropriate tools and adequate information at the national and municipal levels is a massive barrier to achieving sustainable urban transport systems in Brazilian cities, which promote public transit and Non-Motorized Transport (NMT) and discourage automobile use. Few cities have the technical, institutional and operational conditions necessary to develop comprehensive plans and projects, as demonstrated by the lack of MMPs. Furthermore, there is also a lack of knowledge, technical capacity and methodologies for assessing and monitoring GHG emissions, and for the evaluation of climate changes issues on urban transport. This situation renders inefficient any effort to direct urban transport investments towards the achievement of the CCL's goal.

1.11 **Project strategy.** Investments in mass transit facilities and services that increase access and quality of life while also cutting carbon emissions would benefit large cities in Brazil and around the world. Mass transit, pedestrian and bicycle facilities, improved traffic management, and coordinated transport and land use are important low-carbon access and mobility strategies.[12] Most cities should also gain by strategically coordinating transport investments, creating networks of mass transit systems operating on traffic-managed streets conveniently reached by bikeways and pedestrian ways and serving mixed-use neighborhood and commercial district centers. In addition, most cities could benefit from pricing policies for parking, and other transport services that better reflects marginal social and economic costs of private cars. A study of the benefits of adopting an

[10] According to Brazil's second National Communication to the UNFCCC (2010), road transport is the largest contributor to the country's carbon dioxide emissions from energy sector (39% in 2005).

[11] The current version of PSTM was recently submitted for public consultation and will be valid from its enactment date to 2020, with regular reviews every two years.

[12] The Insurgente Corridor – Metrobus BRT project in Mexico City, ME cut CO_2 emissions by about 10% or 50,000 tons/year. In Santiago de Chile, a survey to evaluate the 200 km bike path's impact showed that slightly under one-third of all bike trips would not have been made without the cycle paths: an analysis of CO_2 saved, fuel saved, travel time and accidents reduced showed a total annual project value of about US$628,000 (Center for Global Metropolitan Studies, University of California, Berkeley, *Considering Climate Changes in Latin America and Caribbean Urban Transportation: Concepts, Application and Cases*, June 2009).

urban mobility and investment plan in Belo Horizonte, Brazil[13] showed that by 2030 the integral mobility compared to the baseline scenario should achieve cumulative savings of 9 million tons of CO_2 eq. and 182 million hours of public transport and 170 million hours for private vehicle on travel times equivalent to nearly US$1,300 million and reduced travel costs of US$900 million.

1.12 This project aims at creating enabling planning and technical frameworks that will make it possible to systematically assess investments in urban transport in large cities and promote the adoption of more formal and scientifically based sustainable transport measures and practices, as described above. It was conceived to address the lack of standardization regarding the conception of low carbon transportation projects and the methodologies for evaluating them as a requirement for receiving technical and financial support from the federal level, and to monitor the related emissions for promoting sustainable urban mobility.

1.13 The project will benefit the GoB by increasing its capacity to consider climate change and sustainable urban mobility on its policies and actions, through knowledge improvement and the development of technical guidance and procedures that include environmental issues and GHG emissions reductions. Pilot projects will benefit several cities: Fortaleza, Ceará State (CE), Belo Horizonte-Minas Gerais State (MG), Brasília, Federal District (DF), and São Paulo, SP. In addition to these, it has also been considered that the remaining twenty cities that are part of the Large Cities Mobility PAC will benefit indirectly from the project through capacity building and dissemination activities developed within the Project. These cities can be considered indirect beneficiaries, as the knowledge and tools that will be developed will be made available through guidelines on how to assess, plan, and implement projects and measures to promote low-carbon transport, as well as training activities.

1.14 **IDB's climate change strategy.** The project is consistent with the objectives of the "IDB Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy" (CCS) (GN-2609-1), which guides the scaling-up support for climate change mitigation and adaptation activities in Latin America and Caribbean Region (LAC). The project supports the following priorities: (i) strengthening institutions and private and public sector capacities; and (ii) developing instruments to mainstream climate change mitigation and increase resilience in Bank-funded operations.

1.15 **IDB's country strategy.** The project is also consistent with the Bank's Country Strategy with Brazil for 2012-2014 (GN-2662-1) in the following objectives: (i) stimulate social and productive inclusion; (ii) improve country's infrastructure; (iii) promote the development of sustainable cities; (iv) improve institutional capacity of public entities; and (v) increase the sustainable management of natural resources and climate change mitigation and adaptation actions. The Strategy also proposes to act in support of all federal initiatives included in the PAC, giving

[13] EMBARQ, *Scoping Post 2012 Climate Instruments: Nationally Appropriate Mitigation Actions Case Study for Opportunities in Urban Transport in Brazilian Cities*, April 2010. Includes roadway improvements, BRT, metro expansion, mass transit integration, bicycle paths and pedestrian facilities, and land use and parking policies.

priority to: (i) mass transit, through the operational streamlining of services, improvement and implementation of bus corridors, and expansion of transportation capacity; (ii) NMT, with actions to improve infrastructure for pedestrians, persons with special needs, and cyclists; and (iii) sustainable mobility, to promote the use of less polluting transportation modes and cleaner technologies.

1.16 The project contributes to: (i) the development of better urban transport plans and projects that will increase the population's mobility and accessibility; (ii) the development of more efficient public transport, based on international best practices and including high environmental standards; (iii) the promotion of NMT and universal accessibility, through the implementation of bicycle facilities the improvement of pedestrian infrastructure and the adoption of universal accessibility standards; (iv) the development of design criteria and evaluation tools for the implementation of less polluting transportation systems; and (v) the development of capacity at the national and local levels for better planning and design of urban mobility systems. The project outcome is expected to contribute to the following objectives of the Country Strategy Results Matrix: (i) support large and medium-sized Brazilian cities in improving urban transportation; and (ii) support national and subnational governments at the state and municipal levels in implementing the National Climate Change Plan (PNMC) and its sector plans.

1.17 **Alignment with the IDB's Ninth General Capital Increase (GCI-9).** The project will contribute to the lending program priority of the Ninth General Increase in the Resources of the Inter-American Development Bank (AB-2764) (GCI-9) "Lending to support climate change initiatives, renewable energy and environmental sustainability" and to associated regional development goals, by improving the efficiency of public transport, which will increase the quantity of people who have access to better low-carbon public transport systems, thus reducing related energy consumption and carbon emissions, while increasing the country's planning capacity in mitigation and adaptation of climate change.

1.18 **Transport Sector Framework (TSF).** The project is consistent with the guidelines of the TSF, which seeks to promote transport systems that are accessible, efficient, inclusive, sustainable and safe, contributing to reduced poverty, improved living conditions and economic development. Furthermore, the Project follows the Transport Division's strategic areas: (i) Sustainable Transport; (ii) Road Safety; and (iii) Intelligent Transportation Systems (ITS).

1.19 **Collaboration between the Bank's divisions.** Due to the complexity of proposed interventions, the project was designed by the Transport Division (INE/TSP) in collaboration with the Climate Change and Sustainability Division (INE/CCS).

1.20 **Bank's participation.** The Bank has been supporting the development of sustainable mobility in Brazil through multiple technical cooperation grants and investment loans, including: (i) IIRSA Strategic Plan Sustainable Development of the Rio de Janeiro Metropolitan Bypass (ATN/OC-10693- BR), US$1.02 million; (ii) Rio de Janeiro Metropolitan Express BRT Corridor Structuring (ATN/OC-10926-BR), US$1.50 million; (iii) Rio de Janeiro State NMT Program

(ATN/OC-11468-BR), US$0.48 million; (iv) Support to Sustainable Urban Mobility in Joao Pessoa City (ATN/OC-12415- BR), US$0.40 million; (v) Fortaleza Urban Transport (1572/OC-BR), US$85.20 million; and (vi) Fortaleza Urban Transportation Program II (BR-L1333, in preparation), US$57.91 million.[14] These projects not only are part of parallel funding for this Project (¶1.37; ¶3.5) but will also provide input data for the development of the components of this Project, and the projects in Fortaleza will also serve as pilots to test the products of this Project (¶1.37; ¶3.5).

B. Objectives, components and costs

1.21 **Objectives.** The project's main objective is the development and implementation of sustainable mobility planning knowledge and technical tools aimed at the inclusion of climate change considerations in urban transportation projects in major cities, in order to contribute towards the achievement of Brazil's voluntary commitment of a reduction in GHG emissions between 36.1% and 38.9% below business-as-usual levels by 2020. Specifically, the project will support the development and testing of sustainable transport design and GHG emissions assessment tools, the implementation of pilot projects, and training and dissemination activities targeting major Brazilian cities. Global Environment Facility (GEF) funding will be applied to the three components described in the OEL#5 and presented below.

1.22 **Component 1. Sustainable Urban Mobility Framework for Large Brazilian Cities (US$1,076,330).** This component will provide a framework and guidelines to support GHG emissions reductions and the inclusion of climate change adaptation criteria in urban transport projects. It will approach urban mobility issues in general by dealing with concepts revolving NMT, Transport Demand Management (TDM), priority measures for public transport, ITS, best practices in urban mobility, and the estimation and evaluation of GHGs emissions from urban mobility. Proposed activities will be used to enhance federal and municipal governments' capabilities to implement new public policies for GHG reductions in urban mobility, and will better equip the MoC to exert its influence over municipal urban transportation policies and projects. The supervision of activities within the component is also included.

1.23 This project will develop a draft regulatory framework that requires the inclusion of standardized methodologies, indicators and procedures developed within it to estimate emission reductions as a set of GoB's requirement for future investments on new urban transportation projects. This framework will seek to promote the effective integration of public and non-motorized transportation systems.

1.24 Along with the framework, six guidelines will be produced as technical references for consideration of GHG and local pollutant emission, which will support program design and evaluation in urban transportation agencies throughout the

[14] Other Bank operations currently in execution include: Sao Bernardo do Campo Urban Transportation Program II (2888/OC-BR), US$125 million; Blumenau's Sustainable Urban Mobility Program (2746/OC-BR), US$59 million; São Paulo Metro Line 5 Extension Project (2305/OC-BR),US$481 million; Urban Transportation Program for the Federal District (1957/OC-BR), US$177 million.

country. Two existing guidelines will be reviewed and four new guidelines will be developed. These guidelines will cover: (i) NMT; (ii) TDM; (iii) priority measures for public transit; (iv) ITS; (v) urban mobility best practices; and (vi) estimation and evaluation of GHGs emissions from urban mobility. Climate change mitigation and adaptation and GHG reductions will be the guideline's main backbone.

1.25 The component will provide technical assistance to MoC by contracting experts to provide training on how to apply the guidelines, thus strengthening MoC's capacity to provide technological backstopping to municipalities around the country. Furthermore, the state-of-the art on climate change adaptation guidelines will provide the foundation for the development of climate change adaptation criteria for urban transport projects.

1.26 **Component 2. Pilot demonstration projects (US$3,955,809).** This component will encompass: (i) the development of a tool to evaluate emission reduction potentials for new urban transportation projects; (ii) the development of NMT and TDM pilot strategies; and (iii) the implementation of a pilot for improving public transportation and NMT standards. These pilot projects will not only produce direct benefits but will provide feedback on the implementation of the emissions evaluation tool, and the framework and guidelines developed under Component 1, in order to enhance the quality of those products.

1.27 The first subcomponent will include four products: (i) the development of an Emissions Reduction Estimator (ERE), a user-friendly tool (system) to evaluate future projects that will help the MoC in the assessment of applications for federal funding; (ii) an interface to enhance the monitoring of GHG and local pollutants of transportation projects; (iii) a methodology for ex post evaluation of transportation projects; and (iv) and the application of the methodology for ex post evaluation of transportation projects on pilot projects.

1.28 The ERE will estimate emissions reductions resulting from modal shifts, and will be calibrated through modal shift parameters from existing transport models. Four pilot cities (Belo Horizonte, Brasilia, Fortaleza and São Paulo) were selected[15] to provide parameters related to modal shifts and GHG and local pollutants emission reductions. Recently, all four cities have updated their transport models, which will provide the data for the estimation of required parameters. The ERE will be developed to trace correlations between project parameters and associated modal shifts and emission reductions based on the cities' multi modal models. Once calibrated, the tool will perform quick estimates of emission reductions for urban transport projects, based on their characteristics and a database of simulated scenarios of transport projects in large Brazilian cities.

[15] The MoC was responsible for the selection of four cities to participate in the Project, according to the following selection criteria: number of PAC project financed by the GoB; impact of the PAC project in the transport network; status of the PAC project; quality and quantity of information available; impact of the project in other cities; participation of the society in the project; interest and commitment of the local government; local technical resources available; existence of cycle lanes network; existence of cycle lanes strategic plans. The cities selected were Belo Horizonte, Brasilia, Fortaleza, and São Paulo and a brief of each city is presented in the (OEL#10).

1.29 Along with the ERE, an interface will be developed to display and monitor transportation sector data of future projects. This interface will be able to compile the data related to transportation projects in order to generate reports that give an overview of the country's infrastructure development and resulting emissions reductions. The tool will help to monitor how Brazil is going to reach the goals established under the national voluntary commitment.

1.30 The ex post methodology to evaluate modal shift impact of transportation projects will address issues regarding modal shift, performance and quality of transportation systems considering users opinions, and physical and operational characteristics. Collected data will enhance the ERE and its interface. The methodology will be applied in the pilot cities to calibrate the ERE parameters.

1.31 The second subcomponent will include the development of: (i) a TDM Strategic Plan; and (ii) a NMT Strategic Plan. These plans are a preliminary step that establishes political directives and qualitative goals to guide the municipality to develop an urban mobility plan that can be a reference for other Brazilian cities. These strategies will provide feedback for the guidelines and will serve as models for other cities, multiplying the effect of the intervention. They will identify ways and appropriate infrastructure elements needed to enable NMT and its integration with public transportation networks, and to efficiently manage transport demand.

1.32 The TDM strategy study will be conducted in Belo Horizonte, which has a road network that has been continually improved for many decades and a traffic control system designed to support TDM implementation, and has already applied some traffic calming and parking policies. However, as traffic congestion continues to be a costly problem, the city has been considering the implementation of TDM measures like congestion charging or license schemes. The TDM study will involve the review of the existing mobility plan, the assessment of traffic conditions, and the evaluation of the feasibility of TDM measures such as license schemes, congestion charging, parking policies and traffic calming.

1.33 The NMT strategy study will be conducted in Brasilia, which was planned and designed in a time when the idea of the car being a perfect transportation mode for the modern life was paramount. However, times have changed as transit and NMT are taking important roles in the solutions to mobility problems, and Brasilia is no exception. The city has already designed a network that includes 600km of bikeways, but still has no associated NMT plans. The NMT study will involve the review of current pedestrian and bikeway directives, data collection, the assessment of NMT infrastructure, and the design of strategic NMT measures.

1.34 The third subcomponent will include the implementation of a pilot NMT project within the context of the larger program financed through Parallel Financing, which comprises two BRT corridors[16] in Fortaleza partially financed by the Bank. The City will implement measures aimed at improving public transportation and NMT standards on these corridors, which will include operational, technology and

[16] Corridor 1: Antônio Bezerra/Centro/Papicu (1572/OC-BR); Corridor 4: BR116/Aguanambi (BR-L1333).

accessibility improvements over the PAC financed projects[17] in terms of overall performance and GHG emissions reduction. More specifically, the NMT pilot project will consist of a high standard new bike lane (7 km) to be financed by this GEF project, to measure shift mode on site. This IDB/GEF bicycle infrastructure project will be integrated to one of the IDB BRT corridors and will include top features (functionality, transit integration, network planning, etc.), and will serve as a model for bicycle infrastructure development in other municipalities.

1.35 **Component 3. Capacity Building and Dissemination (US$610,431).** This component will strengthen the capacity of government officials and relevant stakeholders at local levels, including but not limited to the twenty cities that are part of the Large Cities Mobility PAC, on sustainability practices for urban mobility and GHG emissions assessment and monitoring. These capacity building activities will be an initial step to support the institutions involved in the implementation of urban mobility policies and projects to be able to incorporate the climate change considerations that will be required by the new directives established by the MoC through the proposed planning and technical framework. The supervision of activities within the component is also included.

1.36 This component will include: (i) three workshops for government officials and relevant stakeholders at national and local level on urban transport emissions assessment and monitoring, covering the fundamentals on transportation related emissions, multi modal modelling and emissions estimation, and ex post evaluation of transportation projects; (ii) five workshops on Sustainable Urban Mobility, covering NMT, TDM, Priority Measures for Public Transit, ITS, and Best Practices on Urban Mobility; (iii) the publication of the technical guidelines developed in Component 1; and (iv) two dissemination seminars, one at the beginning of the project in order to engage relevant stakeholders, and one at the end aimed at sharing project results and produced knowledge.

1.37 **Project costs.** The total cost is US$153,130,637; US$6,000,000 is to be financed by the IDB/GEF; and US$147,130,637 from parallel financing from the following sources: (i) US$93,306,095 from contributions by MoC (hard loan and in-kind);

Table 1: Project costs and parallel financing (US$)

Component	IDB/GEF	Parallel financing			Total
		National Government	Fortaleza Local Government*	IDB Loan/ TCs**	
1. Sustainable Urban Mobility Framework for Brazilian Large Cities	1,076,330	800,000	0	0	1,876,330
2. Pilot Demonstrations	3,955,809	91,047,619	4,761,904	49,062,638	148,827,970
3. Capacity Building and Dissemination	610,431	1,458,476	0	0	2,068,907
4. Project Administration and Auditing	357,430		0	0	357,430
Total	**6,000,000**	**93,306,095**	**4,761,904**	**49,062,638**	**153,130,637**
		147,130,637			

*****In-kind contribution for Fortaleza project ****** 1572/OC-BR; BR-L1333; ATN/OC-11468/10926/10693/12415- BR.

[17] BRT Corridor 6: Jucelino Kubitschek/Alberto Craveiro; and LRT Parangaba/Mucuripe Corridor.

and (ii) US$4,761,904 from the Municipality of Fortaleza (in-kind); and (iii) US$49,062,638 from an IDB Loans (1572/OC-BR; BR-L1333) and technical cooperation (ATN/OC-11468/10926/10693/12415-BR) (OEL#1).

C. Key results indicators

1.38 The main expected outcomes of the project presented in the Annex II are reductions of GHG emissions from urban transport related to: (i) the inclusion of improvements over the PAC projects' standards, particularly focused on NMT (pedestrian and bicycle) integration and universal accessibility, on two IDB's BRT corridors in Fortaleza; (ii) the implementation of the model bicycle infrastructure project in Fortaleza; (iii) the implementation of pilot projects in Brasilia and Belo Horizonte; and (iv) the implementation of the framework and guidelines in the development of future urban transportation projects to be undertaken by Brazilian cities, considering modal shifts to public transport and NMT. Furthermore, it is expected that the impact of the project will be a contribution towards the achievement of Brazil's voluntary commitment of a reduction in GHG emissions between 36.1% and 38.9% by 2020. The estimation of Initial Emissions Reductions is detailed in the OEL#6.

1.39 Outcome and output indicators and means of verification will optimize the use of information collected during the execution of this project. All the output indicators will be measured directly. Outcome indicators will be estimated according to the methodologies defined in the Monitoring and Evaluation Plan (REL#3). These measures and estimates will be compared with the expected outputs and outcomes presented in the Results Framework (Annex II).

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

2.1 This project is structured as a US$6 million non-reimbursable investment grant from the GEF, which will be managed by IDB as a GEF Executing Agency and a parallel financing of US$147.130.638,23 (OEL# 2) that will be provided by: (i) GoB: US$1.068.000 (about R$2.24 million) in kind and US$92,238,095 (about R$193.7 million) in hard loans for the construction of PAC - Urban mobility projects in Fortaleza city, which have been formally committed;[18] (ii) local government: US$4,761,904 in-kind, from Fortaleza municipality;[19] and (iii) IDB operations: US$45,665,638 loan financing for improvements over PAC projects' standards and US$3,397,000 technical cooperation grants to develop urban mobility strategies and projects.[20]

2.2 **Disbursement schedule.** The disbursement period will be 42 months from the date of signature of the Non-Reimbursable Financing Agreement between IDB and IEMA.

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[18] GEF policies request confirmation of Government's contribution through a signed co-financing letter (OEL#8).

[19] Additionally, these municipalities will contribute with budgetary resources in the total amount of US$353.7 million (R$742.87 million) as local counterpart of PAC - Urban Mobility Projects and US$848,000 as in-kind counterpart of IDB's non-reimbursable technical cooperation.

[20] BR0302; BR-L1333; ATN/OC-11468/10926/10693/12415 – BR.

Table 2: Disbursements

Source	Year 1	Year 2	Year 3	Year 4	Total
IDB/GEF	**1,076,030**	**2,692,036**	**1,634,855**	**597,079**	**6,000,000**
%	17.9%	44.9%	27.3%	9.9%	100.00%

B. Environmental and social risks

2.3 The project is expected to have direct and indirect positive environmental and social impacts. The direct positive impacts will be the emissions reductions and increased accessibility and mobility from the improvements to BRT corridors and the implementation of bicycle infrastructure, while indirect positive impacts are expected from the application on future projects of the knowledge and tools developed by the project.

2.4 However, minor and temporary negative impacts could be expected from the implementation of bicycle infrastructure financed by Component 2. These impacts will be localized and of short duration, during the construction phase, and are related to the generation of dust and construction waste materials, and interference with traffic. Environmental and social mitigation measures will be applied during the construction stage, as presented in REL#5.

2.5 The project has been classified as Category B, pursuant to the IDB's Environment and Safeguards Compliance Policy (OP-703).

C. Fiduciary risk

2.6 As part of the design of the operation, the team project made an evaluation of the institutional capacity of the Project Executing Agency – Energy and Environment Institute (IEMA) and conclude that the IEMA has large experience in the execution and management of grants and contracts, specifically through: (i) supporting and monitoring technical and legal requirements of funding bodies; (ii) coordinating the acquisition of goods and services; and (iii) accounting and financial management and accountability of funds from funding bodies. Also, the IEMA has internal rules and procedures as needed and an information system that meets the Bank's requirements for execution and control, as well as an adequate internal control system in place (Annex III).

D. Other key issues and risks

2.7 **Risk assessment**. During project preparation, a risk assessment was undertaken and a risk mitigation plan defined (REL#6). Identified risks include: (i) lack of communication among participating agencies; (ii) low commitment of the MoC; and (iii) low commitment of the Municipalities. Proposed mitigation measures include effective inter-institutional arrangements between the parts (¶3.5), maintaining clear and regular communication, the assignment of a dedicated team within the MoC responsible for reviewing and supervising all the project's products, the design of the organizational arrangements for the future enforcement of the framework and the methodologies as the technical requirement for decisions on urban transportation projects financing, and officially committing the cities with the project, while also exposing potential benefits of the project for the four host cities population and publicizing the results of pilot demonstrations.

2.8 **Economic evaluation.** A cost-benefit analysis (OEL#3a) was carried out for this project considering the additional benefits that would be attained through the proposed activities, over those benefits that would result from the associated financing alone. The evaluation quantified: (i) indirect benefits in terms of the monetary value of potential emissions reductions over a 10-year period that would result from the implementation, in the four pilot cities, of frameworks, guidelines and strategies developed by the project; and (ii) costs in terms of direct project investments. The economic costs and benefits discounted at a rate of 12% have resulted in a Net Present Value (NPV) of R$16.6 million. In addition, the project has an Economic Internal Rate of Return (EIRR) of 38,55%. Several sensitivity analyses were carried out, all of them yielding positive results.[21]

Table 3: Cost-Benefit and Sensibility Analyses

Indicator	Baseline	25% benefits reduction	25%costs increase	15% benefits reduction + 15% costs increase
EIRR (%)	38.55	31.9	30.2	29.8
NPV (R$)	16.596.780	10.313.090	14.462.290	11.545.870

2.9 **Project sustainability.** The GoB's commitment towards sustainable mobility and accessibility (¶1.8) is the foundation for the sustainability of the implementation of the framework and the methodologies developed by this project as decision making tools for urban transportation projects financing. Furthermore, these tools will not only define new standards and require the estimation of emissions reductions for projects nationwide, but will also facilitate the MoC's evaluation of funding applications, contributing to the earlier execution of investments required to achieve national and local level development and environmental goals.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

3.1 **Project Executing Agency (PEA).** The PEA of the project will be the IEMA, a non-profitable organization, duly incorporated in accordance with Brazilian laws, working for the formulation, implementation and evaluation of public policies of urban mobility, improvement of air quality and reduction of GHG emissions. The IEMA[22] has a considerable experience in executing projects financed by different donors, such as William and Flora Hewlett Foundation and Climate Works

[21] Benefits considered in this evaluation are only referred to incremental emissions reductions from the implementation of the Project and its impact on the efficiency of mass transit investments. Individual investment projects, with or without Project-related improvements, will be economically viable based on reductions in travel times, operation costs and accidents. Such is the case of Corridor 4 in Fortaleza (OEL#3b), which shows an EIRR of 24.3% when considering the total investment cost (including improvements) and related travel times, operation costs and accidents benefits; and it shows an EIRR of 23.7% when adding the full cost of this project to the corridor's investment cost (though it should be prorated for multiple projects in at least 4 cities) and considering the improvements-related reductions of emissions of corridor 4.

[22] Founded by William and Flora Hewlett Foundation in 2006, the Instituto de Energia e Meio Ambiente (IEMA) is a non-profitable organization focus on social environment problem solution around the world. The Institute is part of a worldwide network in many countries and it is presented in Mexico, Europa, India and China. The IEMA has been involved in many projects formulating, implementing and evaluating public policies of urban mobility to improve air quality and reduction of (GHG) emissions. The Institute is part of the Climate Works an international philanthropic network dedicated to achieving low-carbon prosperity and in the Cadastro Nacional de Entidades Ambientalistas (CNEA) a national database managed by Ministry of Environment in Brazil.

Foundation. It is specialized in the management of investment grant projects, specifically through: (i) compliance with donors' technical and legal requirements; (ii) procurement of goods and services; and (iii) accounting and financial management and accountability of funds granted by donors (OEL#11).

3.2 The choosing of IEMA as the PEA was explicitly established by the MoC in its letter of request ("*Carta consulta*") and approved by the Secretariat of International Affairs/Ministry of Planning, Budget and Management in its Letter of Endorsement 42 SEAIN/MT (27/AUG/2012). In addition, the IEMA has ample experience in working with governmental organizations in big metropolitan areas; in particular it supported the MoC on the development of the PSTM. Risks associated to the IEMA's execution capacity were evaluated as low (OEL#4).

3.3 The IEMA will be responsible for the technical, financial and fiduciary execution and administration of the Project, including among others: (i) developing the Project's Executing Plan (PEP) and corresponding Annual Operational Plans (POAs) (REL#2), Acquisition Plan (PA) (REL#4)) and Project Implementation Reports (PIRs) to be presented semi-annually to the Bank and GEF; (ii) establishing the scope, developing Terms of Reference (TORs) and/or technical specifications for consultancy services, and goods to be financed by the Project; (iii) preparing bidding documents and executing all procurement activities for goods and services financed by the project according to Annex III and ensuring their effectiveness; (iv) executing technical supervision in coordination with the Beneficiaries in order to ensure the quality of goods and services provided by contractors and vendors; (v) opening a bank account for the exclusive administration of IDB/GEF resources; (vi) maintaining accounting and financial records of the sources and uses of Project's financial resources and submitting supporting documentation of expenses, (vii) ensuring compliance with Bank's policies and the provisions of the Non-Reimbursable Financing Agreement to be executed between the Bank and IEMA; and (viii) preparing the Project's financial progress reports, audited financial statements and disbursement requests; and (ix) monitoring and evaluating project implementation.

3.4 The IEMA will create a Project Execution Unit (PEU) and will allocate all necessary human and technical resources needed for project execution. In addition, the IEMA will use its systems capacity for integrated procurement, financial administration and reporting, as well as project management and monitoring systems, while ensuring their compatibility with Bank's policies, procedures and control and reporting systems. The IEMA will designate a project leader and will allocate the additional technical and administrative human resources needed, based on a pro-rated cost reimbursement structure that is included in the budget of the project. Also, based on the expected level and volume of incremental responsibilities for the IEMA directly related to technical supervision of consultancy services, to administrative and financial arrangements and to monitoring and evaluation of project implementation, additional personnel will be contracted through fixed-term consultancies, to be funded with resources from the Project and selected and contracted pursuant the non-objection by the Bank. The IEMA will ensure presence of its technical/project personnel in the

geographic areas of the Project in coordination with the technical counterparts assigned to the project by the MoC, through its National Secretariat of Transport and Urban Mobility (SNTMU) and by the Municipalities of the four (4) pilot projects to be financed by Component 2 (¶1.26; OEL#8).

3.5 **Government Beneficiaries participating in the Project.** The main beneficiary will be the MOC, through its SNTMU, which will act as technical coordinator responsible for: (i) the overall strategic guidance and technical coordination of the Project; (ii) granting the non-objection to the PEP and corresponding Annual Operations Plans (AOPs) (REL#2), the Procurement Plan (PP) and semiannual progress reports; (iii) coordination with the Municipalities of the four pilot projects to be financed by Component 2, and with other governmental agencies involved in project implementation; (iv) the review of the products and technical reports resulting from project implementation ensuring that the Project's progress execution and results are timely, consistent and contribute to the attainment of Project's strategic objectives; (v) participation in major related events and seminars; and (vi) monitoring and reporting on local parallel financing and local in kind counterpart to the PEU and the Bank. To carry out its responsibilities, the SNTMU will have a GEF Project Coordination Unit (PCU) composed of: one project coordinator; one project manager; and one technical staff. Other beneficiaries will be the Municipalities of: (i) Fortaleza (CE); (ii) Belo Horizonte (MG); (iii) São Paulo (SP); and (iv) the Federal District (DF). These beneficiaries will develop together with the IEMA the activities that will forward Component 2 goals, providing their technical capabilities and local knowledge; in order for the IEMA to provide them technical and institutional assistance and guidance, the parties will sign a cooperation agreement establishing their responsibilities within the project's framework. **It will be special contractual conditions prior to the first disbursement of the IDB's/GEF non-reimbursable resources: (i) the entry into effect of the Operational Manual of the Project, in accordance with the terms previously agreed upon with the Bank; (ii) the execution and entry into effect of the Cooperation Agreement between the SNTMU and the IEMA; (iii) the evidence of the establishment, within the organizational structure of SNTMU, of the PCU; and (iv) the evidence of the establishment, within the organizational structure of IEMA, of the PCU.**

3.6 Specifically for the construction of approximately 7 km of bike lanes (the only civil works to be financed by the project corresponding to Subcomponent 2.3), the Fortaleza Municipality (MoF) will act as the co-executing agency for the works activities set forth in subcomponent 2.3. The IEMA and MoF will execute a specific Cooperation Agreement, in order for the IEMA to transfer to this Municipality the IDB/GEF funds needed for the payment of eligible expenses for the referred bike lanes. The MoF shall observe the Bank's Policies for the Procurement of Works and Goods (GN-2349-9), as well as it will have to report on the use of these resources according to the Bank's policies and procedures. The MoF is the executing agency of two Bank's loan-Fortaleza Urban Transport Program 1º Phase (BR0302) and 2º Phase (BR-L1333); this last one will be submitted to the Board during 2014. An institutional evaluation of MoF that was

recently conducted by the Bank as part of BR-L1333 operation showed that it has adequate internal administrative, technical and overall organizational and internal control capabilities to execute the pilot project. The execution and entry into effect of a specific Cooperation Agreement between IEMA and Fortaleza Municipality will be a special contractual condition prior to the execution of any activity in that Municipality related to the bike path's design and execution financed by Subcomponent 2.3. The entry into effect of cooperation agreements to be executed by IEMA and the Federal District, the Municipalities of Sao Paulo and Belo Horizonte, will be a special contractual condition prior to the execution of the activities of Component 2 in the cities of Brasilia, Sao Paulo and Belo Horizonte, respectively.

3.7 **Disbursement, procurement, supervision and external audit**. The Bank will disburse the financial resources to the PEA based on an initial advance and periodic requests for advance of funds. Procurement administration of the Project will take place in accordance with IDB's policies (Chapter I) and with established private sector and commercial practices acceptable to the IDB. The disbursements of the project will be subject to ex post supervision by the Bank and by the external auditors. The financial statements of the project will be subject to annual external audits to be conducted by an external public accountants company, which will be contracted by the IEMA with IDB/GEF resources (Annex III).

B. Summary of arrangements for monitoring and evaluation

3.8 Project Monitoring and Evaluation (M&E) will be conducted in accordance with IDB and GEF procedures, at three levels: (i) project outcomes and impacts as stated in the projects results framework; (ii) delivery of project outputs in accordance with the AOP; and (iii) monitoring of project implementation and performance through periodic project evaluations.

3.9 The project's Results Framework in Annex II will be the main monitoring instrument. The project team will supervise the achievement of the outputs and outcomes associated to BID/GEF funding and will incorporate them in the Project Monitoring Report (PMR); the project team will also incorporate all project outputs and outcomes associated to the financing and parallel financing into the Project Implementation Reports (PIR), to be reported periodically to GEF. The AOP will be used to monitor implementation progress.

3.10 Ex post evaluation of the project will include a socioeconomic evaluation and an assessment of the impacts of the project both in terms of the improvements in GHG emissions estimates and in GHG emissions reductions resulting from pilots and from the implementation of the proposed framework and guidelines in new urban transportation projects. Further details on monitoring and evaluation arrangements can be found in REL#3.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	Aligned		
Lending Program	Lending to support climate change initiatives, renewable energy and environmental sustainability.		
Regional Development Goals	i) CO2 emissions (kilograms) per $1 GDP (PPP); and ii) Countries with planning capacity in mitigation and adaptation of climate change.		
Bank Output Contribution (as defined in Results Framework of IDB-9)	i) Number of people given access to improved public low-carbon transportation systems; ii) National frameworks for climate change mitigation supported; and iii) Climate change pilot projects in agriculture, energy, health, water and sanitation, transport, and housing.		
2. Country Strategy Development Objectives	Aligned		
Country Strategy Results Matrix	GN-2662-1	Support large and medium-sized Brazilian cities in improving urban transportation.	
Country Program Results Matrix	GN-2756-2	The intervention is not included in the 2014 Operational Program.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	Highly Evaluable	Weight	Maximum Score
	9.1		10
3. Evidence-based Assessment & Solution	9.8	33.33%	10
3.1 Program Diagnosis	3.0		
3.2 Proposed Interventions or Solutions	4.0		
3.3 Results Matrix Quality	2.8		
4. Ex ante Economic Analysis	10.0	33.33%	10
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	4.0		
4.2 Identified and Quantified Benefits	1.5		
4.3 Identified and Quantified Costs	1.5		
4.4 Reasonable Assumptions	1.5		
4.5 Sensitivity Analysis	1.5		
5. Monitoring and Evaluation	7.5	33.33%	10
5.1 Monitoring Mechanisms	2.5		
5.2 Evaluation Plan	5.0		
III. Risks & Mitigation Monitoring Matrix			
Overall risks rate = magnitude of risks*likelihood	Medium		
Identified risks have been rated for magnitude and likelihood	Yes		
Mitigation measures have been identified for major risks	Yes		
Mitigation measures have indicators for tracking their implementation	Yes		
Environmental & social risk classification	B		
IV. IDB`s Role - Additionality			
The project relies on the use of country systems			
Fiduciary (VPC/PDP Criteria)	Yes	Financial Management: i) budget; ii) accounting and reporting; iii) external control; and iv) internal audit.	
Non-Fiduciary			
The IDB's involvement promotes improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality			
Labor			
Environment			
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	Technical Cooperation BR-T1276 was approved to support the project.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan			

The POD presents the problems to be addressed through the project. The magnitude of the problems and the factors that contribute to them are based on empirical evidence. The proposed interventions are linked to the problems identified in the diagnosis.

The results matrix has vertical logic. All the impact, outcome and output indicators are SMART, have baselines, targets and sources of verification.

The project was analyzed using a cost-benefit analysis. The economic rate of return for the program was obtained aggregating the costs and benefits of the four cities which might be masking the fact that interventions in some of the cities are not economically viable. An economic analysis was also undertaken for Fortaleza. This analysis adequately calculated the economic benefits and the costs reflected real resource costs to the economy. The analysis presented the assumptions used, and a sensitivity analysis was undertaken.

The project has a monitoring and evaluation plan. The evaluation plan follows the DEM guidelines. The operation will be evaluated using a reflexive methodology and an ex-post economic analysis.

RESULTS MATRIX

Project Objective:	The project's main objective is the development and implementation of sustainable mobility planning knowledge and tools aimed at the inclusion of climate change considerations in urban transportation projects in major cities, in order to contribute towards the achievement of Brazil's voluntary commitment of a reduction in GHG emissions between 36.1% and 38.9% by 2020. Specifically, the project will support the development of sustainable transport design and GHG emissions assessment tools, the implementation of pilot projects, and training and dissemination activities targeting major Brazilian cities.		
Impact Indicators			
Impacts	**Base**	**Final (2034)**	**Means of Verification/ Comments**
Reduction of emissions of CO2eq generated by public transport in Fortaleza Belo Horizonte, São Paulo and Brasília (total emissions over a 20-year period) Indicator : Tons of CO2eq	0 *	1,481,863 **	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and Emission Reduction Estimator calculations for all the transportation investments

* The result of TEEMP models for the MRT projects that are going to be implemented in the four cities after the program.

** The result of TEEMP models for the MRT projects that are going to be implemented in the four cities after the program, considering that they are going to be enhanced by the use of tools developed by this project in order to be more attractive transportation options. This was estimated by giving the MRT systems a higher level in the TEEMP scorecard, in this way the BRTs had 70 out of 100 points and all were raised to 80 points in a conservative scenario (which is presented as the target). This estimated emission reduction volume considers the effects of a potential extra mode shift in Belo Horizonte due to the TDM strategy that will be developed within the program, and also the effects of an additional attractiveness of the MRT systems in Brasília due to the development, within the program, of an NMT plan to better integrate the city's transit lines with non-motorized modes in the future. Further enhancements of MRT projects in other cities are expected to lead to greater emissions reductions, scaling up the contribution of the project towards the achievement of Brazil's voluntary commitment of GHG emissions reduction.

Outcome Indicators			
Results (Outcomes)	**Base**	**Target (2018)**	**Means of Verification/ Comments**
Outcome 1: Average annual emissions of CO2eq avoided with implementation of tools developed by the project in public transport projects financed with parallel investments in Fortaleza Indicator 1: Tons of CO2/year	0*	5,423**	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and ex-post evaluations during the program
Outcome 2: Average annual emissions of CO2eq avoided in Fortaleza with GEF pilot bikeways implemented and integrated with public transport financed by parallel investments Indicator 2: tons of CO2/year	0	2,332***	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and ex-post evaluations during the program
Outcome 3: Average annual emissions of CO2eq avoided with implementation of TDM Strategy in Belo Horizonte Indicator 3: Tons of CO2/year	0	1,403	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and ex-post evaluations during the program
Outcome 4: Average annual emissions of CO2eq avoided with implementation of NMT Strategy in Brasilia Indicator 4: Tons of CO2/year	0	838	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and ex-post evaluations during the program
Outcome 5: Average annual emissions of CO2eq avoided with implementation of tools developed by the project in São Paulo Indicator 5: Tons of CO2/year	0	1,496	TEEMP Calculations (GEF4949_OPTIONAL6_InitialEmissionReductionEstimates.docx) and ex-post evaluations during the program
Outcome 6: Daily bicycle trips on pilot bikeways Indicator 6: number of daily trips	0	1.701	Semiannual Project Report
Outcome 7: Federal and local government officials trained on transport GHG emissions assessment and monitoring Indicator 7: number of trained people	0	40	Semiannual Project Report
Outcome 8: Federal and local government officials trained on sustainable mobility measures Indicator 8: number of trained people	0	40	Semiannual Project Report

* The result of the TEEMP_BRT model for the MRT projects that are being implemented in Fortaleza and that are going to be concluded within this program's years. The city's 4 BRTs have a scorecard of 48 out of 100 points while the LRT has a scorecard of 71 points. The projects included in this calculation are: Bezerra/Papicu BRT; BR-116/Aguanambi BRT; Alberto Craveiro and Raul Barbosa World Cup BRTs; Parangaba/Mucuripe LRT

** The result of the program's materials being used to enhance the Fortaleza's MRT projects that are being implemented within the program's duration, the calculations were done by enhancing their scorecards. The two IDB financed BRTs had their scorecards raised to 64 and 76.

*** The calculations involved using the TEEMP_Bike model for estimating the emission reductions due to the bikeway's implementation itself and the TEEMP_BRT model to estimate the effect of the bikeways' integration with the MRT projects (3 extra points in the scorecard). The bikeway's demand used for calculating the bikeway's emission reductions was estimated based on the TEEMP_BRT model for the integrated MRT projects, which resulted in an estimate of 1,701 daily passengers for the first bikeway and 1,386 daily passengers for the second bikeway. If the bikeway's demand is estimated based on the sketch model, which makes the calculation based on the construction quality, extension and width of the bikeway, the proposed infrastructures will have capacity to absorb 14,380 daily trips and reduce emissions by 196,408 CO2eq tons in 20 years, an average of 9,820 CO2eq tons/year.

Component 1: Sustainable Urban Mobility Framework for Brazilian Large Cities								
Component 1 - Products (Outputs)	**Indicator**	**Base**	**Yr 1**	**Yr 2**	**Yr 3**	**Target**	**Means of Verification/ Comments**	**Costs US$ (thousands)**
P1.1 Draft of a regulatory framework for the inclusion of climate change considerations in the assessment of transport investments developed	Draft	0	0	0	1	1	MoV: Semiannual Project Report[1], Guideline Final Report	376.57
P1.2.1 Technical Guideline on Non-motorized Transport Planning developed	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	248.29
P1.2.2 Technical Guideline on Traffic Demand Management (TDM) developed	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	243.59
P1.2.3 Technical Guideline on Priority Measures for Public Transit developed	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	204.11

[1] Semiannual Progress Reports will be elaborated by IEMA and delivered to IDB within 60 days of the end of the semester, and shall include, among others, the following information about Products: Products contracted, activities developed within product development, product's progress reports delivered, planned activities and, upon delivery, Final Product Report.

P1.2.4 Technical Guideline on Intelligent Transportation System (ITS) developed	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	294.77
P1.2.5 Technical Guideline of Best Practices on Urban Mobility	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	218.12
P1.2.6 Technical Guideline for Estimating and Evaluating GHGs emissions from urban mobility projects developed	guideline	0	0	0	1	1	MoV: Semiannual Project Report, Guideline Final Report	182.36
P1.3 Capacity Strenghtening Course for MoC implemented	course	0	0	1	0	1	MoV: Semiannual Project Report	108.51
Component 2: Pilot Demonstrations								
Component 2 - Products (Outputs)	**Indicator**	**Base**	**Yr 1**	**Yr 2**	**Yr 3**	**Total**	**Means of Verification/ Comments**	**Costs US$ (thousands)**
2.1.1 System to estimate, and evaluate the reduction of GHGs emissions developed	System	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	1,794.80
2.1.2 System interface developed and accessible to MoC personnel	interface	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	354.30
2.1.3 Ex-post modal shift evaluation methodology developed	methodology	0	1	0	0	1	MoV: Semiannual Project Report, Product Final Report	310.90
2.1.4 Ex-post modal shift evaluation applied in each city to estimate modal shifts	evaluation	0	0	1	0	4	MoV: Semiannual Project Report, Product Final Report	275.85
2.2.1.1 TDM Strategy developed for Belo Horizonte	strategy	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	280.10
2.2.1.2 GHG emissions reductions calculated for Belo Horizonte	calculation	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	49.42
2.2.2.1 NMT Strategy developed for Brasilia	strategy	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	280.10
2.2.2.2 GHG emissions reductions calculated for Brasilia	calculation	0	0	1	0	1	MoV: Semiannual Project Report, Product Final Report	49.42
2.3.1 km of bicycle paths built in Fortaleza	km	0	0	0	7	7	MoV: Semiannual Project Report, Product Final Report	1,409.04

Products to be achieved through Parallel Financing Resources [2]								
2.3.2 Km of BRT in operation (Corridors 1 and 4)	32.6 km of BRT	0	0	0	32.6	32.6	MoV: Semiannual Project Report	45,666[3]
2.3.3 Km of BRT in operation (Alberto Craveiro)	6.0 km of LRT	0	6.0	0	0	6.0	MoV: Semiannual Project Report	14,859[4]
2.3.4 km of LRT - Light Rail Transit	12.7 km of LRT	5	0	7.7	0	12.7	MoV: Semiannual Project Report	80,950
Component 3: Capacity Building and Dissemination								
Component 3 - Products (Outputs)	**Indicator**	**Base**	**Yr 1**	**Yr 2**	**Yr 3**	**Total**	**Means of Verification/ Comments**	
3.1. courses for government officials and relevant stakeholders at national and local level on transport GHG emissions assessment and monitoring provided	courses	0	0	0	3	3	MoV: Semiannual Project Report	317.08
3.1.2 courses for government officials and relevant stakeholders on sustainable urban mobility measures given	courses	0	0	0	5	5	MoV: Semiannual Project Report	424.31
3.2 Outreach materials published	publications	0	0	0	6	6	MoV: Semiannual Project Report	1,120.19
3.3 Seminars to showcase the outputs from Components 1 and 2 undertaken	seminars	0	1	0	1	2	MoV: Semiannual Project Report	207.33

[2] These will not be financed by the project but are complementary to the project. They will be financed by other funding at the same time this project is implemented and are necessary to obtain outcomes 1 and 2 presented in this matrix.
[3] Total investments on these corridors reach US$219 million; the stated amount of US$45.7 million corresponds to incremental funding for improvements over the PAC financed projects in terms of overall performance and GHG emissions, including improvements of station design and better interface bus-station, passenger information system, universal access, secure bicycle parking at terminals and stations, etc.
[4] The amount includes US$11.2 million from the Federal Government (hard loan) and US$3.6 million form the local government (in kind).

FIDUCIARY ARRANGEMENT

COUNTRY:	Brazil
PROJECT NUMBER:	BR-G1006
NAME:	Low Carbon Urban Mobility for Large Cities in Brazil
EXECUTING AGENCY:	*Instituto Energia e Ambiente* – (IEMA)
PREPARED BY:	IDB

I. EXECUTING AGENCY FIDUCIARY CONTEXT

1.1 The Project Executing Agency (PEA) is the *Instituto Energia e Ambiente* (IEMA). The IEMA is a non-profitable organization, working for the formulation, implementation and evaluation of public policies of urban mobility, improvement of air quality and reduction of greenhouse gases (GEH) emissions. As part in the design of the operation, the team project made an evaluation of the institutional capacity of IEMA through: visit to the institution, analysis of manuals and procedures, interview with personal key, verification, functionality and analysis of the information and management systems, control environment and result of the risk analysis, GRP.

1.2 As a result of our assessment we conclude that IEMA has large experience in executing project (internally or through contracts) and funds from different funding bodies as William and Flora Hewlett Foundation and Climate Works Foundation. It's specialized in the management of grants and contracts, specifically through: (i) supporting and monitoring technical and legal requirements of funding bodies; (ii) coordinating the acquisition of goods and services; and (iii) accounting and financial management and accountability of funds from funding bodies. Also, IEMA has rules and procedures needed and an information system that meets the Bank's requirements for execution and control, as well the Internal Control is in place.

1.3 Also, as part of the institutional capacity assessment was verified that despite of the responsibilities of the Audit Committee of IEMA's Supervisory Board, the Institution is entering into a contractual agreement with its external auditor to conduct annual audits of the financial management, administration and internal control systems, while maintaining the scope of the annual external audit.

1.4 As PEA, the IEMA will be responsible for the technical, financial and fiduciary execution and administration of the Project.

1.5 To ensure an effective compliance by the IEMA with its technical, financial and management responsibilities, including project monitoring and evaluation under strict Bank and GEF guidelines, the Bank will do supervision visits, training, and reviews of external auditors with specific

terms of reference. The Risk Matrix shows the identified risks as well as their individual mitigation and monitoring actions.

1.6 **Disbursement.** The Bank will disburse the financial resources to the IEMA based on and initial advance and periodic requests for advance of funds. For this purpose, IEMA will open a bank account for the exclusive management of the project's financial resources. The advance of funds will be subject to the progress attained in the physical and financial implementation of the components and activities of the project, based on: (a) the project execution plan; (b) the annual operations plan; (c) the presentation by the IEMA of the documentation supporting the commitments and actual expenses of the previously advanced resources, and (d) the six-month commitments and cash flow projections. For this purpose, the IEMA will apply the Manual of Disbursement Procedures of the Bank, and its execution will be subject to the request and justification of the advances of funds.

1.7 **Exchange rate.** The IEMA will maintain budgetary and accounting records and financial statements of the project in United States Dollars (US$) and Brazilian Reais (R$), and will present them to the Bank in US$ following the stipulations of the Non-Reimbursable Financing Agreement. The applicable exchange rate for rendering of accounts will be the same as the effective rate used for the conversion from US$ to R$ for the execution of the corresponding disbursements (internalization date).

1.8 **Procurement.** Procurement administration of the project will take place in accordance with established private sector and commercial practices acceptable to the IDB, as per the terms of IDB Procurement Policies (documents GN-2349-11 and GN-2350-9). Use of private sector procurement regulations is warranted due to the IEMA's private sector nature. The procurement of goods and services, including the selection and contracting of consultants with resources from the IDB/GEF non-reimbursable financing, will follow the norms and procedures of the IEMA as contained in the IEMA Procurement Manual. The IEMA and the Bank have agreed on a "Procurement Plan" for the 36 months of execution. Any change or revision of the Procurement Plan by the IEMA will be submitted to the Bank for non-objection. The supervision of the procurement function by the IDB will be based on the "ex post" modality.

1.9 **Reimbursement of Expenditures Chargeable to the Non-Reimbursable Financing (Retroactive finance).** There is no retroactive finance in this program.

1.10 **Recognition of Expenses chargeable to the local Contribution.** The Project does not contemplate the recognition of expenditures incurred prior to the date of theNon-Reimbursable Financing approval, chargeable to the local counterpart.

1.11 **Supervision.** The disbursements of the project will be subject to ex-post supervision by the Bank and by External Auditors.

1.12 **Systems.** For this purpose, the IEMA will use its financial management system, which contains real-time and end-of-period information on procurement, accounting and financial transactions of the project, along with financial statements and any other reports required by the IDB/GEF.

1.13 **Internal Controls.** The IEMA will use its internal control norms and procedures as well as its systems capabilities to provide timely and transparent financial information and reports to the Bank, in compliance with the Non-Reimbursable Financing Agreement. In addition, the IEMA will use its internal records management system and procedure to safeguard the project's physical and electronic data, records and information, and to guarantee their availability and accessibility by the Bank, external auditors and pertinent internal instances.

1.14 **External Audit.** The financial statements of the project will be subject to annual external audits to be conducted by a firm of external public accountants, which will be contracted by the IEMA with IDB/GEF resources. The external audit will comply with the terms of reference approved by the Bank. The audited financial statements will be presented to the bank by the IEMA within 90 days of the conclusion of the fiscal year. The Bank will accept the audit firm of the IEMA if this is eligible to the Bank.

LOW CARBON URBAN MOBILITY FOR LARGE CITIES

BR-G1006

CERTIFICATION

The Grants and Co-financing Management Unit (ORP/GCM) certifies receipt of the GEF Council's Endorsement letter dated on August 4, 2014 for project Low Carbon Urban Mobility for Large Cities for US$6,000,000, chargeable against the GEF Trust Fund (GEFTF).

Original Signed	8/20/2014
Sonia M. Rivera Chief Grants and Co-financing Management Unit ORP/GCM	Date

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/14

Brazil. GRT/FM-_____-BR. Nonreimbursable Investment Financing of the Global Environment Facility (GEF). Low Carbon Urban Mobility for Large Cities

The Board of Executive Directors

RESOLVES:

1. That the President of the Bank, or such representative as he shall designate, is authorized in the name and on behalf of the Bank, as Administrator of the IADB/GEF Fund, to enter into such agreement or agreements as may be necessary with the Instituto de Energia e Meio Ambiente (IEMA), as Executing Agency, the Municipality of Fortaleza as Co-Executing Agency, and the Federative Republic of Brazil, the Municipalities of Belo Horizonte, Fortaleza, and São Paulo, and the Federal District, as Beneficiaries, and to adopt such other measures as may be pertinent for the execution of the project proposal contained in document PR-____ with respect to a nonreimbursable investment financing chargeable to the resources of the Global Environment Facility (GEF) for the development and implementation of a project to promote low carbon urban mobility for large cities.

2. That up to the sum of US$6,000,000 is authorized for the purposes of this resolution chargeable to the resources of the IADB/GEF Fund.

3. That the above-mentioned sum is to be provided on a nonreimbursable basis.

(Adopted on ___ _____ 2014)

LEG/SGO/CSC/IDBDOCS: 38972974
Pipeline No.: BR-G1006