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REGIONAL

HYBRID BUS TEST PROGRAM IN BRAZIL AND COLOMBIA

(RG-T1798)

PLAN OF OPERATIONS

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ELECTRONIC REFERENCES	
Socioeconomic data	http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata
Request and commitment letters from municipalities	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35083277
Draft detailed proposal	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35060983
Draft terms of reference consultant (test design)	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35060991
Draft terms of reference consultant (test execution)	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35060996
Draft terms of reference consultant (test design)	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35061000

ABBREVIATIONS

BRT	Bus Rapid Transit
CO ₂	Carbon dioxide
CC	Climate change
CIF	Climate Investment Funds
WJCF-CCI	Clinton Climate Initiative, a program of the William J. Clinton Foundation
GHG	Green house gas
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel for Climate Change
ICCT	International Council on Clean Transportation
IEA	International Energy Agency
ITDP	Institute for Transportation and Development Policy
LAC	Latin America and the Caribbean
SECCI - MSC	Sustainable Energy and Climate Change Multi-Donor Fund
TC	Technical Cooperation
TDM	Travel Demand Management

PLAN OF OPERATIONS

HYBRID BUS TEST PROGRAM IN BRAZIL and COLOMBIA (RG – T1798)

I. EXECUTIVE SUMMARY

Beneficiary:	Clinton Climate Initiative, a program of the William J. Clinton Foundation
Project Team:	Felipe Targa (INE/TSP) and Rosana Diniz Brandao (INE/TSP) project co-leaders, Elizabeth Beall (INE/ECC), Michael Rattinger (INE/ECC), Dalve Alexandre Soria Alves (TSP/CBR), Sergio Deambrosi (TSP/CCO), Carlos Mojica (INE/TSP), Rosina de Souza (LEG/SGO), and Sandra Iriarte (INE/TSP)
Target Beneficiaries:	The cities of Bogota, Colombia; and Curitiba, Rio de Janeiro and Sao Paulo, Brazil.
Executing Agency:	Clinton Climate Initiative, a program of the William J. Clinton Foundation
Sources of funding:	IDB: Sustainable Energy and Climate Change Multidonor Fund – (SECCI - MSC): US\$ 1,498,751 Clinton Climate Initiative (cities included) ¹ : <u>US\$ 5,753,653</u> Total: <u>US\$ 7,252,404</u>
Objectives:	The main objective of this Technical Cooperation is to significantly accelerate the ability for cities to incorporate more fuel efficient, low-carbon buses in their transit systems, thereby greatly reducing CO ₂ emissions. The project consists of a multi-city coordinated hybrid test bus program with the objective of providing data and analysis to municipalities throughout the region regarding the reliability of hybrid buses, estimated emissions reduction and life-cycle costs, and other benefits and risks associated with the adoption of hybrid bus technology.
Execution Timetable:	Execution: 18 months Disbursements: 21 months
Special contractual Conditions:	Special execution condition: for the execution of component 2 (test execution), evidence will be provided that a supply agreement, or equivalent instrument, has been signed for the hybrid buses involved on the test (¶3.5).
Exceptions to Bank Policies and Procedures:	None
Environmental and Social Review:	No negative environmental and social impact has been identified from this regional technical cooperation. This Technical Cooperation is a category “C” (¶8.1).

¹ The Clinton Climate Initiative is facilitator for in-kind contributions.

II. BACKGROUND AND JUSTIFICATION

- 2.1 Climate change (CC) is one of the greatest challenges of our generation and affects all sectors of the economy and society, and may impair sustainable growth. CC needs to be tackled with urgency and requires bold and well-coordinated action.
- 2.2 The Intergovernmental Panel for Climate Change (IPCC) calls for a reduction in green house gas (GHG) emissions of 25-40% in developed countries and of 15-30% in developing countries by 2020, compared to the 1990 levels. In addition, the IPCC appeals for a 70-90% reduction from 1990 levels of global carbon dioxide (CO₂) emissions from fossil fuels for the period 2020-2050. While achieving these reductions by 2020 could in theory still be possible, the recommended 2050 emission levels are not achievable without a massive involvement and changes of the transport sector in developing countries.
- 2.3 Transport plays a very important role in CC. Being the lifeline of the economy, transport is one of the largest consumers of fossil fuels and therefore contributes in a significant manner to GHG emissions. The International Energy Agency's (IEA) figures show that transport worldwide is responsible for more than 60% of oil consumption, 13% of global GHG emissions and 23% of global CO₂ emissions from fuel combustion. It is also a sector where emissions will be difficult to abate since it is the fastest growing source of CO₂ emissions in developing countries.
- 2.4 Transport GHG emissions are expected to increase about 57% worldwide by 2030, and 80% of this increase will come from developing countries. By 2030, the transport sector is also expected to account for 75% of the increase in oil demand. Transport energy use in developing countries will increase at the rate of about 3% per year, four times faster than the rate for developed countries (IEA, 2008).
- 2.5 In Latin America, the transport sector is the largest contributor of CO₂ emissions from energy consumption, producing a staggering 35% of these emissions, compared with a 24% share worldwide. Road transport accounts for 90% of transport emissions in the region, half produced by passenger traffic and the other half by freight transport. GHG emissions from the transport sector are expected to increase as a result of urbanization, rapid motorization and growth in both domestic and international trade of export goods and services. In Latin America and the Caribbean (LAC), more than 70% of the population lives in urban areas, coupled with a trend of increased vehicle ownership and use. This motorization trend will be maintained since it is highly correlated with the increase of personal income and the decline of vehicles' real value. Overall, the region's car ownership, use and emissions are higher than the expected based on populations and Gross Domestic Product (GDP) levels.
- 2.6 Moreover, cities are growing so quickly that infrastructure provision cannot keep up and there is a growing trend towards urban sprawl and decentralization from urban centers. This type urban development leads to less available and less profitable public transport services, increasing personal vehicle use and miles traveled, and thereby further accelerating the growth in GHG emissions. With a

majority of the earth's population now living in urban areas (70% in LAC), cities contribute more than two-thirds of global GHG emissions. Leapfrogging may be an important element for developing countries in their efforts to reduce GHG emissions from the transport sector; bypassing unsustainable urban development and the use of less efficient and more polluting modes of transport.

- 2.7 In general, there are three different ways for the transport sector to reduce its carbon footprint; by reducing the demand for travel, the emissions per unit transported, and the emissions per kilometer traveled. Focusing on the urban problem, evidence suggests that initiatives considering a comprehensive sustainable urban transport approach take advantage of a variety of instruments that work together in these three general ways. Ideally, a holistic, integrated strategy to reduce emissions in the urban transport sector should follow an Avoid-Shift-Improve approach. This approach recognizes that to reduce/**avoid** travel it will have to be a better integration of land use and transport planning policies, coupled with Travel Demand Management (TDM) measures. If travel needs to take place, it will be important to **shift** from private vehicles to public transport and non-motorized transport modes. And finally, it will also be important to **improve** transport efficiency through energy/fuel standards, and the introduction of new technologies. By addressing the impacts of CC through sustainable transport instruments, cities are also able to benefit from a range of additional co-benefits, including improved air quality, reduced congestion and noise levels from traffic, improved road safety, and social inclusion as a result of more accessible transport services.
- 2.8 Some Latin American cities have been active implementing sustainable transport measures, mainly through the implementation of Bus Rapid Transit (BRT) systems, and other initiatives incorporating a coordinated urban planning strategy towards sustainable mobility and urban development. The BRT systems in Bogota and Curitiba are good examples of this transformation. Other cities are moving from a corridor approach (BRT corridors) to a holistic programmatic approach, expecting to consolidate the transformation towards a sustainable, low-carbon sector in the region. This approach includes the implementation of cleaner and more efficient technologies in vehicles and public transport systems. One of the clean technology options being considered is hybrid engines for public buses. However, there are still many barriers to clean technology deployment, including higher upfront costs, lack of piloted data and results, assumed higher risk given unfamiliar technology, among others. The identification and estimation of the associated costs of these barriers will be necessary for the design and structuring process of the next generation of sustainable, low-carbon public transport systems that are being planned in several cities in the region. A clear understanding of these costs, as well as the underlying regulatory, legal and institutional barriers, will also help to facilitate the availability of additional financing to scale-up these initiatives. These financing sources may include the Climate Investment Funds (CIF) or the next generation of programmatic financial instruments that are being designed for the sector in order to tackle CC.

- 2.9 The IDB has supported its member countries by providing technical and financial assistance to implement these initiatives. In addition to traditional loan operations to finance the implementation of sustainable transport projects in the region, the IDB approved in 2007 the Sustainable Energy and Climate Change Initiative (SECCI). This initiative is intended to support the LAC region in its urgent challenge to find economically and environmentally sound energy options, while confronting the challenges of CC. SECCI's core objectives are to expand the development and use of renewable energy sources, energy efficiency technologies and practices, and carbon finance in the region, as well as to promote and finance CC adaptation strategies that reduce the regions climate vulnerability. The initiative recognizes that clean technologies, to use resources and energy more efficiently, are key to reducing GHG emissions.
- 2.10 At the same time, other initiatives are launching worldwide to make a difference in the fight against CC in practical, measurable and significant ways. The Clinton Climate Initiative (WJCF-CCI), launched in 2006, is serving as the exclusive implementing partner of the C40 Large Cities Climate Leadership Group, an association of large cities around the world that have pledged to accelerate their efforts to reduce GHG emissions. WJCF-CCI is assisting partner cities to develop and implement large-scale projects that result in substantial energy use and GHG emissions reductions. In the transport sector, these projects include the development and implementation of public and non-motorized transport systems, expanding BRT systems with the analysis of clean fuel and vehicle options, and the development of financing mechanisms. WJCF-CCI has a specialized practice of working with cities and suppliers to lower product prices and to help coordinate test fleets for clean technology vehicles in cities, most notably for hybrid diesel buses. WJCF-CCI has also several partnerships with specialized world-class transport institutions, including the International Council on Clean Transportation (ICCT) and the Institute for Transportation and Development Policy (ITDP), among others.
- 2.11 In this context, the WJCF-CCI is working with selected LAC cities in the development and implementation of a multi-city coordinated hybrid test bus program. The program includes Bogota, and three Brazilian cities that will coordinate the test together: Rio de Janeiro, Sao Paulo, and Curitiba. Each of these cities has expressed direct interest in actively participating in the testing program, and each dedicating significant resources to ensure the programs' success.² Lima is expected to be interested in a future phase of the program, and other LAC cities are likely to be interested in using results of the initial tests, which will demonstrate technical performance, and the economics of hybrid bus technology.
- 2.12 The WJCF-CCI, on behalf of the designated participating LAC cities in the Latin American Hybrid Test Bus Program, has requested financial support from the IDB's SECCI fund to conduct the Program. The Program is consistent with

² The letters of commitment and support from the participating cities are available in the electronic references.

SECCI's general mission to support the LAC region in its urgent challenge to find economically and environmentally sound energy options. In particular, the hybrid bus test Program is consistent with SECCI's core objectives to participate in scalable project financing to expand the development and use of renewable energy sources, energy efficiency technologies and practices. The Program is also consistent Bank's country strategies with Colombia (GN-2474) and Brazil (GN-2327-1) by increasing competitiveness and social development, through support of actions to improve the public transport systems with significant environmental benefits.

- 2.13 The implementation of the hybrid bus test Program will have the potential to stimulate the next generation of urban transport systems in the participating cities. This potential represents major scaling-up of current efforts in key cities promoting sustainable transport initiatives, and will have wider regional impacts. If deemed feasible, the adoption of hybrid bus technologies in these cities has the potential to bring down the costs of alternatives by providing incentives for manufacturers to deploy the manufacturing of this technology throughout the region. In particular, the results of this Program are expected to foster the procurement of hybrid bus technology for cities in the region where BRT are in development or where conventional bus fleets are to be replaced or expanded. The replication and scalability potential will be enhanced with IDB technical and financial operations in the region.

III. PROGRAM DESCRIPTION

- 3.2 **Objective.** The main objective of this project is to significantly accelerate the ability for cities to incorporate more fuel efficient, low-carbon buses in their transit systems, thereby greatly reducing CO₂ emissions. The project consists of a multi-city coordinated hybrid test bus program with the objective of providing data and analysis to municipalities throughout the region regarding the reliability of hybrid buses, estimated emissions reduction and life-cycle costs, and other benefits and risks associated with the adoption of hybrid bus technology
- 3.3 In order to achieve the objective stated above, this Technical Cooperation (TC) will finance three components: (i) test preparation, including test design and protocols; (ii) test execution; and (iii) economic and technical analysis of external factors. The TC will include training, technical studies and analysis, purchase of testing equipment, and information dissemination. Buses for the test program will be provided by the suppliers as in kind contributions and made available by the Executing Agency. The next paragraphs provide more detail on the activities and products expected for each component.
- 3.4 **Component 1: Test preparation.** This component will include a review and analysis of each of the technologies to be included in the test; specific technical and performance differences of each technology that could affect test results. The activities to be financed will also include the development of methodologies for assessing cities driving cycles and for the scope and design of the hybrid bus tests. Finally, the component will include the identification of program risks and

- mitigation measures, a review of stakeholders and their commitments, and preparation of measurements and deliverables for each test and city.
- 3.5 ***Component 2: Test execution.*** This component will include tests in each city of selected buses from the suppliers and made available by the Executing Agency, of up to 10 hybrid buses in total. Each hybrid bus will be tested against a close to new diesel bus (baseline bus) with the same driving cycle. All testing will include bus import and legal processing, tuning, driver training, mechanics training, and maintenance. Within this component there will be two tests performed; one assessing bus performance (air emissions and propulsion systems) at maximum loading capacity with weights; and one assessing bus performance (air emissions and propulsion systems) over a 120 days operating under normal operating conditions. This component will also include operation costs analysis under different scenarios, data analysis, and report preparation on the results of the tests. For the execution of this component, as a **special execution condition** on this TC, the Executing Agency will provide evidence that a supply agreement, or equivalent instrument, has been signed for the provision of hybrid buses.
- 3.6 ***Component 3: Economic analysis.*** This component will include an analysis and recommendations for structuring the economic, financial, institutional, and regulatory strategy to foster the hybrid technology market in LAC. Specific attention will be given to finding solutions for the existing barriers, mainly addressing the incremental cost that exists between the conventional and hybrid technologies (period to be adjusted according to results from Component 1). This component will also include analysis and development of financial strategies and tariff structures to enable cities to increase or transform the bus fleets to include hybrid buses, and a strategy for information dissemination of the results.
- 3.7 The project will be executed in three distinct phases. The detailed proposal of components, activities and products is presented in the electronic references. Specific objectives are targeted for each phase. Such milestones, agreed-upon with the Executing Agency, will trigger disbursements for the subsequent phase. The modality of execution by results does not exempt the Executing Agency from compliance with Bank policies in terms of eligibility of expenses and provision of the corresponding required documentation.

IV. COST AND FINANCING

- 4.1 IDB financing for this project – totaling US\$1,498,751 – will come from the Sustainable Energy and Climate Change Multi-Donor Fund. Additional financing of US\$5,753,653 will be made available by the counterpart as an in-kind contribution. Detailed breakdown of the expected in-kind contribution is outlined in Annex II. For the counterpart participation, WJCF-CCI will assure the compliance of the commitments from bus suppliers (special execution condition), bus transit operators, cities and research institutions, according to their involvement per city.³ WJCF-CCI will also participate with partial time

³ The letters of commitment and support from the participating cities represent a condition precedent to the first disbursement of the TC funds. However, the Executing Agency has already fulfilled this condition and the evidence is available in the electronic references.

dedication of its designated professionals as required until the project is formally closed.

SUMMARY COST TABLE

Components	Budget (US\$)		
	SECCI Fund	Counterpart (in-kind)	Total
1. Test Preparation	120,000	0	120,000
2. Test Execution	1,255,971	5,725,933	6,981,904
3. Economic Analysis	41,000	0	41,000
Auditing	10,200	0	10,200
Project Coordinator and Administration	41,580	27,720	69,300
Evaluation	30,000	0	30,000
Total	1,498,751	5,753,653	7,252,404

Note: The estimated costs in components 1 and 2 include contingencies

V. EXECUTING AGENCY

- 5.1 The Executing Agency for the project will be the WJCF-CCI. WJCF-CCI is one of the seven initiatives of the Clinton Foundation, a global 501(c)(3) nongovernmental organization with 1,100 staff and volunteers in more than 40 countries and with offices in the US and other cities around the world. The purpose of WJCF-CCI is to create and advance solutions to the core issues driving CC, by taking a holistic approach, addressing the major sources of GHG emissions and the people, policies, and practices that impact them. Working with governments and businesses around the world, WJCF-CCI focuses on strategic areas, such as advancing carbon-neutral transport technologies. In particular, WJCF-CCI is helping cities to adopt proven and emerging technologies to reduce carbon in their transport sector, looking at vehicles and propulsion systems, fuel options, and fuel distribution and dispensing infrastructure. Providing technology expertise, mobilizing markets, and facilitating financing are some of the objectives WJCF-CCI's Hybrid Bus Test Program aiming to create a market for hybrid bus technology in Latin America.
- 5.2 WJCF-CCI will be a key partner in the execution of this TC given the strategic work the organization is conducting with governments and businesses around the world, in particular with LAC cities helping to adopt low-carbon technologies for their bus transit services. Through this level of engagement and support the WJCF-CCI will be able to provide matching funds, much larger than the IDB-SECCI financing, mainly through direct agreements with bus suppliers.

VI. PROGRAM EXECUTION AND MONITORING

- 6.1 WJCF-CCI is the executing entity, as requested by the participating Latin American cities in the Program. WJCF-CCI will work in collaboration with the IDB through the Transport Division (INE/TSP) and the Sustainable Energy and Climate Change Unit (INE/ECC) of the Infrastructure and Environment Department. INE/TSP will be the technical and basic responsibility unit for the TC. The project team will work closely with the Country Offices in each country in the monitoring and supervision of the TC during the execution phase.

- 6.2 WJCF-CCI will hire or designate a Project Coordinator, who will be financed with resources from the project and will be responsible for: (i) planning the activities included in this TC (ii) contracting with firms or consultants for the works, goods and services to be purchased with the resources of this TC; (iii) monitoring the activities implemented through this TC; and (iv) reporting to the IDB.
- 6.3 The progress and final reports will be the responsibility of WJCF-CCI. The Project Coordinator will submit a progress report at the end of each phase and final report to the IDB within three (3) months after project completion date. The Progress report will include information on: (a) the progress achieved in terms of the targets established herein; and (b) a summary of the problems encountered during the respective period and how they were resolved. An external final evaluation will be contracted by the Executing Agency and financed with the contribution.
- 6.4 Project activities will be executed over 18 months, with disbursement over 21 months.
- 6.5 **Revolving fund.** The Bank may advance up to 20% of the total TC financing proceeds to create a revolving fund. The amount for the revolving fund is justified by the cost of some of the goods, services and consulting contracts, which may amount to as much as 20% of the total financing amount, meaning that 10% would not be enough to make the necessary disbursements.
- 6.6 Standard Bank procedures for auditing, international accounting norms and reporting will be followed. At the end of the project, the Executing Agency will present to the Bank an audit report on the financial statement of the project no later than 90 days after the date of project completion. The audited financial statement report will be prepared by an independent auditor previously accepted by the Bank and will include the audit of cash receipts and disbursements, internal control procedures implemented by the Executing Agency and compliance to Bank procurement procedures. The Project Coordinator will be responsible for managing the project's financial resources. WJCF-CCI will establish and maintain a separate and specific bank account for the purposes of managing this TC
- 6.7 All procurement in the execution of the program will be done in accordance with IDB procurement procedures, as stated in the Policies for selection and contracting of consultants financed by the IDB. GN-2350-7 ("Policies for the Selection and Contracting of Consultants") and GN-2349-7 ("Policies for the Procurement of Works and Goods") of July 2006.

VII. PROGRAM BENEFITS AND RISKS

- 7.1 **Benefits.** The TC will contribute to reducing upfront costs for hybrid bus testing and implementation, long-term market benefits for the acceleration of energy efficient transport in the region including lower costs, development of potential

new industry and production of hybrid bus technologies. This TC will also contribute to the reduction of barriers for technology deployment and will assist local and national institutions in implementation of new clean energy technologies. Several benefits are also expected in relation to private sector participation once the program is designed and implemented. Hybrid buses require several manufacturers to be involved in conducting the tests. In this respect, the participating manufacturers can improve their products, based on the results of the tests, in order to offer the market the best-proven available hybrid technology. The program will also enable technology transfer from the manufacturers to the local bus operators regarding best practices for hybrid bus maintenance and driving cycles. The results of this TC can be replicated and scaled up throughout the region by fostering procurement of hybrid bus technology for many cities and towns where BRTs are in development or where conventional bus fleets are to be replaced or expanded.


- 7.2 **Risks.** The principle risks identified for this TC are: (i) tests do not demonstrate positive results for hybrid buses and uptake is not as expected; (ii) if test results are successful, there may be insufficient funding mechanisms for the long-term purchase of a larger fleet for incorporation in the city's transit system; and (iii) financial/economic analysis shows that it is not feasible for cities to integrate hybrid technology given certain product costs and tariff structures among other factors. These risks will be mitigated through different actions. The purpose of the test is to determine whether the hybrid technology is appropriate for each of these cities. If in some cities the results are not positive, then the city has a solid conclusion. The key will be to ensure the test is run well, so that the results are credible and can be relied on by participating cities and other cities in the region. WJCF-CCI is working with a range of financial players to develop possible mechanisms for funding the incremental cost of hybrid buses, to bring the incremental cost down, and to analyze the life-cycle cost and determine the returns in fuel savings, in order to remove this obstacle. Additionally, the IDB is developing the investment plans for CIF funds in several countries in the region, through which the incremental cost of hybrid buses could be covered. Finally, a key activity of the TC will focus on the macroeconomic aspects of incorporating hybrids into the existing bus systems in each of the cities participating in the test program. This includes funding mechanisms and analysis of fare dynamics, and analysis of requirements or conditions to make this technology feasible in the LAC market.

VIII. ENVIRONMENTAL AND SOCIAL REVIEW

- 8.1 By its nature, the pilot project described under this TC will not have a negative direct environmental or social impact. It is expected to generate high social and economic returns by addressing global and local environmental concerns, such as GHG emissions responsible for CC and air quality problems in the urban areas of the region. Given the nature of this project, based on the limited potential impacts, this TC was classified as category "C" in accordance with the IDB OP-703 policy.

IX. CERTIFICATION

- 9.1 I hereby certify that this operation was approved for financing under the Sustainable Energy and Climate Change Initiative Fund – SECCI (MSC) through the Minutes of Eligibility dated July 29, 2009, and approved by the Eligibility Committee (ECC). Also, I certify that resources from the Sustainable Energy and Climate Change Initiative Fund – SECCI (MSC) are available for up to US\$1,498,751 in order to finance the activities described and budgeted in this document. This certification reserves resources for the referenced project for a period of four (4) calendar months counted from the date of signature below. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this Plan of Operations. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, for which the Fund is not at risk.

 Peter Solli pp
Marguerite S. Berger, Chief
Grants and Cofinancing Management Unit
VPC/GCM

29/ March/ 2010
Date

LOGICAL FRAMEWORK

Objective	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Goal statement (outcome)			
Accelerate significantly the ability for cities to incorporate more fuel efficient, low-carbon buses in their transit systems, thereby greatly reducing CO ₂ emissions.	<ul style="list-style-type: none"> • The cost of hybrid bus technology reduces • A new industry for production of hybrid bus technologies develops to supply large fleets in the cities of the region • Barriers for deployment of low-carbon bus technologies are eliminated or reduced • Cities involved in the program express their interest to adopt hybrid technologies • BRT and conventional operators put purchase orders for hybrid buses • CO₂ emissions in the cities due to transportation experiment reductions related to new low-carbon transport fleets 	<ul style="list-style-type: none"> - Buses market price - Manufacturers reports - WJCF-CCI follow up reports from cities - Cities' expression of interest or BRT TORs with tech specifications - Cities' reports on operators purchases - Cities' reports on fleet emissions changes 	<ul style="list-style-type: none"> • Tests and studies proves the technology to be feasible • Technology additional cost is affordable and covered with specific funds or paid with local funds or tariffs • Bus manufacturers drive bus technology towards this new market
Components (outputs)			
1. Test preparation	<ul style="list-style-type: none"> • Driving cycle development methodology and comparison criteria/model • Final methodology for the test program • Technological, economic and legal benchmarks for the technologies be tested and deployed 	<ul style="list-style-type: none"> - Reports containing the partial and final results of the test preparation, execution and the economic analysis - MOU with legal 	<ul style="list-style-type: none"> • Bus manufacturers produce hybrid buses for the test sake

Objective	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
2. Test execution	<ul style="list-style-type: none"> Operators selected and committed to take responsibility for the bus and the test Driving cycle per city, developed Test teams and equipment in place Buses to test in place Tests completion 	binding signed between WJCF-CCI and operators - Driving cycle team report - Contracts signed - Agreement signed between bus manufacturer and operator - Results comparison among cities	
3. Economic analysis	<ul style="list-style-type: none"> Market forecast for low carbon technologies Technological, economic and legal benchmarks for the uptake of low carbon technologies by cities Barriers solutions in place Information about the test and analysis results disseminated across key stakeholders 	- Reports containing the results of the test preparation, execution and the economic analysis - Expression of interest of cities and National Governments to solve barriers	<ul style="list-style-type: none"> Bus manufacturers provide information to forecast technology prices Barriers solutions can be solved by cities, States or National Governments without mayor law changes

DETAILED PROGRAM BUDGET

Total program cost	Consultant component			Total US
Consultant (honoraries, trips, CCI's in-kind contribution -cities included)	Test and protocols design			\$20,000
	Field coordination and tests follow up			\$100,000
	Program`s macroeconomic analysis			\$41,000
	Project coordinator			\$69,300
	Administrative costs (travel, perdiem, other costs)			\$139,300
Total consultant cost				\$369,600
Test cost structure	Test Component	Bogotá D.C.	Sao Paulo, Rio & Curitiba	
Buses Cost	Cost of Buses	\$1,843,300	\$3,057,600	\$4,900,900
	Import costs	\$73,732	\$0	\$73,732
	Transport related costs	\$102,641	\$65,418	\$168,059
Fuel & Maintenance Cost	Fuel Cost	\$86,236	\$152,770	\$239,006
	Maintenance	\$92,165	\$152,880	\$245,045
Driving cycle development	Professionals	\$3,077	\$14,700	\$17,777
	Field equipment	\$1,500	\$7,500	\$9,000
	Trips and reports	\$2,750	\$13,860	\$16,610
	Contingencies and local overhead	\$2,931	\$14,424	\$17,355
Testing Equipment, Professionals and Field Tests	Professionals and technicians	\$78,025	\$136,643	\$214,668
	Drivers	\$12,000	\$82,500	\$94,500
	Test Equipment	\$150,000	\$150,000	\$300,000
	Instrumentation, small appliances & electronic readings from engines	\$13,200	\$22,200	\$35,400
	Particulate and air emissions analysis	\$40,800	\$136,800	\$177,600
	Logistics, trips, training, reports	\$19,550	\$132,990	\$152,540
	Contingencies and local overhead	\$99,925	\$80,488	\$180,413
Auditing		\$4,200	\$6,000	\$10,200
Evaluation				\$30,000
Total test cost		\$2,621,832	\$4,220,772	\$6,852,804
Total Program Cost				\$7,252,404

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LATAM Hybrid Test Bus Program Costs - Colombia and Brazil (US\$)					
Pilot Regional Program Costs	Program	CCI Contribution (cities included)			SECCI
Consultant component					
<u>Consultant subcomponents cost</u>	<u>\$369,600</u>	<u>\$112,720</u>			<u>\$256,880</u>
Test and protocols design	\$20,000				\$20,000
Field coordination and tests follow up	\$100,000				\$100,000
Program's macroeconomic analysis	\$41,000				\$41,000
Project coordinator	\$69,300	\$27,720			\$41,580
Administrative costs (travel, perdiem, other costs)	\$139,300	\$85,000			\$54,300
Test component	Program	Colombia (Bogota)	Brazil	CCI (manufacturers & cities included)	SECCI
<u>Bus Costs</u>	<u>\$5,142,691</u>	<u>\$4,900,900</u>			<u>\$241,791</u>
Baseline diesel bus	\$1,254,000	\$377,000	\$877,000	\$1,254,000	\$0
Hybrid bus	\$3,646,900	\$1,466,300	\$2,180,600	\$3,646,900	\$0
Import & export (if required)	\$73,732	\$73,732	-	-	\$73,732
Transport related	\$168,059	\$102,641	65,418	-	\$168,059
<u>Fuel & Maintenance Cost</u>	<u>\$484,051</u>	<u>\$440,933</u>			<u>\$43,118</u>
Fuel	\$239,006	\$86,236	\$152,770	195,888	\$43,118
Maintenance	\$245,045	\$92,165	\$152,880	245,045	\$0
<u>Driving Cycle Development</u>	<u>\$60,742</u>	<u>\$0</u>			<u>\$60,742</u>
Professionals	\$17,777	\$3,077	\$14,700	0	\$17,777
Field equipment (GPS, data loggers) and field work	\$9,000	\$1,500	\$7,500	0	\$9,000
Trips and reports	\$16,610	\$2,750	\$13,860	0	\$16,610
Contingencies and local overhead	\$17,355	\$2,931	\$14,424	0	\$17,355
<u>Equipment, Professionals, Field Tests</u>	<u>\$1,185,120</u>	<u>\$299,100</u>			<u>\$886,020</u>
Professionals and technicians	\$214,668	\$78,025	\$136,643	30,000	\$184,668
Drivers	\$94,500	\$12,000	\$82,500	31,800	\$62,700
Test Equipment	\$300,000	\$150,000	\$150,000	200,000	\$100,000
Instrumentation, small appliances & electronic readings from engines	\$35,400	\$13,200	\$22,200	-	\$35,400
Particulate and exhaust emissions analysis	\$177,600	\$40,800	\$136,800	-	\$177,600
Logistics, trips, training, reports	\$152,540	\$19,550	\$132,990	37,300	\$115,240
Contingencies and local overhead	\$210,413	\$114,925	\$95,488	0	\$210,413
<u>Auditing</u>	<u>\$10,200</u>	<u>\$0</u>			<u>\$10,200</u>
Auditing	\$10,200	\$4,200	\$6,000		\$10,200
<u>Evaluation</u>	<u>\$30,000</u>	<u>\$0</u>			<u>\$30,000</u>
Evaluation	\$30,000				\$30,300
<u>TOTAL PROGRAM COSTS</u>	<u>\$ 7,252,404</u>	<u>\$ 2,641,032</u>	<u>\$ 4,241,772</u>	<u>\$5,753,653</u>	<u>\$1,498,751</u>
<u>Contribution</u>				79%	21%

General Hybrid Buses Regional Program Test Components	Total Cost	IN-KIND contribution sources				
		Suppliers % CCI	Rio Suggested Contributor	Sao Paulo Suggested Contributor	Curitiba Suggested Contributor	Bogotá Suggested Contributor
Consultant component	\$369,600					
Test and protocols design	\$20,000					
Program coordination and tests follow up	\$100,000					
Program macroeconomic analysis	\$41,000					
Administrative costs (travel, perdiem, other costs)	\$69,300		City CCI	City CCI	City CCI	City CCI
General Hybrid Buses Test Components	Total Cost					
Cost of Buses	\$4,900,900					
- Baseline Diesel 12 m buses		\$3,646,900	Operator/Transport Authority			Operator
- Series 12 m buses						
- Parallel 12 m buses						
- Baseline Diesel 18 m buses				Operator/Transport Authority	URBS/Transit Authority	Operator
- Series 18 m buses						
- Parallel 18 m buses						
Import costs 1/	\$73,732					
Transport related costs 2/	\$168,059					
- Import, export: procedures			Operator/Transport Authority	Operator/Transport Authority	URBS/Transit Authority	Operator/Trans Milenio
- Local						
Fuel Cost	\$239,006		Operator/Transport Authority	Operator/Transport Authority	URBS/Transit Authority	Operator/Trans Milenio
Maintenance	\$245,045	\$122,523	Operator	Operator	Operator	Operator
Driving cycle development	\$44,132					
- Professional team			University	IPT/Transit Authority	URBS/Transit Authority	University
- Field work			University	IPT/Transit Authority	URBS/Transit Authority	University
- Contingencies & administrative costs						
Test, equipment, professionals, field	\$786,768					
- Professional and technical team: Mechanic			Operator	Operator/Transport Authority	URBS/Transit Authority	Operator/Trans Milenio
- Drivers			Operator	Operator/Transport Authority	URBS/Transit Authority	Operator/Trans Milenio

		IPT/Transit Authority				University
<ul style="list-style-type: none"> - Test equipment - Field tests (type A: simulated load; & type B: with passengers) 						
Logistics, trips, training, reports <ul style="list-style-type: none"> - Support vehicles - Trips - Parking - Driving and mechanic training - Reports 	\$152,540	Transport Authority	Transport Authority	URBS/Transit Authority	TransMilenio	
		Operator/Transport Authority	Operator/Transport Authority	URBS/Transit Authority	Operator/TransMilenio	
		Operator/Transport Authority	Operator/Transport Authority	URBS/Transit Authority	Operator/TransMilenio	
Administrative costs for the test	\$180,413					
- Contingencies and overhead costs						
Total test	\$6,852,804					
Total Regional Hybrid Program	\$7,252,404	\$3,769,423				

All amounts are denominated in US Dollars

PROCUREMENT PLAN

I. GENERAL INFORMATION

Country: Brazil and Colombia
Executing Agency: Clinton Climate Initiative, a program of the William J. Clinton Foundation
Estimated date of the Plan's approval: February, 2010
Estimated date of the final disbursement: November, 2011
Period included in this Procurement Plan: February, 2010 to August, 2011

Ref. No. ¹	Description and type of the procurement contract	Estimated Contract Cost (US\$000)	Procurement method ²	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification ³ (Yes/No)	Estimated dates		Status ⁴ (pending, in process, awarded, cancelled)	Comments
					IDB (SECCI) %	Local/ Other %		Publication of specific procurement notice	Completion of contract		

¹ If a number of similar individual contracts were to be executed in different places or at different times, these can be grouped together under a single heading, with an explanation in the comments column indicating the average individual contract amount and the period during which they would be executed. For example, an education project that includes school construction might include an item "school construction" for a total of US\$20 million, and an explanation in the comments column such as: "This encompasses some 200 contracts for school construction averaging US\$100,000 each, to be awarded individually by participating municipal governments over a three-year period between January 2006 and December 2008."

² **Goods and Works:** ICB: International competitive bidding; LIB: limited international bidding; NCB: national competitive bidding; PC: price comparison; DC: direct contracting; FA: force account; PSA: Procurement through Specialized Agencies; PA: Procurement Agents; IA: Inspection Agents; PLFI: Procurement in Loans to Financial Intermediaries; BOO/BOT/BOOT: Build, Own, Operate/Build, Operate, Transfer/Build, Own, Operate, Transfer; PBP: Performance-Based Procurement; PLGB: Procurement under Loans Guaranteed by the Bank; PCP: Community participation procurement. **Consulting Firms:** QCBS: Quality- and Cost-Based Selection QBS: Quality-Based Selection FBS: Selection under a Fixed Budget; LCS: Least-Cost Selection; CQS: Selection based on the Consultants' Qualifications; SSS: Single-Source Selection. **Individual Consultants:** NICQ: National Individual Consultant selection based on Qualifications; IICC: International Individual Consultant selection based on Qualifications

³ In the case of new Policies it applies only for Goods and Works. In the case Old Procurement Policies it applies for Goods, Works and Consulting Services.

⁴ This column "Status" should be used for retroactive procurement and for procurement plan updates.

Ref. No. ¹	Description and type of the procurement contract	Estimated Contract Cost (US\$000)	Procurement method ²	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification ³ (Yes/No)	Estimated dates		Status ⁴ (pending, in process, awarded, cancelled)	Comments
					IDB (SECCI) %	Local/ Other %		Publication of specific procurement notice	Completion of contract		
	1. <u>Goods</u> ○ Instrumentation, small appliances and electronic readings from engines <u>Brief description:</u> Specific appliances to capture gases, filters, wiring and electronic materials required to complete and install equipment; computers, data loggers, software, cables, batteries	35.4	PC	Ex post	100		No	May 2010	August 2010	pending	
	○ Test equipment <u>Brief description:</u> equipment includes exhaust gas dilution system, mass flow meter, real time particulate matter measurement, real time exhaust gas concentration, batteries, power plant	100	PC	Ex post	100		No	May 2010	August 2010	pending	
	○ Field equipment and field work <u>Brief description:</u> GPS, data capturing appliances plus software, connections and GPS service, for driving cycle development	9.0	PC	Ex post	100		No	May 2010	August 2010	pending	
	○ Fuel <u>Brief description:</u> Part of the supply required for the test	239	DC	Ex post	18	82	No	September 2010	December 2011	pending	

2. Non-consulting services	○ Import & export costs for testing buses <u>Brief description:</u> insurance policies, loading and unloading, storage fees, non-taxes administrative costs. Several agreements will take place; export will take place when no good results	73.7	PSA	Ex post	100	0	No	n.a.	September 2010	pending	
	○ Transport related costs <u>Brief description:</u> freight costs for sea and land transportation of testing buses. Several activities will take place	168.1	PSA	Ex post	100	0	No	n.a.	September 2010	pending	
	○ Administrative costs (consultant services) <u>Brief description:</u> air tickets, ground transportation, hotels, local support, studies, for all consultant services	54.3	PC	Ex post	39	61	No	n.a.	September 2010	pending	
	○ Logistics, trips, travel expenses and reports <u>Brief description:</u> local transportation support, air tickets and travel stipends for the professional team responsible for tests implementation, parking, training, report production	131.9	PSA	Ex post	78	22	No	n.a.	November 2010	pending	
	○ Particulate and exhaust emission analysis <u>Brief description:</u> laboratory analysis of samples from exhaust gas emissions	177.6	PSA	Ex post	1009	0	No	n.a.	November 2010	pending	
	○ Maintenance <u>Brief description:</u> Current activity in charge of bus operators and suppliers	245	DC	Ex post	0	100	No	n.a.	December 2011	pending	

3. Consulting services Consultoría para estructurar a nivel de factibilidad y realizar acompañamiento al programa de pruebas de buses híbridos en LATAM		161	IICC	Ex-ante	100	0	no	n.a.	May 2010	pending	
	o Field work professional services <u>Brief description:</u> international and national professional , technical group in charge of field test implementation, data analysis and results reporting, and drivers	327	IICC & DC	Ex post	81	19	No	n.a.	October 2010	Pending	
	o Project coordinator <u>Brief description:</u> Person responsible for (i) planning the TC activities; (ii) contracting works, goods and services; (iii) monitoring activities; and (iv) reporting to the Bank	69	DC	Ex post	60	40	No	n.a.	February 2010	pending	
	o Auditing <u>Brief description:</u> Independent audit report on the financial statement of the project	10.2	IICC	Ex post	100	0		n.a.	December 2011	pending	
	o Evaluation <u>Brief description:</u> consulting services hired by the Bank to conduct the final evaluation of the Program	30.0	IICC	n.a.	100	0		n.a.	March 2010	pending	