
# Reducing Greenhouse Gas Emissions with Bus Rapid Transit: a GEF Medium-sized Project Brief

**14 July 2004**

UNEP

ITDP
Institute for Transportation & Development Policy

# Reducing Greenhouse Gas Emissions with Bus Rapid Transit: a GEF Medium-sized Project Brief

**Table of contents**

Cover photo: Bogota, Colombia, photo courtesy of Shreya Gadepalli, ITDP

**List of abbreviations**

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| AALOCOM | Association for the Advancement of Low-Cost Mobility |
| BRT | Bus Rapid Transit |
| CAI | Clean Air Initiative |
| CDM | Clean Development Mechanism |
| $CO_2$ | carbon dioxide |
| DCC | Dar es Salaam City Council |
| EF | Energy Foundation |
| GEF | Global Environment Facility |
| GHG | greenhouse gases |
| GTZ | German Overseas Technical Cooperation Agency |
| I-CE | Interface for Cycling Expertise |
| IPCC | Inter-Governmental Panel on Climate Change |
| ITDP | Institute for Transportation and Development Policy |
| JICA | Japenese International Cooperation Agency |
| km | kilometre |
| NGO | non-government organisation |
| NMT | non-motorized transportation |
| NO2 | nitrogen dioxide |
| OP | Operational Program (GEF) |
| PCFV | Partnership for Clean Fuels and Vehicles |
| SUTP-Asia | Sustainable Urban Transport Project - Asia |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| US AID | United States Agency for International Development |
| US EPA | United States Environmental Protection Agency |

## 1. PROJECT SUMMARY

| PROJECT IDENTIFIERS | |
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| **1.1. Project name:**<br>Reducing Greenhouse Gas Emissions with Bus Rapid Transit and Non-Motorized Transport | **1.2. GEF Implementing Agency:**<br>United Nations Environment Programme |
| **1.3. Country or countries in which the project is being implemented:**<br>Project is multi-country. The Bus Rapid Transit demonstration project will take place in Dar es Salaam, Tanzania; and the Non-Motorized Transport Feeder System to Bus Rapid Transit will take place in Cartagena, Colombia. | **1.4. Country eligibility:**<br>Tanzania ratified the UNFCCC on 17-Apr-96<br>Colombia ratified the UNFCCC on 22-Mar-95 |
| **1.5. GEF focal area(s):**<br>Climate change | **1.6. Operational program/Short-term measure:**<br>OP 11: Promoting Environmentally Sustainable Transport<br>This project will particularly address the priority measure highlighted in 11.10(a) of OP 11: "Modal shifts to more efficient and less polluting forms of public and freight transport." Additionally, the project will promote integrated transport solutions with other motorized and non-motorized options, and thus also address 11.10(b) of OP 11: "Non-motorized transport." See further Section 2.1.2 'eligibility for GEF funding'. |

### 1.7. Project linkage to national priorities, action plans, and programs:

#### 1.7.1. National priorities, action plans and programs in Tanzania

Dar es Salaam is on track to be the first city in Africa to have a fully integrated Bus Rapid Transit (BRT) and non-motorized transport (NMT) system. The National Government, the Mayor, and the City Council are all on record announcing their plan to implement the BRT system. After funding from the UNEP PDF.A. Grant for this project, matched with support from the W. Alton Jones Foundation, three workshops on BRT and NMT were held in Dar es Salaam. These built on the earlier Sustainable Dar es Salaam Project, a joint UN-Habitat / UNEP project which led to the development of the Dar es Salaam Strategic Urban Development Plan. Dar es Salaam City Council was also familiar with the importance of Non-Motorized Transport, and had implemented some successful pilot projects under the World Bank's Sub-Sahara Africa Transport Program from 1995 to 2000. The Vice-President's Office on 9th July 2002 stated that after consultation with the President's Office – Regional Administration and Local Government (a national ministry), they support the implementation of the BRT project because it conforms to national development objectives as articulated in the National Transport Policy (NTP). Implementation of the NTP in Dar es Salaam City is the responsibility of the Dar es Salaam City Council and its three Municipalities. The City Council established three development priorities – one of which was implementing Bus Rapid Transit. In January of 2003, the City Council funded a visit by the Lord Mayor and 12 other decision makers and technical experts to Bogota, Colombia, organized by the Institute for Transportation and Development Policy (ITDP). After the visit, the Lord Mayor, City Director and members of the City Council on 14th May 2003 in official Council session stated their commitment to implementing the BRT project. On 4tth July 2003 the Minister of Communications and Transport presented the BRT project to the National Parliament, which endorsed the project.

The National Government and the City Council, with ITDP, then approached the UNEP GEF to support the project. The City Council approved in 2004 the allocation of $350,000 to begin planning the system. In

April, 2004, ITDP brought Lord Mayor Sykes to the World Bank, where World Bank support was secured for dedicating roughly $1 million for the detailed engineering of the first BRT corridor from the Central Corridor Transport Project of the World Bank (Credit #CR8888-TA; see Appendix 6). On ITDP's recommendation, the World Bank hired Dario Hidalgo of Akiris (former Deputy Director of TransMilenio in Bogota), to draft the Terms of Reference. The Request for Proposals and Statement of Interest was issued by the Dar es Salaam City Council in June of 2004. Potentially, $20 million of World Bank funds under the same loan package are available for implementation. In June of 2004, US AID, through ITDP, agreed to provide $100,000 to assist the Dar City Council with the BRT project-related capacity building.

On 16 June 2004 the project was formally launched. The Project Management Unit was established in City Hall, and a British-trained Tanzanian project leader, Raymond Mbilinyi, was hired. A steering committee for the BRT Project was formed by the Mayor of the City (chair person), and including the Dar es Salaam City Director, the Mayors of Dar es Salaam Municipalities (Ilala, Kinondon and Temeke), the Municipal Directors, the Director of Surface Transport (Ministry of Communications and Transport), the Managing Director of TANROADS, the Manager of the Road Fund Board, the Director of Environment (Vice Presidents Office), the Dar es Salaam Region Administrative Secretary, the Commissioner of Budget (Ministry of Finance), the Director of Local Government (Presidents Office, Regional Administration and Local Government), and the Executive Secretary of the Association for Advancing Low Cost Mobility (NGO). These will nominate a 3 member technical committee for follow up and approval of study reports. The secretary of the technical committee will be the manager of the BRT Project Management Unit. ITDP, which participated in the structuring of the project, is a technical advisor to the Project Management Unit. ITDP's relations with Dar es Salaam City Council and the Lord Mayor are governed by a memorandum of understanding which obligates ITDP to spend funds from US AID and the UNEP GEF on the items stipulated in the budgets for these grant agreements.

In June 30, 2004, bids for implementing the RFP from the World Bank were received and full proposals will be requested from a shortlist of 6 identified by August, 2004. The TOR under the World Bank loan is for the physical planning and detailed engineering of the first BRT corridor, but does not include funds for the business plan for the BRT system, for the structuring and drafting of the contracts for the regulatory authority, for the operators, the feeders, and the ticketing system, nor for the procurement of traffic modeling software by the project unit, nor for training of the staff, nor for the detailed design of pedestrian and cycling facilities in the corridor. It was decided to approach the GEF for these critical inputs into the project.

### 1.7.2. National priorities, action plans and programs in Colombia

In February 2002 the municipality of Cartagena, with the assistance of ITDP and the German Technical Cooperation (GTZ) hosted an international seminar on sustainable transport options. Building on capacity development efforts there by JICA (OD matrix completed in 1992, now out of date) and UNDP (transport sector capacity building), and a successful *permanent* pedestrianization of the historical core of Cartagena, in March 2002 the Municipality of Cartagena published its vision statement for a sustainable transport future, strongly linking accessibility to development and poverty eradication. The document, *Movilidad Para Todos* (Mobility for All), sets out the municipality's investment and planning priorities. These priorities include the development of:

- A more prosperous, competitive, sustainable and equitable urban centre by permanent pedestrianisation and urban regeneration efforts;
- Pedestrian corridors throughout the city that will allow all segments of society to comfortably and cost-effectively reach economic opportunities, mass transit facilities, and public services;
- A bicycle network that will integrate with other transport modes and provide full coverage to major destinations such as businesses and schools; and,
- A Bus Rapid Transit system that will provide a low-cost, quality transit service to all income sectors.

After this plan was approved, the Mayor's office contracted BRT experts Logit from Brazil to prepare a BRT Plan. This plan envisioned a 25.75 km BRT system to be built in two phases, the first being 12km. Cartagena submitted these preliminary plans to the National Government, and the National Government then included the implementation of this BRT system in its negotiations with the World Bank for its Integrated Mass Transit Systems Loan, which was signed in June of 2004. The IBRD has committed $46.7 million for the implementation of the first 12km BRT system, and the municipality has committed an additional $35.3 million in matching funds.

The Municipality of Cartagena, however, has not completed the necessary detailed designs for their BRT system, and the current plans, developed under the previous Mayor, lacked a comprehensive design for pedestrians and bicycle facilities both inside the bus corridor and as a feeder to the corridor. The

Municipality approached ITDP and the UNEP GEF to fund these activities to complement and improve the design. The use of NMT as a feeder system was not developed in Bogota and is now being retrofitted into the system.

## 1.8. GEF national operational focal point and date of country endorsement:

Tanzania: Permanent Secretary, Vice-President's Office, endorsed 9 July 2002 (see Appendix 1)

Colombia: Ministry of Environment, 10 October 2002 (see Appendix 1)

PROJECT OBJECTIVES AND ACTIVITIES

## 1.9. Project rationale and objectives:

An increasing body of evidence indicates that Bus Rapid Transit (BRT) systems coupled with Non-Motorized Transport (NMT) facilities as feeder systems are the only way to check the rapid growth of private motor vehicle use and related CO2 and other emissions. While BRT systems are spreading rapidly in Latin America, and beginning in Asia, thus far there are no BRT systems in Africa. Furthermore, those BRT systems that have been developed (Bogota, Curitiba, Quito) have either ignored bicycling altogether or have developed parallel cycling facilities that are not built as part of a planned feeder system for the BRT system. One of Bogota Mayor Penalosa's greatest regrets was that he did not design cycling facilities as a feeder system to TransMilenio.

Thanks to work funded under the PDF.A. for this project, there is now firm political commitment to building a BRT system in Dar es Salaam, Tanzania. It is likely that this will be the first BRT system in Africa. (Cape Town, Dakar and Accra are also developing projects.)

Dar es Salaam, a city of over 3.2 million residents, has a fleet of private motor vehicles and minibuses that is growing faster than the 4% annual GDP growth rate. The vast majority of trips in Dar are concentrated on the central business district (CBD). Only 4 arterials and one 2-lane road feed the over 500,000 daily transit passengers entering the CBD, and these roads are heavily

Indicators:

1. Crudely estimated, the Dar es Salaam 10km BRT pilot project should bring about a stabilization of modal split at 2004 levels. An estimated 24,000 daily passengers currently using private modes of transport will switch to less polluting (per trip) large buses, (because the trip will be much faster). Roughly 242,000 daily bus trips which are currently undertaken using minibuses and microbuses will instead use a smaller number of cleaner BRT buses. Combined, this should lead to a reduction of 430,000 metric tons of CO2 emissions in the first year over baseline emissions projections, and a reduction of 1,119,000 metric tons of CO2 by the fifth year of operation. (See Appendix 5)
2. While full traffic analysis is not yet completed, the target for Cartagena for the first year after implementation the integrated NMT/BRT system is to slightly reduce the current modal split of 22% private motor vehicles and taxis to 19% (most reduction from taxis), to increase bike use from less than 1% to perhaps 3%, and 78% bus use would fall marginally, to 77% (as some passengers switch to much cheaper bicycles). A very crude estimate of roughly 63,000 metric tons of $CO_2$ emissions reduced per year in Cartagena is reasonable after the first year.[1]
3. The cost of BRT and NMT planning will be cut by 50% for future BRT lines in the project cities, and for all the cities likely to utilize the BRT Planning Guide where ITDP and affiliated partner

[1] . This figure is based on the emissions benefits observed in TransMilenio per kilometre of BRT line and multiplying by the number of km of BRT planned in Cartagena. This crude technique was used for lack of more recent Household survey data. Distortions should be less problematic in the case of Cartagena as the vehicle fleet in Cartagena and Bogota are similar.

Analysis indicates that if CNG buses rather than diesel buses are used, the additional CO2 benefits are essentially zero, but other emissions like particulates and SO2 may drop substantially. Hybrids and other bus types were deemed too expensive to be economically viable in the context of either Dar es Salaam or Cartagena.

The methodologies set forth by the IPCC revised 1996 GHG guides give countries a methodology for estimating their current and future likely GHG emissions from transport under a fairly limited set of scenarios, none of which address the issue of modal shift. As such, they provided limited guidance for quantifying the CO2 emissions impacts of an OP11 program focused on modal shift impacts.

congested with private vehicles and about 7,000 minibuses (16-seater Toyota Hiaces) and medium sized buses (30 seater Isuzus). If this project does not go forward, the estimated increase over current CO2 emissions levels by 2010 will be 1,474,000 metric tons, an increase of 50%, due mainly to rapid motorization and continued decline in public transit use.

A total 100km BRT trunk system with 200km of feeder lines is envisioned for the Dar BRT system. Under Phase I, 10km will be completed on Morogoro Road, which handles roughly 270,000 daily trips to and from the CBD. CO2 and other emissions reductions will result from a shift of passengers from private vehicles to buses, and from a large number of polluting small buses to a smaller number of less polluting larger buses.

Meanwhile, Cartagena offers a first Latin American opportunity to design a BRT system with an NMT feeder system planned into it from the inception. Cartagena, a thriving tourist centre, has recently pedestrianized its historical centre. It also has an extensive coastline. This offers a unique opportunity for developing a pedestrian/cycling network as part of an integrated NMT- BRT project.

Cartagena has over one million inhabitants concentrated in an extremely dense urban area. Motorized trips are heavily concentrated on two major arterials connecting residential zones to the downtown. A large population of low-income settlements are clustered along the shoreline. An exclusive bicycling and pedestrian facility (a boardwalk) along the waterfront could not only serve as a feeder to the BRT line, it could also dramatically increase cycling trips to the downtown, taking pressure off the two arterials.

In both cities, activities under the PDF.A. by ITDP in cooperation with the municipal governments have leveraged support from other sources. In Dar es Salaam, in addition to municipal resources, the national government with a loan from the World Bank has committed to fund detailed engineering of the first BRT corridor and possibly for the implementation as well under its Central Corridor Transport Project. US AID has also agreed to finance part of the capacity building related to the BRT/NMT project. In Cartagena, the infrastructure will be paid for in the recently approved World Bank Integrated Mass Transit Systems Project for Colombia, which includes Cartagena.

organizations have ongoing BRT projects. The cities directly affected will be Dakar, Accra, Nairobi, Kampala, Cape Town, Delhi, Jakarta, Dhaka, Hyderabad, and Mexico City.[2] This will yield a savings of roughly $1 million per city, or $10 million. Assuming the savings are spent on BRT systems, this is roughly 10 km of BRT and 50 km of NMT facilities, the benefit of which is conservatively estimated at 30,000 metric tons of $CO_2$ emission reduction per year, increasing into the future. These other systems are being developed with members of this project team but with funds from other sources, (US AID, UNDP GEF, and the participating governments).

4. The BRT Planning Guide and the project experience on BRT in Africa and on NMT/BRT integration in Latin America will be disseminated through the Sustran – Africa network, Sustran-Asia, the Clean Air Initiative in Asian Cities, the Transportation Research Board, CODATU, CLAPTU, EASTS, and similar forums.

[2] ITDP is currently also working on BRT/NMT projects in Jakarta, Delhi, Hyderabad, Accra, Cape Town, and Dakar. ITDP in cooperation with Logit is assisting the Beijing Energy Foundation with BRT projects in Beijing, Chengdu, and Kunming. ITDP in cooperation with Embarq and Logit is assisting in NMT/BRT integration in Mexico City. GTZ, a co-financer of the project, is working on a preliminary BRT project in Bangkok. The World Bank and members of the Clean Air Initiative are working on BRT projects in Hanoi, Shijiazhuang, Dhaka, Santiago, Lima, and multiple cities in Colombia.

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| However, in both cities, the detailed planning of the systems is not yet completed, nor is local capacity sufficient to absorb the technical support of international experts in a sustainable manner. If poorly designed, these BRT projects could have minimal positive environmental impacts.<br><br>In the Dar es Salaam project, local expertise will be partnered with experts from Bogota, Sao Paulo, and from other countries, in a largely south-south partnership facilitated by ITDP. These experts will focus on local capacity building and on the institutional, legal, and financial structures critical to BRT success, while the planning and engineering will be done under the auspices of the World Bank loan.<br><br>In Cartagena, Colombia, the world's leading bicycle and pedestrian facilities experts from Bogota, Holland, and the US will collaborate to complete the BRT/NMT integrated plan developed by the Municipality for implementation by the World Bank funds.<br><br>The Brazilian, Colombian, and US experts cooperating in this project have experience working on numerous BRT and NMT projects around the world. ITDP, Logit, Steer Davies Gleave, Akiris, and Jarko Vlasak and Co. have collectively worked on or are working on BRT projects in Bogota, Sao Paulo, Jakarta, Delhi, Dakar, Accra, Cape Town, Chengdu, Leon, and numerous other cities in earlier stages of project development. After these projects end, expansion of the BRT and NMT systems as these cities grow depends on local governments. It is therefore crucial that local capacity be built. Each of these local governments, as well as numerous other local governments exploring the possibility of BRT or NMT, have asked us to help document the BRT/NMT planning process as a reference guide.<br><br>As some of the world's leading experts will be working on this project together anyway, and as this will be the first BRT system designed in Africa, the team decided it should also take the opportunity to document the step-by-step process for planning and designing integrated BRT-NMT systems in an African context so that in the future municipalities can use these guidelines with less reliance on expensive international experts.<br><br>To design a highway, virtually all traffic engineers the world around rely on the US-based Highway Capacity Design Manual. This manual became an authoritative guide for all traffic planners the world around. While this has led to some inappropriate use of first-world design standards in radically different developing country contexts, it at least mitigated against basic poorly planned roads.<br><br>Currently, there is no similar manual for BRT. As a | |

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| result, there is no authoritative guidance for municipalities that want to design a BRT system on their own, nor a resource that could be used to avoid serious planning mistakes.<br><br>As such, we decided to use this project to also develop a BRT Planning Guide, building on some of the excellent work already done by Lloyd Wright under the auspices of GTZ. The Hewlett Foundation has agreed to provide the vast majority of the funding for this element of the project ($215,000), but additional resources from the GEF would allow us to document many of the more technically complex elements of BRT system design such as traffic modeling, legal issues, financial planning, etc.<br><br>The BRT Planning Guide will be released in several versions, the first version within one year of project inception, so that the lessons can be immediately transferred to the other cities mentioned above currently actively developing BRT projects. | |
| **1.10. Project outcomes (changes generated by the project):**<br><br>1. Dar es Salaam and Cartagena will complete the planning and design for full BRT networks and NMT feeder systems.<br><br>Dar es Salaam and Cartagena will implement the first corridor and feeder system. In the process, these cities will develop the in-house technical capacity to implement, expand, and maintain this BRT and NMT system on their own, expanding these systems indefinitely, decreasing the per person GHG emissions generated by their population's daily transport needs into perpetuity.<br><br>Latin American cities, which have expertise with BRT systems but lack successful models of integrating NMT facilities with their BRT systems, will learn from the Cartagena project how to use the development of bike/pedestrian-only infrastructure as pollution free and desirable feeder systems. These lessons on NMT integration with existing and developing BRT systems will be spread first to Brazilian and Mexican Cities. BRT/NMT linkages will be disseminated to Mexico and Brazil as a result of ITDP involvement in BRT and NMT in those cities with support from Hewlett.<br><br>The experience in Dar es Salaam, a key East African city, will induce the development of similar demonstration projects elsewhere in East Africa. The experience will most immediately be spread to likely BRT projects already being discussed in Nairobi, Kenya, and Kampala, Uganda, but also expressing interest are Kigali, Rwanda; Lusaka, | Indicators:<br><br>1. BRT plans will be completed with the funds identified for implementation within 18 months of commencement of the project.<br><br>In Dar es Salaam approximately 10 km of trunk lines and 100 km of feeder lines will be implemented, forming the BRT system, along with 30 km of integrated non-motorized transport feeder systems. In Cartagena 12 km of trunk lines and approximately 120 km of feeder lines will be implemented, forming the BRT system, along with approximately 15 km of integrated non-motorized transport feeder systems. In both cities all of these facilities will be built during the five years of the project, with funding secured from non-GEF sources.<br><br>These two cities directly involved in the project will have already budgeted, planned and designed at minimum a doubling of this network within three years after project termination.<br><br>The lessons learned from NMT/public transit linkages in Cartagena will be directly incorporated into NMT access projects implemented by the end of the 5th year of project implementation in at least Mexico City, Rio de Janeiro, and Sao Paulo, where the project team has resources from the Hewlett Foundation.<br><br>At least 5 Latin American experts involved with the project with NMT/BRT integration experience will work on other projects around Latin America, by the end of the 3rd year of project implementation.<br><br>The lessons learned from BRT system development in Dar es Salaam will be directly used in the |

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| Zambia; Lagos, Nigeria; and Maputo, Mozambique.<br><br>Local officials and experts will become a generation of BRT professionals with Africa specific expertise.<br><br>The project-specific experience in Dar es Salaam and Cartagena will be incorporated directly into the development of the BRT Planning Guide, along with the participation of other cities working on BRT. This Planning Guide will directly reduce the cost of BRT and NMT planning for those cities which use it, and ensure the development of better quality systems with a greater GHG emission reduction impact.<br><br>Regional replication of successful BRT and BRT/NMT integration will be promoted through the dissemination of project successes in complementary efforts, such as Sustran-Africa, Sustran-Asia, and the Clean Air Initiative. Dar es Salaam will serve as a first BRT effort in the specific East African context.<br><br>South-to-South technology exchange between successful projects in Latin America and other regions will be developed. | development of at least one other African BRT system, most likely in Dakar, Accra, Nairobi or Kampala, by the end of the 5th year of project implementation.<br><br>At least 3 African experts involved with the project with NMT/BRT integration experience will work on other projects around Africa, by the end of the 5th year of project implementation.<br><br>The cities and their designated technical experts mentioned in footnote 1 will be given the BRT Planning Guide. This will help them expand their own systems and reduce their initial planning costs by as much as 50%, completing BRT Network and NMT facilities master plans for under $2 million each, and using the money saved to expand their BRT and NMT systems, within two years of project completion.<br><br>At least 5 Latin American experts involved with the project with NMT/BRT integration experience will work on other NMT/BRT integration projects by the end of the 3rd year of project implementation. |
| **1.11. Project activities to achieve outcomes:**<br><br>**1. Dar es Salaam BRT Project**<br><br>The Dar es Salaam BRT project is a big project involving more than one funding source covering different aspect of the system's design and implementation. The breakdown is as follows:<br><br>o Basic data collection and traffic modeling.<br><br>ITDP, with US AID funds, has already begun this process. The GEF funds will support further capacity building within the municipality. Most of the detailed scenario modeling will be done under the World Bank contract.<br><br>o Detailed physical design and engineering<br><br>This will be done entirely under the auspices of the World Bank loan.<br><br>o Operational Plan<br><br>This determines detailed bus routing changes in the new system.<br><br>o Socialization and Promotion among Stakeholders<br><br>This will be done primarily by the Municipality, with some involvement of ITDP funded by US AID. Most important is the public relations campaign and the involvement of the existing bus operators.<br><br>o Legal Work, Institutional Structure, | Indicators:<br><br>1. Dar es Salaam BRT Project (source of intl. funding)<br><br>o Traffic Modeling of the full Dar es Salaam BRT system completed. Demand estimates for each corridor under different pricing and design scenarios completed. (World Bank)<br>o Detailed physical design and engineering completed. (World Bank)<br>o Operational Plan completed. (World Bank)<br>o Six Stakeholder Meetings Held (AID)<br>o Six Press Conferences Held (AID)<br>o Financial Feasibility Study Completed (GEF)<br>o Business Plan completed (GEF)<br>o Technical specifications for all procurement completed. (GEF)<br>o Legislative changes required for completing the BRT authority completed and approved. (GEF)<br>o Regulatory changes required for compliance with the financial feasibility study completed. (GEF)<br>o Tendering documents and contracts for trunk line operators, feeder operators, ticketing system operator, and construction contracts completed. (GEF)<br>o Bicycling and Pedestrian Master Plan Completed (GEF for Ped/I-CE for bike) |

Financial Feasibility Plan, Regulatory Structure, Procurement Plans

This interrelated work was left for the UNEP GEF grant to pick up, so it will be explained in greater detail. In TransMilenio it was handled by McKinsey and a Colombian law firm. In this project, it will be done by Akiris or Vlasak & Co. based on competitive tender.

A BRT system, when done properly, generally requires several legal and regulatory changes. First, the regulatory authority, (TransMilenio in Bogota or Urbis in Curitiba) has to be created, and its powers assigned. Secondly, the route licenses for the existing operators have to be changed in a way that ensures the system will be profitable. Thirdly, the contracts for the bus operators, the feeder operators, and the ticketing system operator all have to be drawn up and bid competitively. The responsibility for procurement is generally put on the bidders, but following technical specifications drawn up by the project team from a list of eligible suppliers. The success or failure of a BRT system frequently is determined by getting this process right.

- Integration with bicycle and pedestrian infrastructure

Designing proper bicycle and pedestrian infrastructure as a feeder system to the BRT system is critical to the project's success. The Interface for Cycling Expertise will cover the bicycling elements of this project. The pedestrian infrastructure planning will be done by ITDP expert Michael King or Michael Molle or Jackson Wandres with funds from the UNEP GEF grant.

[Cost for Dar es Salaam: $2,390,121, of which GEF $489,445]

**2. BRT with NMT Feeder System for Cartagena, Colombia.**

The preliminary planning work for the Cartagena BRT project has already been completed by studies funded by the Municipality and done by Logit and partners. The following still needs to be done.

- Operational Plan

The operational plan is crucial for the system's success. A preliminary study has been carried out, but it needs to be adjusted based on the final design and financial study. This will be done under the auspices of the GEF project.

- Detailed physical design and engineering

The basic physical design will be completed under the GEF project, but the detailed engineering work will be done under the auspices

2. Cartagena BRT/NMT System
   - Demand estimates for each corridor under different pricing and design scenarios completed. (Municipality/GEF)
   - Detailed physical design and engineering completed. (World Bank)
   - Operational Plan completed. (World Bank)
   - Six Stakeholder Meetings Held (Municipality)
   - Six Press Conferences Held (Municipality)
   - Financial Feasibility Study Completed (Municipality)
   - Business Plan completed (Municipality)
   - Technical specifications for all procurement completed. (Municipality)
   - Legislative changes required for completing the BRT authority completed and approved. (Municipality)
   - Regulatory changes required for compliance with the financial feasibility study completed. (Municipality)
   - Tendering documents and contracts for trunk line operators, feeder operators, ticketing system operator, and construction contracts completed. (Municipality)
   - BRT System constructed and tendered (World Bank/Muncipality)
   - Bicycle/Pedestrian Feeder Network Plan completed. (GEF)
   - Detailed engineering plan for bicycle and pedestrian basic network including along the shore. (GEF)
3. BRT Planning Guide completed and published within 8 months of award of GEF funding, and disseminated to at least 300 municipalities and experts working on BRT projects in CD Rom Format and made available on the internet in downloadable PDF format.
4. Summary reports on all the project's deliverables will be submitted by ITDP according to the schedule outlined in the monitoring and evaluation plan described in Section 7 below.

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| of the World Bank loan and with municipal financial sources.<br>o Socialization and Promotion among Stakeholders<br>This will be done primarily by the Municipality, with some involvement by the Foundation for the Country that We Want, a Colombian NGO.<br>o Legal Work, Institutional Structure, Financial Feasibility Plan, Regulatory Structure, Procurement Plans<br>This area of interrelated work will be done under contract to the municipality.<br>o Integration with bicycle and pedestrian infrastructure<br>As this is a key area this GEF project will support, more detail is necessary. A detailed design for a shared bicycle and pedestrian facility along the waterfront of Cartagena, and a detailed bicycle/pedestrian network plan will be completed. This work will be done by ITDP consultants Michael King or Michael Molle in cooperation with the Foundation for the Country that we Want, which includes the designers of Bogota's bicycle and pedestrian facilities.<br>[Cost for Cartagena: $1,065,580, of which GEF $189,850]<br><br>**3. Bus Rapid Transit Planning Guide**.<br>BRT informational tools and resources will be created to reduce existing barriers to the development of BRT systems. A BRT Planning Guide will be produced. The BRT Planning Guide will summarise each step of the planning process, as identified from existing BRT projects, as well as provide linkages to BRT documentation and resources. The BRT Planning Guide will also provide a directory of BRT service and equipment providers:<br>• Establish scope of work and contracts for all parties involved in the production of the BRT Planning Guide.<br>• Identify existing data sources that the Guide can build upon.<br>• Develop formal review process to control the quality of the Guide as it is developed; review team will include consultants and city officials having direct experience with successful BRT projects.<br>• Complete the BRT Planning Guide by a set schedule.<br>• Over the project period of 5 years, implement activities according to the dissemination and consultation strategy (see activity below).<br>[Cost: $268,758, of which GEF $45,300] | |

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| **Dissemination and Consultation Strategy.** Prepare and implement, over the project period of 5 years, a dissemination and consultation strategy consisting of the following elements:<br>• Prepare a final summary report, presentations, and other dissemination material on the outcome of the project's major deliverables.<br>• Develop and implement a distribution plan for disseminating the BRT Planning Guide to a wide audience of BRT professionals, city transport planners, and international stakeholders.<br>• Present the final results of the project at appropriate venues.<br>Note: the dissemination and consultation activities will be an aspect of the project from its beginning, and during the later years of the project will be the major focus. The BRT Planning Guide will be an exception; active dissemination will commence within the first year of project.<br>[Cost: included as an integral part of the preceding components.] | |

## 1.12. Estimated budget (in US$):

PDF: $25,000 (GEF Trust Fund); $28,500 (ITDP)

GEF: $724,595

Co-financing: $2,999,864

TOTAL: $3,777,959

INFORMATION ON INSTITUTION SUBMITTING PROJECT BRIEF

## 1.13. Information on project proposer:

**Institute for Transportation & Development Policy (ITDP)**
115 West 30th Street, Suite 1205 New York, NY 10001 USA.
tel. +1 212 629 8001; fax +1 212 629 8033; email mobility@igc.org; web www.itdp.org

Mandate:
ITDP was established in 1985 to promote environmentally sustainable and equitable transportation policies and projects worldwide. ITDP works exclusively in developing countries and economies in transition, where the consequences of inadequate basic mobility are the most keenly felt, and where the adverse social and environmental effects of rapid motorization are causing the greatest economic and environmental problems.

Organisational Structure:
ITDP is a non-governmental organisation governed by a Board of Directors comprising representatives from the private sector, international organisations, academia, and public institutions. The organisation is managed by an Executive Director from a headquarters office in New York. Africa is represented by a Regional Program Coordinator and Country Directors in Senegal and Ghana, with a new director being added in Tanzania. South Africa is currently represented by the Bicycle Empowerment Network, an ITDP Affiliate. Latin America is represented by a Latin America Regional Director. Central and Eastern Europe is represented by a Regional Director and a country director in the Czech Republic. The Asia Region is divided into a Director for South Asia and China, and a Director for Southeast Asia. In the Southeast Asia Region there is a Director for Indonesia. In the South Asia region there is a Director for India.

Advanced technical work is generally carried out through subcontracts to long-term consultant technical experts. Additionally, ITDP works extensively through sub-contracts with closely affiliated partner NGOs, particularly for socialization efforts but also on technical projects. Such organisations include (in order of importance): IIT-Delhi (India), Pelangi (Indonesia), AALOCOM (Tanzania), the Center for Sustainable Transport (Mexico City), the Energy Foundation Beijing Office (Beijing), ANTP (Brazil), Ciudad Viva (Chile), Foundation for the Country that We Want (Bogota).

Leadership:
Dr. Walter Hook is the Executive Director of the Institute for Transportation & Development Policy. The Director for Southeast Asia is John Ernst. The Regional Coordinator for Africa is Aimee Gauthier, but currently the Tanzania Program is under our Director for China and South Asia, Karl Fjellstrom. The Director for Central and Eastern Europe is Yaakhov Garb. Oscar Edmundo Diaz, former international affairs advisor to Mayor Enrique Penalosa of Bogota, is our Latin American Director. The former Director of ITDP's BRT Program, Lloyd Wright, remains involved in the BRT Planning Guide while completing a PhD at University College, London.

Sources of revenue:
ITDP is an NGO that currently receives revenues from the following sources: US AID (50%), the Hewlett Foundation, the Rockefeller Brothers Fund, the International Foundation, Alternative Gifts International, the Tucker Foundation and other small private foundations (40%), small private donors (5%), and the Global Environmental Facility and other international agencies (5%).

Recent programs/projects/activities

***US AID-funded Livable Cities Initiative in Indonesia, India, Ghana, Senegal, and Tanzania***

By far the largest program at ITDP since 2002 has been funded by US AID's climate change program to set up BRT systems and pedestrian zones in Jakarta, Delhi, Dakar, Accra, Cape Town, and most recently in Dar es Salaam. The Jakarta BRT system, designed with ITDP technical support to the DKI Jakarta Government, was opened in January of 2004, and we are currently helping them design the second corridor. The first BRT line in Delhi is scheduled to begin construction in September of 2004. Most of the technical work is being done under sub-contract to IIT TRIPP with technical advice from ITDP. This program also launched the Cape Town BRT project, but it is being designed by Steer Davies Gleave under direct contract to the Municipality. This program also launched pilot BRT projects in Accra and Dakar that are in the planning stages. The project was recently extended to provide additional capacity building support to Dar es Salaam, constituting some $100,000 of the promised matching funds.

***Access Americas and China Program***

ITDP's second largest program, funded by the Hewlett Foundation, is currently working on developing a congestion charging pilot project in a major South American city (the City has asked us to not make this information public). We are also assisting Mexico City with the pedestrian and bicycle facilities designs in their planned BRT corridors. This program will also be providing the $215,000 matching funds for the BRT Planning Guide.

***Rockefeller Brothers Fund Program in South China and Central Europe***

Under this program, central city brownfields were transformed into transit accessible residential and commercial developments as a means of reducing transport trips.

***US AID PVO Project to Modernize African Bicycles and Asian Cycle Rickshaws***

With support from US AID and the Toyota Foundation, ITDP, in cooperation with the bicycle industry, developed low cost, high quality bicycles for Africa and lightweight, inexpensive cycle rickshaws for India and Indonesia. Over 40,000 modernized cycle rickshaws using ITDP designs are now operational in India, and a test fleet of 100 modern becaks are in operation in Yogyakarta, Indonesia. Over 2000 modern 'California Bikes' have also been sold through the Global Bicycle Fund, a credit mechanism for African independent bicycle dealers. The California bike program cut 30% off the retail price of an equivalent quality bicycle. They are being used by health care workers and also sold to the general public.

## 1.14. Information on proposed executing agency (other than ITDP or the Municipality of Dar es Salaam and Cartagena):

### 1.14.1. BRT Plan in Dar es Salaam

While the contracts will all be managed by ITDP on behalf of the Project Management Unit of the Dar es Salaam City Council, and governed by a memorandum of understanding with the Dar es Salaam City Council, there will be three and possibly four major sub-contracts. The first sub-contract will go to either Akiris or J. Vlasak and Company to prepare the business plan and institutional plans for the Dar es Salaam BRT. Akiris is headed by Dario Hidalgo, former Deputy Director of TransMilenio in Bogota, and by Ignacio de Guzman, the TransMilenio Project Manager in the Mayor's office. J. Vlasak and Co. is headed by Jarko Vlasak, previously with McKinsey, who ran the TransMilenio project for Bogota Mayor Penalosa. We may give one company both tasks and we may split them into two tasks. The second major sub-contract will be for local legal expertise which will go to a Tanzanian legal firm. The third sub-contract will go to the Association for the Advancement of Low Cost Mobility (AALOCOM), a local NGO dedicated to the implementation of affordable transport options, for public participation and the less technical elements of NMT planning. AALOCOM will also play a central role in ensuring appropriate multi-modal integration, with support from the Interface for Cycling Expertise from The Netherlands. ITDP will then directly sub-contract several technical experts, such as Arthur Szasz (our survey design and management expert who did the traffic surveys for the Leon, La Paz and Cali BRT systems), and Michael King (formerly of the New York City Planning Agency) and Michael Molle (now the Bicycle and Pedestrian Coordinator of Tampa, Florida).

### 1.14.2. BRT/NMT Plan in Cartagena

ITDP will also oversee the GEF-funded consultant inputs to the BRT and NMT planning process in Cartagena, but most of the in-country work will be done through a sub-contact with the Foundation for the Country that We Want, an NGO founded by former Mayor of Bogota Enrique Penalosa. The designer of the bicycle paths and public spaces in Bogota under Penalosa is currently on the staff of the foundation and will be the project manager. ITDP will directly contract Logit for the completion of the technical work and on the BRT project. (Logit did the traffic modelling and planning for TransMilenio under sub-contract for Steer Davies Gleave), and Michael King for the bicycle and pedestrian facilities design.

### 1.14.3. BRT Planning Guide

ITDP will oversee the preparation of the BRT Planning Guide, and the budget in Section 4.1 below indicates which components of the BRT Planning Guide the different contributors will be asked to work on. The work will be handled under several large sub-contracts. The majority of the sub-contracts are likely to go to Akiris (of Bogota, as above), J. Vlasak & Co. (of Bogota, as above), Logit (of Sao Paulo, as above), Logitrans (of Curitiba), and Steer Davies Gleave (Bogota, Madrid, and London), and to Lloyd Wright of the University College London.

## 1.15. Date of initial submission of project concept: 20-Jan-03

INFORMATION TO BE COMPLETED BY IMPLEMENTING AGENCY:

## 1.16. Project identification number:

## 1.17. Implementing Agency contact person:

Ahmed Djoghlaf, Director, Divison of GEF Coordination, UNEP; Sheila Aggarwal-Khan, Programme Officer, GEF Medium sized Projects. Contact: gefinfo@unep.org.

## 1.18. Project linkage to Implementing Agency program(s):

UNEP has co-sponsored the joint UNEP/OECD/Austrian project on Environmentally Sustainable Transport (EST) in Central European Initiative countries in transition, completed in 1998. The EST Initiative has recently completed a five-year collaborative effort in order to develop a transport strategy and planning development methodology. One of the main outcomes of this, the 'EST Guidelines', was endorsed at the international EST conference in Vienna, October 2000, and endorsed by OECD Environment Ministers in May 2001. The PDF A proposal EST Goes East is a new activity focusing on promoting implementation of

the EST method and approach and is under development in UNEP's portfolio of GEF activities. This project here will be linked to the EST Goes East so as to demonstrate the experiences with BRT to Eastern European countries, taking advantage of the network of practitioners involved in EST.

As mentioned in Section 1.7.1, the Dar es Salaam plans will build upon some of the earlier work done by the Dar es Salaam City Council under the joint UN-Habitat / UNEP Sustainable Dar es Salaam Project.

Further linkages will be established with the Partnership for Clean Fuels and Vehicles (PCFV), which is the major program for UNEP in the promotion of clean fuels and vehicles in developing countries. Linkages will be established in several ways, including directly with the PCFV and with partners within the PCFV as discussed following:

- Submission of project results to the PCFV to assist in information dissemination and to gain feedback.
- Coordination with partners of the PCFV working in Tanzania, from government, the private sector, and NGOs involved in clean transport issues.
- Integration and information sharing with GTZ's Sustainable Urban Transport – Asia initiative, which is already working with ITDP in several areas.
- Information sharing and integration with the Clean Air Initiative for Asian Cities. ITDP's Livable Cities Project with US AID, which is funding all the technical assistance to the Bus Rapid Transit systems in Jakarta and Delhi, is already a partner of the CAI- Asia initiative. We have not integrated our project and the outputs of this project closely with the CAI web sites etc. yet, but ITDP staff will be doing this in the coming months. Project results and information resources will be shared with the CAI-Asia, including most likely through special side-events organised at the annual Better Air Quality conferences in Asia. The BRT Planning guide will draw on the project experience from CAI-Asia, and be useful to these efforts. ITDP sub-contractors, Sustran - Asia (based out of Pelangi-Indonesia) and IIT-Delhi (Geetam Tiwari), and ITDP staff John Ernst and Karl Fjellstrom all attended the BAQ 2003 meeting of the CAI Asia initiative in Manila, and are full participants in the CAI-Asia effort. CAI-Asia's work in transport policy and traffic management is being done by the participants in this project.
- Information sharing with the Bangkok Asian diesel emissions reduction initiatitve (DIESEL). ITDP is currently working with US AID to strengthen the traffic management component of this initiative. This initiative is still in the project development stage.
- Information sharing with EMBARQ's Shanghai initiative. ITDP have no formal involvement in this initiative, though ITDP are working with EMBARQ in Mexico City, and are close partners with the Energy Foundation (EF) in Beijing. EF are members of EMBARQ, albeit with minimal involvement.
- Information sharing with with lead phase-out initiatives such as in Dakar and Nairobi, including through contacts with Marianne Bailey of the US EPA.

Such linkages are wide ranging and include common personnel, shared objectives, information exchange, participation in seminars and events, linkages and document postings on websites and in e-bulletins and publications, organisation of sub-workshops at major regional events, technical reviews, and so on.

# 2. PROJECT DESCRIPTION

The following sections describe the components of the project, the main activities to be undertaken, and what the project hopes to achieve.

## 2.1. Project rationale and objectives

### 2.1.1. Objective

This proposal seeks to implement a pilot BRT system in Dar es Salaam, Tanzania, that will be the first stage of a 100km trunk system that will be the first and most extensive BRT system in Africa. Secondly, it seeks to implement the first fully developed NMT feeder system as an integral part of the planned 12km pilot BRT system in Cartagena, Colombia. Finally, the project team, which includes leading BRT experts primarily from Brazil, Colombia, and the US, will document the BRT planning process in a BRT Planning Guide so that others wishing to develop BRT projects on their own will not have to rely heavily on expensive first world consultants. This Guide will also outline a basic methodology for quantifying projected greenhouse gas and other emissions.

Transport continues to be the fastest growing sector of greenhouse gas emissions globally, and yet it is also the sector where the least progress has been made in addressing cost-effective reductions. The International Energy Agency estimates that by 2020 the transport sector will surpass the industrial sector as

the largest source of greenhouse gas (GHG) emissions. BRT is a low-cost option that has been shown to attract more customers to public transport, and thus mitigate mode shifts to private vehicles.

An increasing body of evidence indicates that Bus Rapid Transit (BRT) systems coupled with Non-Motorized Transport (NMT) facilities as feeder systems are one of the few ways to check the rapid growth of private motor vehicle use and related CO2 and other emissions. While BRT systems are spreading rapidly within Latin America, and are beginning in Asia, thus far there are no BRT systems in Africa. Furthermore, those BRT systems that have been developed (Bogota, Curitiba, Quito) have either ignored bicycling all together or have developed parallel cycling facilities that are not built as part of a planned feeder system for the BRT system. One of Bogota Mayor Penalosa's greatest regrets was that he did not design cycling facilities as a feeder system to TransMilenio.

Bus Rapid Transit (BRT) is a mass transit option that provides high-quality mobility at a small fraction of the cost of other transit solutions such as rail-based metros. BRT utilises bus technology within a metro network structure to provide comfortable, fast and low-cost public transport that can deliver car-competitive service for urban residents. The primary characteristics of BRT systems include:

- Segregated busways
- Rapid boarding and alighting
- Clean, secure and comfortable stations and terminals
- Efficient pre-board fare collection
- Clear and prominent signage and real-time information displays
- Transit prioritisation at intersections
- Modal integration at stations and terminals
- Clean bus technologies
- Sophisticated marketing identity
- Excellence in customer service
- Profitable and sustainable business models
- Effective planning and regulatory institutions.

One of the most important of these characteristics is the use of exclusive busways. The prioritisation of public transit affects travel time, ride quality, and the image of transit within a city's overall development strategy. All the other BRT features listed above, however, are also critically important, including integration with non-motorized transport and associated pedestrian improvements. Every BRT passenger is also a pedestrian, before boarding and after alighting. Viable institutional, business and regulatory models are needed for a successful project.

While BRT systems are much less expensive than the next lowest cost public transit option, they are technically reasonably complex to implement. While wealthier cities in Latin America and Asia can afford world-class international consultants to design and implement BRT systems, poorer cities unable to afford the $5 - 7 million in planning and consulting fees will have to rely more heavily on their own expertise.

ITDP's involvement in Dar es Salaam and Cartagena makes it possible for those cities to assemble directly a team of world-class international experts without having to go through a large international consulting firm that will generally just act as a middle man and sub-contract to the same experts.

### *Eligibility for GEF funding*

BRT and NMT projects closely accord with the national and city level priorities of Dar es Salaam and Cartagena, because these measures simultaneously address issues such as air pollution and noise, congestion, road accidents, severance of communities, commercial viability of public transport, city livability, energy policy, and the transport burden on the urban poor. It is this capacity of BRT to simultaneously address multiple local developmental objectives while significantly reducing GHG emissions that makes it highly consistent with the GEF criteria under OP11.

In March 2002, the GEF's Scientific and Technical Advisory Panel (STAP) met in Nairobi, Kenya to review progress to date in addressing transport-related emissions and to discuss strategies for more effectively addressing this issue. BRT was identified as a low-cost option that has shown to attract more customers to public transport usage, and thus mitigate dramatic mode shifts to private vehicles. BRT makes use of a full range of emission reducing effects, including greater mode share for public transit, more fuel efficient operations and vehicles, and reduced distances travelled.

Following the GEF STAP meeting March 2002, the World Bank in April 2003 announced a revised approach to GEF funding in a paper entitled, "Climate Change and Urban Transport: Priorities for the World Bank" (available for download at www.itdp.org). Four new priority areas are outlined (pg 6), all of which are

consistent with this project's emphasis on BRT and associated non-motorized transport and demand management instruments:

> "The Global Environment Facility's Operational Programme on Sustainable Transport (OP11) presents opportunities and challenges for developing countries and the World Bank to address the climate change impacts of the transport sector. The purpose of this paper is to help identify interventions within the urban transport sector that are both consistent with the national priorities of developing countries and with the GEF's climate change objectives.
>
> The analysis begins with a review of the World Bank's urban transport strategy (2002), reflecting a concerted effort to identify priorities for the sector within developing countries. These priorities are then compared with the emerging global environmental objectives of the GEF's OP11. This analysis reveals the following areas of overlap:
>
> - Promotion of low-cost public transport modes, such as bus rapid transit
> - Non-motorized transport, including bikeways and pedestrian walkways
> - Transport and urban planning to facilitate efficient and low-GHG modes of transportation
> - Transport demand management measures that favor or enable public transport and NMT."

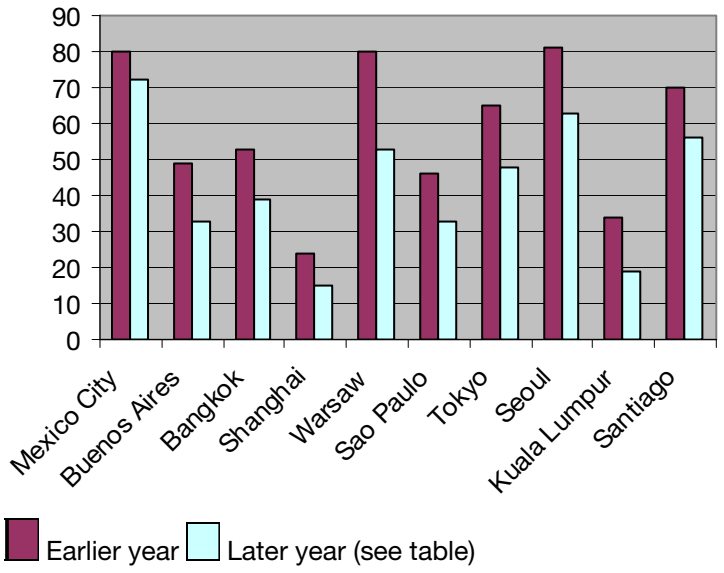
### *The 'mode-shifting' potential of BRT*

Many developing-nation cities currently have modal shares of public transit and non-motorized transport that most OECD country planners would envy. Unfortunately, the quality of travel by these modes is often poor, which leads passengers to switch to two-wheel and four-wheel motor vehicles as soon as they can afford it. The figure below shows data from *Mobility 2001* (a World Business Council for Sustainable Development report) and other sources, indicating the erosion of public transit's ridership base with time.

**Trends in the modal split of public transport in selected cities**

| | Earlier year | % of motorised trips | Later year | % of motorised trips |
|---|---|---|---|---|
| Mexico City | 1984 | 80 | 1994 | 72 |
| Buenos Aires | 1993 | 49 | 1999 | 33 |
| Bangkok | 1970 | 53 | 1990 | 39 |
| Shanghai | 1986 | 24 | 1995 | 15 |
| Warsaw | 1987 | 80 | 1998 | 53 |
| Sao Paulo | 1977 | 46 | 1997 | 33 |
| Tokyo | 1970 | 65 | 1990 | 48 |
| Seoul | 1970 | 81 | 1990 | 63 |
| Kuala Lumpur | 1985 | 34 | 1997 | 19 |
| Santiago | 1977 | 70 | 1991 | 56 |

Source: WBCSD 2001, Barter 1999, Kuala Lumpur Draft Master Plan 2003, National Transport Secretariat of Argentina 2001




However, this trend is not preordained. There exist many cost-effective mechanisms to improve the quality of public transit and non-motorized options in developing countries, and thus retain and even expand modal share for these options. In fact, a small number of cities have been successful in raising the profile and usage of sustainable transport modes. These cities share a common characteristic: they have implemented BRT systems, usually complemented with transport demand management, measures to improve conditions for non-motorized transport, and promotion of transit-oriented development. These BRT systems have succeeded in *both increasing public transit ridership and reducing private motor vehicle mode share*. With the introduction of the TransMilenio BRT system in Bogota, public transit ridership increased from 67% to 68% when the system had only opened two out of 22 planned lines. Curitiba's BRT system witnessed a similar increase when initially opened, and was able to increase ridership by 2.36% per year for over two decades, enough to stabilize public transit mode share for over 3 decades (Rabinovitch & Hoehn, 1995; Municipality of Bogota, 2002). Kunming reported similarly impressive gains in public transport patronage after implementing a BRT system. Passenger trips on the system increased from 500,000 to 900,000 daily between 1999 (when the system was opened) and 2002. The modal share of public transport increased from 6% to 12% of trips in the city over the same period. Similar data is not yet available from other new BRT systems in Shijiazhuang, Jakarta, Quito, Porto Alegre, Sao Paulo, Taipei, and Goiania, which have now successfully adopted elements of the Curitiba model. These BRT systems have been delivered at a relatively low cost of $1 million to $5.3 million per km. Once constructed, they are fully self-financing at under $0.50 per ride, and providing service capacity of up to 35,000 passengers per hour per direction. The

system designers maintain that this capacity may be increased to more than 50,000 passengers per hour per direction simply through making changes in the operations design.

The erosion of public transit's mode share points to how we should view emission baselines and measure success. While cities like Bogota and Curitiba demonstrate that reverses in mode split declines of public transport are possible, simply retaining existing transit and non-motorized customers in the developing world will realize large emission savings.

When most municipal officials decide to do something about declining public transit use and worsening traffic congestion, many of them decide to build extremely expensive rail-based metro, MRT, or light rail systems. There is little evidence that such investments into rail-based systems have actually reversed the decline in transit mode share. This is generally because such systems are too expensive to substantially improve conditions for the majority of public transit passengers. The BRT Planning Guide will therefore include guidance on mass transit options according to key system parameters such as cost, passenger capacity, speed, environmental impacts, implications for GHG emissions, and poverty alleviation.

### *Project Rationale for Dar es Salaam*

Due to work funded under the PDF.A. for this project, there is now firm political commitment to building a BRT system in Dar es Salaam, Tanzania. It is likely that this will be the first BRT system in Africa. (Cape Town, Dakar and Accra are also developing projects.)

Dar es Salaam, a city of over 3.2 million residents, has a fleet of private motor vehicles and minibuses that is growing faster than the 4% annual GDP growth rate. The vast majority of trips in Dar es Salaam are concentrated on the central business district (CBD). Only 4 arterials and one 2-lane road serve the over 450,000 daily transit passengers entering the CBD, and these roads are heavily congested with private vehicles and about 7,000 minibuses (16-seater Toyota Hiaces) and medium sized buses (30 seater Isuzus). If nothing is done to check their growth, CO2 emissions from the transport sector in Dar es Salaam are projected to increase by 50% by 2010, an increase of 1,474,000 MT just within the affected area. The aim of the project is to stabilize modal split in Dar es Salaam within the affected area over a 5 year period, and reduce significantly greenhouse gas and other emissions over the projected baseline, reducing CO2 emissions in the project area by 430,000 metric tons within the first year of BRT operation.

### *Project Rationale for Cartagena's NMT Feeder System to BRT*

Cartagena offers a first Latin American opportunity to design a BRT system with an NMT feeder system planned into it from the inception. Cartagena, a thriving tourist centre, has recently pedestrianized its historical centre. It also has an extensive coastline. This offers a unique opportunity for developing a pedestrian/cycling network as part of an integrated NMT- BRT project.

Cartagena has over one million inhabitants concentrated in an extremely dense urban area. Motorized trips are heavily concentrated on two major arterials connecting residential zones to the downtown. A large population of low-income settlements are clustered along the shoreline. An exclusive bicycling and pedestrian facility (a boardwalk) along the waterfront could not only serve as a feeder to the BRT line, it could also dramatically increase cycling trips to the downtown, taking pressure off the two arterials, and improve mobility among Cartagena's poorest citizens. The project should allow Cartagena in a period of five years to slightly reduce the current modal split of 22% private motor vehicles and taxis to 19% (most reduction from taxis), to increase bike use from less than 1% to perhaps 3%, and 78% bus use would fall marginally, to 77% (as some passengers switch to much cheaper bicycles). A crude estimate of roughly 63,000 metric tons of $CO_2$ emissions reduced per year in Cartagena is reasonable the first year after implementation.

### *Rationale for the BRT Planning Guide*

There are three reasons why an authoritative BRT Planning Guide is necessary. First, if a city wants to design a BRT system on their own, there is no single resource for them to use. As such, they must rely on expensive international experts, and they do not know which ones to trust. Secondly, if a city already has a BRT system that was designed by international experts, they may not know how it was designed and hence how to extend the system. Finally, because there is currently no authoritative guide to 'best practice' BRT planning, many systems around the world are being designed making fairly serious mistakes that are compromising the emissions benefits of those systems. Municipal governments often are misled into believing that designing a BRT system is simple, and that they can use local experts. Local experts look at photos of Curitiba and copy the physical aspects without understanding that BRT systems have to be designed for the specific conditions in a particular city or else they can actually make congestion and air

pollution worse. An authoritative planning guide developed by leading experts is critical to both empowering local municipalities to design their own systems and also to avoid significant mistakes.

The Brazilian, Colombian, and US experts cooperating in this project are some of the best in the world, and have worked on the most successful BRT projects around the world. ITDP, Logit, Steer Davies Gleave, Akiris, and Jarko Vlasak and Co. have collectively worked on or are working on BRT projects in Bogota, Sao Paulo, Jakarta, Delhi, Dakar, Accra, Cape Town, Chengdu, Leon, and numerous other cities in earlier stages of project development.

As some of the world's leading experts will be working on this project together anyway, and as this will be the first BRT system designed in Africa, the team decided it should also take the opportunity to document the step-by-step process for planning and designing integrated BRT-NMT systems in an African context so that in the future municipalities can use these guidelines with less reliance on expensive international experts.

To design a highway, virtually all traffic engineers the world around rely on the US-based Highway Capacity Design Manual. This manual has led to the exportation of designs often inappropriate in a developing country context. Nor does this manual provide any information on BRT systems, and it contains only US-based information on bicycling and pedestrian infrastructure design.

As such, we decided to use this project to also develop a BRT planning guide, building on some of the excellent work already done by Lloyd Wright under the auspices of GTZ. The Hewlett Foundation has agreed to provide the vast majority of the funding for this element of the project ($215,000), but additional resources from the GEF would allow us to document many of the more technically complex elements of BRT system design such as traffic modeling, legal issues, financial planning, etc.

The BRT Planning Guide will be released in several versions, the first version within one year of project inception, so that the lessons can be immediately transferred to the other cities mentioned above currently actively developing BRT projects.

## 2.2. Current situation (baseline course of action)

### 2.2.1. Dar es Salaam

Traffic in Dar es Salaam, a city of 3.2 million residents, has been growing rapidly since the economy began to expand again at around 4% per year in the mid-1990s. Bus services, which were controlled by a private British firm from 1949 until 1970, were nationalized in 1970, and in 1974 the current public transit agency Usafiri Dar es Salaam (UDA) was created. Since that time, UDA has experienced many of the problems typical of state-owned bus operators world-wide, including unclear corporate objectives, vaguely stated service obligations, strictly controlled fares, lack of capital to purchase spare parts, lack of qualified technicians and planners, and aged and obsolete fleet, high staff per vehicle ratios, and low profitability. Lack of investment into UDA meant that the public bus fleet did not expand to meet the transit needs of the growing metropolis. In 1983 privately owned buses known as *Daladala*, banned since 1975, were again permitted to meet this growing demand. Today, UDA has shrunk to insignificance. Some 65% of the bus fleet consists of Toyota Hiace 12-seat *Daladalas*, and around 35% being 24-30 seat *Daladalas*. The number of *Daladalas* has increased from 824 in 1992, to around 7,000 in 2003.

While Daladalas filled a critical need for mass transit service, their proliferation has also brought a lot of problems. While their routes are regulated, with services on around 26-30 official routes, the *Daladalas* face declining operating speeds and declining profitability due to worsening traffic congestion. These imported second-hand vehicles are heavily overcrowded, old, unsafe, inefficient users of fuel, uncomfortable, and polluting. Their competition for passengers creates unsafe conditions for pedestrians and waiting passengers. Their poor quality alienates potential passengers. Lack of regulation also means that more vehicles than are necessary congest the main arterials, while other areas go underserved.

Today, private motor vehicles (taxis, cars, and motorcycles) represent 23% of total motorized trips, and this share is projected to increase to 31% of total trips by 2010. Meanwhile collective modes account for 77% of total motorized trips, and this share is projected to fall to 69% by 2010.

If nothing is done to check this trend, annual CO2 emissions from the transport sector in Dar es Salaam are projected to increase by 50% by 2010, an increase of 1,474,000 MT annually just within the affected area.

Without the project, the Municipality is likely to use the money from the World Bank Central Roads Corridor Project to widen Morogoro Road, and simply invest in modern buses at UDA. The former is likely to induce considerable traffic and increase CO2 emissions further. Modernizing the UDA bus fleet without the

development of BRT is unlikely to prove financially sustainable. Had the possibility of GEF funding for BRT not arisen, the government would not have had the confidence to move forward with BRT and would have returned to this failed approach.

### 2.2.2. Cartagena

Cartagena, a city of over one million inhabitants, is one of the most beautiful cities in Latin America. On the Atlantic Coast, the historical core is a perfectly preserved 16th Century city registered as a World Heritage Site with UNESCO. The potential for tourism development is large. The city partially pedestrianized the historical core, but it only shut the streets to traffic and did not re-landscape the public space, so that the pedestrianization could easily be retracted.

However, it is also an industrial port, and a large population of low-income squatter settlements are clustered along a large part of the shoreline. The city is extremely dense, and motorized trips are heavily concentrated on two major arterials connecting residential zones to the downtown and to industrial areas and the port.

Old, deteriorated buses are increasingly trapped in congestion and the city is currently unsafe for cyclists or pedestrians. Unless public transit and non-motorized vehicle access to the historical core, to the port, and to industrial areas can be improved, not only will air pollution and greenhouse gas emissions continue to increase dramatically, it is likely that the pedestrianization will be undone.

#### *BRT Planning Guide*

Many cities around the world are aware of BRT and are interested in developing their own systems but do not know how to begin to plan and design such a system. Even municipalities that do initiate projects believe that BRT is simply creating exclusive bus lanes. Several cities are currently designing BRT systems that are deeply flawed and will not significantly reduce GHG emissions. Badly planned systems can actually make greenhouse gas emissions increase, can worsen traffic congestion, or can simply be a waste of resources.

Most municipalities do not fully understand the complexity of BRT planning. This situation is particularly true in Africa where no BRT system yet exists, but it is also true in Asia where Jakarta opened the first 'closed' BRT system in January of 2004. Not a single person from the political or technical agencies in Dar es Salaam, for example, had even visited a BRT project prior to the GEF PDF activities.

Experience with state of the art BRT systems proven to work in a developing country context is extremely limited. TransMilenio in Bogota, which set a completely new performance standard, has only been operational since late 2000. The planning experience from TransMilenio is currently known most closely by the core consultants involved, members of the core city government team (many of whom now work for TransMilenio S.A.), and key individuals such as the then Mayor. Similarly in other cities, experience with BRT planning is often concentrated amongst the implementing consultants, contractors, and officials involved, but is not widely known outside these circles.

Typical BRT planning mistakes are common even amongst transport consultants and specialist transport agency personnel. Some common and potentially damaging misconceptions that have influenced projects ITDP has been involved in include:

| 'Myth' | Reality |
|---|---|
| BRT corridors should be built first where there is enough road space. | Plenty of roads are wide but don't have any public transit traffic on them. Building a BRT on such routes will do nothing. Rather, BRT corridors should prioritize routes with maximum numbers of transit passengers, areas of congestion, and only secondarily consider available right of way. |
| A BRT system should look just like Curitiba or Bogota. | Curitiba was designed before traffic modelling was a developed science, and the busway congests at the station stops, causing needless delays. Bogota was designed to handle 45,000 passengers per direction at the peak hour, which may not be necessary. Without a demand estimate, appropriate system design cannot be determined. |
| A BRT system is just a matter of building separate lanes for buses. | Separate lanes for buses only matter if the road is very congested. Much of the travel speed advantage of Curitiba and Bogota come from the platform-level pre-paid boarding stations that allow rapid loading and alighting. Some systems in Europe and Brazil don't even have physical lane separation but use on-board camera technology to enforce violations of bus priority. |
| BRT systems don't require | If a BRT system is to be self-financing, chances are that existing bus routes will have |

| | |
|---|---|
| changing normal bus routes. | to be changed. |
| Prepaid boarding stations always make sense. | For very short systems without highly concentrated demand on a few corridors, prepaid boarding stations, which require the development of a feeder system, may not be viable. |
| BRT systems don't need feeder lines. | About 45% of the demand on Bogota's TransMilenio comes from passengers on feeder buses. Working out the feeder system and the contracts for trunk and feeder operators is a very tricky business. |
| Municipalities should just build and operate a BRT system like it would a Metro system. | The beauty of BRT systems is that they can be operated by the private sector and be self-financing, unlike most metro systems. For this to be viable, however, the system has to be designed from the inception to be self-financing and privately operated. |

## 2.3. Expected project outcomes (alternative course of action)

### 2.3.1. Dar es Salaam

Under the auspices of the PDF.A. for this project, the Dar es Salaam City Council, in cooperation with the national government, ITDP and AALOCOM, a local NGO, decided to develop a BRT system for the city. The political leadership, municipal planning staff, and the private sector bus operators all supported the preliminary BRT plans articulated during ITDP consultant team visits in August 2002 and May 2003. Since that time, the project has moved forward in anticipation of UNEP GEF support and secured the necessary additional sources of financing.

Under Phase I, the first 10km trunk line will be completed on Morogoro Road, which handles roughly 270,000 daily transit trips into and out of the CBD. The first corridor represents roughly 1/3 of the total benefits that will be accrued from introducing BRT to the whole CBD. 100 km of feeder lines will also be implemented, along with 30 km of integrated non-motorized transport feeder systems.

Planning will also be completed for the total 100km BRT trunk system with 200km of feeder lines. The initial trunk line will capture an estimated 90% of existing transit trips in the corridor (with most existing buses re-routed in other corridors and / or used as feeders), as well as attracting some 24,000 trips from cars, motorcycles and taxis. In addition, it is reasonable to assume that a portion of the demand currently using other corridors will be attracted to the Morogoro corridor, although this 'diversion' factor has not been included in the CO2 emission reduction estimate. It is also reasonable to assume that a significant suppressed demand for transit services exists in Dar es Salaam, given the long queues which form even at off-peak times, and the very high passenger loadings of the vehicles. Once again, however, a 'suppressed demand' factor has not been included in the estimate, to ensure the estimate remains conservative. The BRT system will be designed for a daily capacity of roughly 400,000, and is projected to carry 266,000 daily initially. To reach this level at an acceptable speed, the system will need to have articulated buses, fully enclosed pre-paid boarding stations, and a single exclusive bus lane with a passing lane at high volume stops.

CO2 and other emissions reductions will result primarily from a shift of 24,000 daily passengers from private vehicles to buses, and from the reduction of total bus trips on Morogoro Ave. used to move 14,000 peak hour passengers per direction from around 900 to less than 90. Combined, this should lead to a reduction of 430,000 metric tons of CO2 emissions in the first year over baseline emissions projections, and a reduction of 1,119,000 metric tons of CO2 over the baseline by 2010. (See Appendix 5)

### 2.3.2. Cartagena

Influenced by the success in Bogota, Cartagena decided to move forward on developing an integrated BRT/NMT and aquatic transportation system. The UNEP GEF project will only be concerned with the BRT and NMT systems. The plans are for a 12km pilot phase of a planned 25.9 km trunk system. This trunk line will be the first trunk line in a planned system with three trunk lines. These three lines will be served by 12 feeder routes. The trunk system is projected to carry 130,000 daily passengers, 83,000 of which will reach the trunk lines by feeder lines. There will be 23 station stops, all of them in the central median.

However, the preliminary planning for this system did not take into consideration NMT as a feeder system. During a visit in 2003, Bogota Mayor Enrique Penalosa convinced local leaders to explore the possibility of an exclusive bicycling and pedestrian facility (a boardwalk) along the waterfront, which could not only serve as a feeder to the BRT line, it could also dramatically increase cycling trips to the downtown and to industrial areas, taking pressure off the two arterials. At the end of the project, we anticipate that the first 12km BRT will be completed, along with 10km of waterfront NMT facilities, integrated on-road bicycle and pedestrian facilities leading to main BRT stations, and bicycle parking facilities at key BRT stations.

The target for Cartagena for the first year after implementation the integrated NMT/BRT system is to slightly reduce the current modal split of 22% private motor vehicles and taxis to 19% (most reduction from taxis), to increase bike use from less than 1% to perhaps 3%, and 78% bus use would fall marginally, to 77% (as some passengers switch to much cheaper bicycles). A very crude estimate of roughly 63,000 metric tons of $CO_2$ emissions reduced per year in Cartagena is reasonable after the first year. Without the involvement of the UNEP GEF program, the significant modal shift towards bicycle would not occur, significantly reducing the CO2 emissions benefits.

In addition, according to the planning documents from CONPES, the integrated project will reduce NOx by 37%, CO by 32%, and volatile organic compounds by 41%.

### 2.3.3. BRT Planning Guide

While the specific CO2 emissions reduction impacts of the BRT Planning Guide are more difficult to quantify, the Guide will be used by at least a dozen major BRT projects around the world and will significantly increase the chances of project success in each of them. Furthermore, the BRT Planning Guide should give confidence to at least 5 additional cities to launch BRT projects, equipped with the tools they need to set up, manage, and implement a successful BRT project. Furthermore, several cities considering metro projects will be given the support they need to find lower cost solutions. At least 300 copies of the Planning Guide will be distributed in CD Rom format, and it will be produced in at least three relevant languages.

The completion of the BRT Planning Guide will significantly raise knowledge and awareness about BRT planning and about the emission reduction potential of BRT:

- An explicit goal of assisting developing cities with the BRT planning process, through increasing knowledge and awareness of BRT, mass transit options and emissions benefits of BRT.
- An attractively presented assessment of mass transit options for a city, according to key criteria such as cost, passenger capacity, and so on.
- Effectively illustrated and easy-to-read materials including numerous case studies and examples from cities which have implemented BRT systems.
- Outputs which are adjusted to the needs of key target audiences of the Planning Guide. For example, an ‘Executive Summary’ version, with attractive and arresting visuals and support materials such as videos, will cater to the needs of leading officials such as Mayors and City Councillors, who may not need to be involved in the fine technical details of the planning process. Conversely, more detailed materials will be available in the main BRT Planning Guide document, catering to the needs of the officials and consultants who are actually planning and implementing the system.
- Dissemination and consultation activities involving the BRT Planning Guide will be implemented during the course of the project.

## 2.4. Activities and financial inputs needed to enable changes (increment)

### 2.4.1. Dar es Salaam

At the end of June, 2004, the Dar BRT project was formally launched. The Project Management Unit was established in City Hall, and a British-trained Tanzanian project leader, Raymond Mbilinyi was hired. A steering committee for the BRT Project was formed by the Mayor of the City (chair person), and including the Dar es Salaam City Director, the Mayors of Dar es Salaam Municipalities (Ilala, Kinondon and Temeke), the Municipal Directors, the Director of Surface Transport (Ministry of Communications and Transport), the Managing Director of TANROADS, the Manager of the Road Fund Board, the Director of Environment (Vice Presidents Office), the Dar es Salaam Region Administrative Secretary, the Commissioner of Budget (Ministry of Finance), the Director of Local Government (Presidents Office, Regional Administration and Local Government), and the Executive Secretary of the Association for Advancing Low Cost Mobility (NGO). These will nominate a 3 member technical committee for follow up and approval of study reports. The secretary of the technical committee will be the manager of the BRT Project Management Unit. ITDP, which participated in the structuring of the project, is a technical advisor to the Project Management Unit. ITDP’s relations with Dar es Salaam City Council and the Lord Mayor are governed by a memorandum of understanding which obligates ITDP to spend funds from US AID and the UNEP GEF on the items stipulated in the budgets for these grant agreements.

In 2004, the municipal government committed $350,000 to the project. Of this, $100,000 has already been transferred to the account of the Project Management Unit. The three municipal governments (sub-Metropolitan level) are donating collectively $150,000. The national government committed $100,000 of its own funds. As a result of a visit by Lord Mayor Sykes to the World Bank in April of 2004 arranged by ITDP

under the auspices of the PDF.A. grant from UNEP, the World Bank agreed to use $1 million in technical assistance funds from the Central Corridor Transport Project Loan to cover the initial traffic planning and system engineering. On June 30, 2004, bids for implementing the RFP from the Dar City Council for the World Bank funds were received (three of which were encouraged to apply by ITDP) and full proposals will be requested from a shortlist of 6 identified by mid-August, 2004. Several qualified candidates have applied including COWI, Steer Davies Gleave, and Logit, all in partnership with local firms. The final contractor will be selected by October, 2004, and work should begin in November or December. A possible $20 million in additional funding for implementation from the World Bank loan is also available.

US AID, through ITDP, has provided $100,000 to finance part of the capacity building related to the BRT/NMT project. These funds were added to an ongoing cooperative agreement between ITDP and US AID, and the funds are already available. ITDP has already sent Karl Fjellstrom for two weeks to supervise preliminary screen-line counts into the CBD and other surveys, and to advise on the drafting of the TOR and the structuring of the PMU. On July 15, ITDP's Arthur Szasz will be arriving for two weeks to initiate the complete survey of bus lines and routes and initiate an on-board Origin-Destination survey critical to traffic modeling that will be done by the World Bank contractor.

I-CE from the Netherlands has agreed to dedicate $22,500 for NMT planning and capacity building at AALOCOM. The World Bank has indicated a possible interest of the International Finance Corporation in assisting with the procurement of the new bus fleet.

These amounts were allocated and tasks assigned in anticipation of an estimated $500,000 in UNEP GEF funds being available. The incremental funding from the GEF will be used for the following purposes that were not included in the existing terms of reference for the World Bank loan.

The UNEP GEF program is now being asked to finance the business plan for the BRT system, for the structuring and drafting of the contracts for the regulatory authority, for the operators, the feeders, and the ticketing system, for the procurement of traffic modeling software by the project unit, for training of the PMU staff, and for part of the detailed design of pedestrian and cycling facilities in the corridor. The total proposed increment of GEF funding is $500,000.

The breakdown of all the tasks in the Dar BRT planning process are as follows:

- Basic data collection and traffic modeling.

ITDP, with US AID funds, has already begun this process. The GEF funds will support further capacity building within the municipality. Most of the detailed scenario modeling will be done under the World Bank contract.

- Detailed physical design and engineering

This will be done entirely under the auspices of the World Bank loan.

- Operational Plan

This determines detailed bus routing changes in the new system. This will be covered under the World Bank loan.

- Socialization and Promotion among Stakeholders

This will be done primarily by the Municipality, with some involvement of ITDP funded by US AID. Most important is the public relations campaign and the involvement of the existing bus operators.

- Legal Work, Institutional Structure, Financial Feasibility Plan, Regulatory Structure, Procurement Plans

This area of interrelated was work was left for the UNEP GEF grant to pick up, so it will be explained in greater detail. In TransMilenio it was handled by McKinsey and a Colombian law firm. In this project, it will be done by Akiris or Vlasak & Co. based on competitive tender.

A BRT system, when done properly, generally requires several legal and regulatory changes. First, the regulatory authority, (TransMilenio in Bogota or Urbis in Curitiba) has to be created, and its powers assigned. Secondly, the route licenses for the existing operators have to be changed in a way that ensures the system will be profitable. Thirdly, the contracts for the bus operators, the feeder operators, and the ticketing system operator all have to be drawn up and bid competitively. The responsibility for procurement is generally put on the bidders, but following technical specifications drawn up by the project team from a list of eligible suppliers. The success or failure of a BRT system frequently is determined by getting this process right.

- Integration with bicycle and pedestrian infrastructure

Designing proper bicycle and pedestrian infrastructure as a feeder system to the BRT system is critical to the project's success. The Institute for Cycling Expertise will cover the bicycling elements of this project. The pedestrian infrastructure planning will be done by ITDP expert Michael King or Michael Molle or Jackson Wandres with funds from the UNEP GEF grant.

### 2.4.2. Cartagena

Already in August of 2001, with discussions between the World Bank and the National Government underway for an integrated urban mass transit loan, Cartagena signed an agreement with the Ministry of Finance to provide the required matching funds to be eligible to participate in the BRT projects to be funded under the World Bank loan, which is to be awarded by the national government to Colombian cities on a competitive basis.

In February 2002, the municipality of Cartagena, with the assistance of ITDP and the German Technical Cooperation (GTZ) hosted an international seminar on sustainable transport options. Building on capacity building efforts there by JICA (OD matrix completed in 1992, now out of date) and UNDP (transport sector capacity building), and a successful *permanent* pedestrianization of the historical core of Cartagena, in March 2002 the Municipality of Cartagena published its vision statement for a sustainable transport future, strongly linking accessibility to development and poverty eradication. The document, *Movilidad Para Todos* (Mobility for All), sets out the municipality's investment and planning priorities. These priorities include the development of:

- A more prosperous, competitive, sustainable and equitable urban centre by permanent pedestrianisation and urban regeneration efforts;
- Pedestrian corridors throughout the city that will allow all segments of society to comfortably and cost-effectively reach economic opportunities, mass transit facilities, and public services;
- A bicycle network that will integrate with other transport modes and provide full coverage to major destinations such as businesses and schools; and,
- A Bus Rapid Transit system that will provide a low-cost, quality transit service to all income sectors.

After this, with the possibility of World Bank financing and UNEP GEF financing becoming available, the Municipality initiated a preliminary BRT plan. The Mayor's office contracted BRT experts Logit from Brazil to prepare a BRT Plan. This plan envisioned a 25.75 km BRT system to be built in two phases, the first being 12km. Cartagena submitted these preliminary plans to the National Government, and the National Government then included the implementation of this BRT system in its negotiations with the World Bank for its Integrated Mass Transit Systems Loan, which was signed in June of 2004. The IBRD has committed $46.7 million for the implementation of the first 12km BRT system, and the municipality has committed an additional $35.3 million in matching funds. These funds, however, are earmarked for the physical construction of the BRT system, and responsibility for the completion of the traffic planning rests with the municipality.

The Municipality of Cartagena, however, has not completed the necessary detailed designs for their BRT system, and the current plans, developed under the previous Mayor, lacked a comprehensive design for pedestrians and bicycle facilities both inside the bus corridor and as a feeder to the corridor. The Municipality approached ITDP and the UNEP GEF to fund these activities to complement and improve the design. The use of NMT as a feeder system was not developed in Bogota and is now being retrofit into the system.

The total project tasks and the responsible parties are as follows:

- Detailed physical design and engineering

The basic physical design will be completed with funds from the Municipality but with some oversight by the GEF project. The detailed engineering work will be done under the auspices of the World Bank loan but with municipal financial sources.

- Operational Plan

The final operational plan will be an important part of the GEF project. The contract is likely to be carried out by Logit (Brazil).

- Socialization and Promotion among Stakeholders

This will be done primarily by the Municipality, with some involvement by the Foundation for the Country that We Want, a Colombian NGO, as a subcontract under the GEF project.

- Legal Work, Institutional Structure, Financial Feasibility Plan, Regulatory Structure, Procurement Plans

This area of interrelated work will be done under contract to the municipality.

- Integration with bicycle and pedestrian infrastructure

As this is a key area this GEF project will support, more detail is necessary. A detailed design for a shared bicycle and pedestrian facility along the waterfront of Cartagena, and a detailed bicycle/pedestrian network plan will be completed. This work will be done by ITDP consultants Michael King or Michael Molle in cooperation with the Foundation for the Country that we Want, which includes the designers of Bogota's bicycle and pedestrian facilities.

The total GEF contribution is only $200,000 out of a very large project, but as it will fund the continuing involvement of leading technical experts this modest involvement will ensure a top quality design and the integration of NMT facilities into the designs.

### 2.4.3. BRT Planning Guide

The Planning Guide will be compiled, edited, and large sections will be written by Lloyd Wright of UCL, with support from Walter Hook and Karl Fjellstrom of ITDP. The following sub-contracts will be issued to technical teams:

- Planning for BRT Regulatory Authorities and Their Role (Akiris or Sandoval & Co)
- Background for the Planning and Design Team and Their Role (SDG, Logit, or Logitrans)
- Background for Management Consultants and Their Role (Vlasak & Co, ITDP staff)
- Integration with Non-Motorized Modes (Michael King, Foundation for the Country We Want)
- Background on System Operations: The role of the operator and the regulator (Si 99/Akiris)
- Financing Options for BRT Systems (Vlasak & Co, ITDP staff)
- Aesthetic Issues

$215,000 of the total financing for the BRT Planning Guide has already been secured by ITDP from the Hewlett Foundation. The contribution of the UNEP GEF grant would be to go into much greater depth in the Planning and Design Team section. More details are available in Appendix 2.

## 2.5. Sustainability analysis and risk assessment

### 2.5.1. Project sustainability after implementation: financial terms

It is imperative that BRT systems are properly designed not only from a physical perspective but also from an institutional and legal perspective in order to ensure they are financially sustainable. Any BRT corridor with transit demand over 8,000 passengers per peak hour per direction (pphpd) can be made financially self-sufficient, but that is no guarantee that it will be. Simply building exclusive bus lanes will by no means guarantee financial sustainability. Curitiba achieved financial sustainability but at the cost of very high fares ($0.70). TransJakarta at this point is financed largely by government subsidies. Quito's electric trolley bus line has yet to achieve full financial sustainability. Bogota's TransMilenio achieved full financial sustainability not only by constructing exclusive bus lanes, but by re-routing regional transit systems to create a quasi-monopoly out of the trunk line operators, then contracting this monopoly concession out to multiple bidders through competitive tender. It is institutionally and legally complex to ensure that the private sector invests in the rolling stock and continues to invest in the maintenance of the rolling stock. Part of the genius of the TransMilenio system was the financing scheme that ensured that sufficient revenues for maintaining the system's stations and infrastructure were returned to the operating authority (TransMilenio). It is for this reason that this UNEP GEF project will focus on the critical legal and institutional structures in the Dar es Salaam BRT project that have thus far not been addressed from other sources of financing.

In the Cartagena project, while the funds are there for the BRT project, and local expertise is readily available due to proximity to Bogota, there is a significant risk that without the GEF project, construction funds for the NMT aspect of the project will not be included in the World Bank loan request.

There is no issue of financial sustainability with regard to the BRT Planning Guide after project completion, as the materials will be widely available to the public.

### 2.5.2. Project sustainability after implementation: institutional terms

A key outcome of the BRT planning process in the demonstration cities, as occurred in Bogota, Colombia, will be the availability of a nucleus of professionals who have expertise in planning for a BRT system. This initial core team, who will consist primarily of the government officials involved in the core planning team, will it is hoped form the nucleus of a new professional regulator of the BRT system.

In Dar es Salaam, for example, there is currently no professional regulator of bus services (there is only a licensing authority), and there is no institution which plans bus services, or adjusts serices to better meet demand. Into this institutional vacuum will step the new professional regulator which will be formally formed before the implementation of the first BRT line. This new professional regulator, which is likely to be a semi-autonomous body under the DCC, will ensure institutional sustainability of the BRT plans in Dar es Salaam.

Similarly in Cartagena, the initial core team which leads the planning process will provide the nucleus of a sustainable institutional framework for BRT in the demonstration cities.

### 2.5.3. Risk analysis and management

In Dar es Salaam, the biggest risk is that the current political will of the Mayor will be lost if significant progress is not demonstrated to the public by the end of his term at the end of 2005. The Mayor has staked his career on the success of this project. If this project does not move now, it will be lost. ITDP has spent extensive unrestricted resources mobilizing the support of the World Bank and US AID and from UNEP GEF to be available in a timely manner.

Another major risk in Dar es Salaam is that significant technical mistakes will be made given the short time frame that the Mayor has outlined. This risk has been greatly mitigated by the involvement of the World Bank, by our involvement in encouraging bids from competent firms, by having qualified experts on the review committee, and because of the availability of considerably greater planning resources than we had originally anticipated.

Another significant risk is that the project development in Dar will be done only by foreigners without training local experts, and hence the opportunity to develop a set of lasting technical skills that will be retained by experts working for the Dar City Council could be lost. For this reason, a significant focus of this project will be to build local planning capacity.

In Cartagena, there is a significant risk that the municipality will not invest sufficient resources into the planning of the system, not only for the completion of the physical designs but more importantly for the institutional structures. Our involvement in this project would diminish this risk.

Another significant risk is that the importance of NMT as a feeder system will be lost, and the modal split benefits of a shift to NMT will be lost. Again, the involvement of the persuasive Mayor Penalosa on the team will help considerably to keep this matter in the public eye.

## 2.6. Stakeholder involvement and social assessment

### 2.6.1. Dar es Salaam BRT Plan

ITDP staff conducted an evaluation visit to Dar es Salaam in August 2002, and a follow-up consultant team visit in May 2003. Consultant team members for the evaluation visits included Lloyd Wright (ITDP), Jarko Vlasek (McKinsey & Co.), Dario Hidalgo (TransMilenio S.A.), Paul White (ITDP), Karl Fjellstrom (ITDP), Danielle Wijnen and Tom Godefrooij (I-CE). Stakeholder involvement was elicited through a multi-stakeholder workshop on 12 - 13 May, meetings with the Mayor, City Director, and Deputy Mayor, a presentation to the City Council on 15th May, a press release (published virtually in full the following day in the leading English language daily) and numerous formal and informal meetings and discussions with a wide range of stakeholders.

Subsequently to and in the interval between the ITDP evaluation visits, intensive consultation has been conducted, led by a local NGO (AALOCOM), with several other stakeholders at the national, regional and city levels. In summary, key stakeholders involved with the project proposal development included:

- DCC leadership (City Director, Mayor, Deputy Mayor)
- DCC Councillors, from all of the three constituent municipal areas
- President's Office
- Ministry of Communications and Transport
- Tan Roads and the Ministry of Works
- Tanzania National Parliament

- AALOCOM, a local NGO promoting non-motorized and sustainable transport
- The Interface for Cycling Expertise, a Dutch NGO promoting cycling
- The Regional Licensing Authority (currently responsible for bus route licensing)
- A range of staff from various DCC divisions
- Local consultants (Transport Resource Centre Ltd)
- Locally based development organisations (JICA Tanzania Office)
- Higher education institutions (National Institute of Transport; University College of Lands and Architectural Studies)
- Transport operators and operators associations (incl. the Regional Bus Owners Association)
- The current public operator, UDA
- Tanzania Drivers Association.

### 2.6.2. Cartagena BRT Plan

Cartagena has already gone through a process of consultation and compromise and achieved broad agreement on its planned BRT system. Key stakholders are:

- Colombia Ministry of Planning
- Colombia Ministry of Treasury
- Colombia Ministry of Transportation
- Colombia Ministry of the Environment
- City Mayor's Office
- City Council
- City bus operators
- Association of Colombian Architects
- UNDP
- City Chamber of Commerce
- University of Cartagena.

An additional important stakeholder and potential source of funding in Cartagena is the World Bank. Currently the Bank is preparing a National Urban Transport Project, where Cartagena is included. Exact figures of costs of the specific projects are not yet available.

### 2.6.3. BRT Planning Guide

Intial work on the BRT Planning Guide proposal has been conducted by GTZ, resulting in a draft outline of a BRT plan. This involved securing the input of a range of stakeholders and contributors through wide circulation of the draft outline for review, including by:

- TransMilenio S.A.
- Government officials in Asia, Africa and Latin America
- World Bank staff
- A large number of international BRT and transportation consultants
- Non-government organisations
- Nationally based international development organisations.

Many of those involved in the review process of the draft outline had previously been involved with the implementation of successful BRT systems. This feedback and consultation was primarily achieved through Lloyd Wright, then with ITDP, who authored the draft outline.

## 3. INCREMENTAL COST ASSESSMENT

### INCREMENTAL COST MATRIX

| | Baseline | Alternative | Increment (Alternative-Baseline) |
|---|---|---|---|
| Global Environmental Benefits | Poor knowledge of BRT planning inhibits uptake of BRT, and poorly planned BRT systems do little to address declining mode shares of public transport. | Effective BRT planning leads to application of more and better BRT systems, with potential for further regional replication. | As a result of the construction of successful BRT and integrated NMT systems, roughly 430,000 metric tons of $CO_2$ emissions will be directly reduced in Dar es Salaam in the first year of BRT operation, with and annual reduction of approximately 1,119,000 metric tons of CO2 emissions by the fifth year of operation in 2010. In Cartagena approximately 63,000 metric tons of CO2 emissions will be reduced per year, beginning in the third year after project inception. This amount will increase in later years. For each additional 10 km of BRT and 50 km of NMT infrastructure in each city, another reduction of approximately 30,000 metric tons will be achieved, increasing in later years.<br><br>Because the cost of BRT and NMT planning will be cut by 50%, the BRT systems currently being developed in several other cities can be expanded much more quickly. The cities directly affected will be Dakar, Accra, Nairobi, Kampala, Cape Town, Delhi, Jakarta, Dhaka, Hyderabad, and Mexico City. This will yield a savings of roughly $2 million per city, or $20 million. This is roughly 10 km of BRT and 50 km of NMT facilities, the benefit of which is estimated at 30,000 metric tons of $CO_2$ emission reduction per year, increasing in later years. |
| Domestic Benefits | Gradually declining mode shares of public transport leads to steadily eroding benefits of existing high ridership on public transport in most developing cities.<br><br>Poorly planned BRT systems fail to halt the general decline of public transport relative to private modes by about 0.5% to 2% per year.<br><br>Limited awareness of BRT planning, achieved through existing planning tools, has some positive impact. | Implementation of more, and better planned, BRT systems leads to stabilisation or reversal of current trends away from public transport<br><br>Well-planned BRT systems increase likelihood of successful implementation, leading to regional replication.<br><br>Existing BRT planning informational tools, available in outline, are greatly enhanced, further reducing barriers to BRT viability. | The increment is measured by the positive impact on modal split of public transport, moving from a situation of mode split decline, to stabilisation or increases of mode split for public transport.<br><br>Multiple domestic benefits are achievable through such an influence on public transport, including reduced congestion and accidents, less air pollution and noise, better city economies, more healthy lifestyles, more efficient supply chains, reduced energy dependency on fossil fuels, and reduced transport burden on the urban poor. |

| Activities | Baseline costs ($) | Alternative costs ($) | Incremental costs ($) | | |
|---|---|---|---|---|---|
| | | | Total | GEF component | Co-financing |
| 1. BRT Plan in Dar es Salaam | 1,900,676 | 2,390,121 | 489,445 | 489,445 | 0* |
| 2. BRT plan in Cartagena | 737,230 | 1,065,580 | 328,350 | 189,850 | 138,500* |
| 3. BRT Planning Guide | 223,458 | 268,758 | 45,300 | 45,300 | 0* |
| **Total for all activities ($)** | 2,861,364 | 3,724,459 | 863,095 | 724,595 | 138,500 |

* Substantial co-financing, already committed regardless of GEF financing, is included as part of the 'baseline costs'.

** Not including the $25,000 PDF A funding from UNEP or 28,500 PDF A funding from ITDP

# 4. PROJECT BUDGET

## 4.1. BRT plan in Dar es Salaam (USD)

(see following page)

| Dar es Salaam BRT Plan<br>Revenue Sources: GEF / Dar es Salaam City Council / I-ce / World Bank / ITDP | Budget summary by funding source | | | | | Totals |
|---|---|---|---|---|---|---|
| **10 *Project Personnel Component*** | **GEF** | **DCC** | **I-ce** | **World Bank** | **USAID (ITDP)** | |
| **1100 Project Personnel** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** |
| **1101 Municipal Staff** | | | | | | |
| Project Manager, Local staff | $0 | $60,000 | $0 | $0 | $0 | $60,000 |
| Project Coordinator, Local staff | $0 | $48,000 | $0 | $0 | $0 | $48,000 |
| Sr. Civil Engineer | $0 | $60,000 | $0 | $0 | $0 | $60,000 |
| Jr. Civil Engineer | $0 | $47,840 | $0 | $0 | $0 | $47,840 |
| Legal Advisor for the City | $0 | $59,800 | $0 | $0 | $0 | $59,800 |
| Sr. Traffic Engineer | $0 | $59,800 | $0 | $0 | $0 | $59,800 |
| Jr. Traffic Engineer | $0 | $47,840 | $0 | $0 | $0 | $47,840 |
| Transport Economist, Local staff | $0 | $45,448 | $0 | $0 | $0 | $45,448 |
| **1102 ITDP Staff** | | | | | | |
| Exec. Director (W. Hook) | $0 | $0 | $0 | $0 | $18,000 | $18,000 |
| Program Director (K. Fjellstrom) | $0 | $0 | $0 | $0 | $19,500 | $19,500 |
| Tanzania Project Director (A. Szasz) (A Brazilian BRT Survey expert) | $15,000 | $0 | $0 | $0 | $13,500 | $28,500 |
| **1199 Sub-Total** | $15,000 | $428,728 | $0 | $0 | $51,000 | $494,728 |
| **1200 Consultants** | | | | | | |
| **1202** NMT and Parking facilities designer (Michael King) | $27,000 | $0 | $0 | $0 | $0 | $27,000 |
| **1203** Local Surveyors | $0 | $50,000 | $0 | $0 | $0 | $50,000 |
| **1204** Landscape Designers | $0 | $10,000 | $0 | $0 | $0 | $10,000 |
| **1205** Project Evaluator | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| **1299 Sub-Total** | $31,500 | $60,000 | $0 | $0 | $0 | $91,500 |
| **1300 Administrative support** | | | | | | |
| **1301 Municipal Administrative staff** | | | | | | |
| Project Accountant, Local staff | $0 | $45,448 | $0 | $0 | $0 | $45,448 |
| GIS Technician, Local staff | $0 | $19,200 | $0 | $0 | $0 | $19,200 |
| Office Management Secretary, Local staff | $0 | $12,000 | $0 | $0 | $0 | $12,000 |
| Driver/Messenger, Local staff | $0 | $6,240 | $0 | $0 | $0 | $6,240 |
| Office Attendant, Local staff | $0 | $4,800 | $0 | $0 | $0 | $4,800 |
| **1302 ITDP Administative Staff** | $7,000 | $0 | $0 | $0 | $7,000 | $14,000 |
| **1399 Sub-Total** | $7,000 | $87,688 | $0 | $0 | $7,000 | $101,688 |
| **1600 Travel on Official Business** | | | | | | |
| **1601** Monitoring and evaluation | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **1602** Consultant and staff travel | $15,000 | $0 | $0 | $0 | $20,000 | $35,000 |
| **1603** Accommodation and per diem | $17,595 | $0 | $0 | $0 | $20,800 | $38,395 |
| **1699 Sub-Total** | $42,595 | $0 | $0 | $0 | $40,800 | $83,395 |
| **1999 Component Total** | $96,095 | $576,416 | $0 | $0 | $98,800 | $771,311 |
| **20 *Sub-Contract Component*** | | | | | | |
| **2100 Sub-contracts with cooperating agencies (UN Agency)** | | | | | | |
| **2101** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2102** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2199 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2200 Sub-contracts with supporting organisations (NGOs, Governments)** | | | | | | |
| **2201 AALOCOM (Tanzanian NGO Partner)** | $0 | $0 | $75,000 | $0 | $0 | $75,000 |
| A. Organizing stakeholders forum and dialog | $10,000 | $12,000 | $0 | $0 | $0 | $22,000 |
| B. Pedestrian and bicycle access plan | $3,750 | $0 | $0 | $0 | $0 | $3,750 |
| C. Promotion | $10,000 | $9,000 | $0 | $0 | $0 | $19,000 |
| **2202 Institute for Cycling Expertise : bicycle network plan and design** | $0 | $0 | $30,000 | $10,000 | $0 | $40,000 |
| **2299 Sub-Total** | $23,750 | $21,000 | $105,000 | $10,000 | $0 | $159,750 |
| **2300 Sub-contracts with commercial organisations** | | | | | | |
| **2301 Sub-Contract for Intl. BRT Institutional, Business, and Legal Support** | $127,600 | $0 | $0 | $0 | $0 | $127,600 |
| (Elibigle bidders: J.Vlasak (Colombia), Akiris (Colombia), Logitrans(Brazil) | $0 | $0 | $0 | $0 | $0 | $0 |
| A. BRT planning work plan | $6,400 | $0 | $0 | $0 | $0 | $6,400 |
| B. Institutional Structure proposal | $12,000 | $0 | $0 | $0 | $0 | $12,000 |
| C. Intl. Oversight of Financial and Business Plan | $25,000 | $0 | $0 | $0 | $0 | $25,000 |
| D. Intl. Support for participation, education, marketing, customer service plans | $30,000 | $0 | $0 | $0 | $0 | $30,000 |
| E. Identification and Advise on Negotiations w/ Bus Suppliers | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| F. Identification and Negotiations w/ fare collection | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| G. Identification and Negotiations w/ other suppliers | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| H. Implementation Timeline | $1,200 | $0 | $0 | $0 | $0 | $1,200 |
| I. Staffing plan | $4,000 | $0 | $0 | $0 | $0 | $4,000 |
| J. System maintenance & Customer Service plan | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| K. Construction Contract Tendering and Supervision, Intl. Assistance | $12,500 | $0 | $0 | $0 | $0 | $12,500 |
| Travel, Per Diems, and Overheads | $15,000 | $0 | $0 | $0 | $0 | $15,000 |
| **2302 Legal Council on Contracting, Regulations (Tanzanian bid)** | $51,000 | $0 | $0 | $0 | $0 | $51,000 |
| **2303 Financial and Business Plan - Tanzanian Firm (Tanzanian bid)** | $30,000 | $0 | $0 | $0 | $0 | $30,000 |
| **2304 BRT Transport Planning and Engineering (Tanzanian & Intl Consortium)** | $0 | $0 | $0 | $980,000 | $0 | $980,000 |
| A. Transport modelling (World Bank Tender) | $0 | $0 | $0 | $125,000 | $0 | $125,000 |
| B. Corridor location, Demand estimates, preliminary design (WB Tender) | $0 | $0 | $0 | $100,000 | $0 | $100,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| C. Bus Routing and Scheduling Restructuring (WB Tender) | $0 | $0 | $0 | $50,000 | $0 | $50,000 |
| D. Feeder System Design (WB Tender) | $0 | $0 | $0 | $25,000 | $0 | $25,000 |
| A. Road engineering and design, (WB Tender) | $0 | $0 | $0 | $250,000 | $0 | $250,000 |
| B. Signaling system design, (WB Tender) | $0 | $0 | $0 | $100,000 | $0 | $100,000 |
| C. Station and terminal design, (WB Tender) | $0 | $0 | $0 | $75,000 | $0 | $75,000 |
| D. Bus depot design, (WB Tender) | $0 | $0 | $0 | $50,000 | $0 | $50,000 |
| I. Landscape design and plans, | $0 | $0 | $0 | $25,000 | $0 | $25,000 |
| Travel, Per Diems, and Overheads | $0 | $0 | $0 | $180,000 | $0 | $180,000 |
| **2305 Public Relations (Tanzanian firm- Bid)** | $20,000 | $0 | $0 | $0 | $0 | $20,000 |
| **2399 Sub-Total** | $228,600 | $0 | $0 | $980,000 | $0 | $1,208,600 |
| **2999 Component Total** | $252,350 | $21,000 | $105,000 | $990,000 | $0 | $1,368,350 |
| **30 *Training Component*** | | | | | | |
| **3200 Group Training** | | | | | | |
| **3201** BRT survey training (Brazilian experts) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3202** Local University Experts for Training (Tanzanian) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3203** NMT faciliities training (intl. experts) | $9,000 | $0 | $0 | $0 | $0 | $9,000 |
| **3204** NMT facilities planning training (local NGO) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3205** BRT traffic modeling (Brazilian. Expert) | $9,000 | $0 | $0 | $0 | $0 | $9,000 |
| **3206** Transportation modelling training (local) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3207** Training for private bus operators in BRT operations (Brazilian Expert) | $22,500 | $20,000 | $0 | $0 | $0 | $42,500 |
| **3299 Sub-Total** | $80,500 | $20,000 | $0 | $0 | $0 | $100,500 |
| **3300 Meetings/Conferences** | | | | | | |
| **3301** Project launch conference | $0 | $3,000 | $0 | $0 | $0 | $3,000 |
| **3302** Public meetings | $0 | $6,000 | $0 | $0 | $0 | $6,000 |
| **3303** Steering committee meetings/Bus association meetings | $0 | $4,000 | $0 | $0 | $0 | $4,000 |
| **3304** BRT plan review seminar | $0 | $4,000 | $0 | $0 | $0 | $4,000 |
| **3305** Information dissemination with other cities; various forums | $38,500 | $0 | $0 | $0 | $0 | $0 |
| **3399 Sub-Total** | $38,500 | $17,000 | $0 | $0 | $0 | $55,500 |
| **3999 Component Total** | $119,000 | $37,000 | $0 | $0 | $0 | $156,000 |
| **40 *Equipment and Premises Component*** | | | | | | |
| **4100 Expendable Equipment** | | | | | | |
| **4101** Office Supplies | $0 | $6,000 | $0 | $0 | $0 | $6,000 |
| **4199 Sub-Total** | $0 | $6,000 | $0 | $0 | $0 | $6,000 |
| **4200 Equipment** | | | | | | |
| **4201** Traffic Modeling and GIS Software | $15,000 | $0 | $0 | $0 | $0 | $15,000 |
| **4202** Projector, Digitizer, other equipment for office | $5,000 | $0 | $0 | $0 | $0 | $5,000 |
| **4203** Computer hardware | $0 | $8,460 | $0 | $0 | $0 | $8,460 |
| **4204** Office equipment | $0 | $6,000 | $0 | $0 | $0 | $6,000 |
| **4299 Sub-Total** | $20,000 | $14,460 | $0 | $0 | $0 | $34,460 |
| **4300 Rental** | | | | | | |
| **4301** Office rental | $0 | $14,000 | $0 | $0 | $0 | $14,000 |
| **4399 Sub-Total** | $0 | $14,000 | $0 | $0 | $0 | $14,000 |
| **4999 Component Total** | $20,000 | $34,460 | $0 | $0 | $0 | $54,460 |
| **50 *Miscellaneous Component*** | | | | | | |
| **5100 Reporting Costs** | | | | | | |
| **5101** Copying/distribution of BRT plan (English) | $0 | $10,000 | $0 | $0 | $0 | $10,000 |
| **5102** Translation/copying/distribution (Swahili) | $0 | $10,000 | $0 | $0 | $0 | $10,000 |
| **5199 Sub-Total** | $0 | $20,000 | $0 | $0 | $0 | $20,000 |
| **5200 Sundry** | | | | | | |
| **5201** Communications ITDP: Fax/tel/email | $2,000 | $0 | $0 | $0 | $0 | $2,000 |
| **5202** Communications: Project web site | $0 | $8,000 | $0 | $0 | $0 | $8,000 |
| **5299 Sub-Total** | $2,000 | $8,000 | $0 | $0 | $0 | $10,000 |
| **5300 Hospitality & Entertainment** | | | | | | |
| **5301** | $0 | $0 | $0 | $0 | $0 | $0 |
| **5399 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| **5999 Component Total** | $2,000 | $28,000 | $0 | $0 | $0 | $30,000 |
| **Adjustment factor for WB loan funds (total $1m)** | | | | $10,000 | | $10,000 |
| **99 *Grand Total*** | **$489,445** | **$696,876** | **$105,000** | **$1,000,000** | **$98,800** | **$2,390,121** |

| Dar es Salaam BRT Plan<br>Revenue Sources: GEF / Dar es Salaam City Council / I-ce / World Bank / ITDP | Budget summary by project year | | | | | Totals |
|---|---|---|---|---|---|---|
| **10** ***Project Personnel Component*** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | |
| **1100 Project Personnel** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** |
| **1101 Municipal Staff** | | | | | | |
| Project Manager, Local staff | $30,000 | $30,000 | $0 | $0 | $0 | $60,000 |
| Project Coordinator, Local staff | $24,000 | $24,000 | $0 | $0 | $0 | $48,000 |
| Sr. Civil Engineer | $30,000 | $30,000 | $0 | $0 | $0 | $60,000 |
| Jr. Civil Engineer | $23,920 | $23,920 | $0 | $0 | $0 | $47,840 |
| Legal Advisor for the City | $29,900 | $29,900 | $0 | $0 | $0 | $59,800 |
| Sr. Traffic Engineer | $29,900 | $29,900 | $0 | $0 | $0 | $59,800 |
| Jr. Traffic Engineer | $23,920 | $23,920 | $0 | $0 | $0 | $47,840 |
| Transport Economist, Local staff | $22,724 | $22,724 | $0 | $0 | $0 | $45,448 |
| **1102 ITDP Staff** | | | | | | |
| Exec. Director (W. Hook) | $18,000 | $0 | $0 | $0 | $0 | $18,000 |
| Program Director (K. Fjellstrom) | $19,500 | $0 | $0 | $0 | $0 | $19,500 |
| Tanzania Project Director (A. Szasz) (A Brazilian BRT Survey expert) | $28,500 | $0 | $0 | $0 | $0 | $28,500 |
| **1199 Sub-Total** | $280,364 | $214,364 | $0 | $0 | $0 | $494,728 |
| **1200 Consultants** | | | | | | |
| **1202** NMT and Parking facilities designer (Michael King) | $27,000 | $0 | $0 | $0 | $0 | $27,000 |
| **1203** Local Surveyors | $25,000 | $25,000 | $0 | $0 | $0 | $50,000 |
| **1204** Landscape Designers | $5,000 | $5,000 | $0 | $0 | $0 | $10,000 |
| **1205** Project Evaluator | $4,500 | | $0 | $0 | $0 | $4,500 |
| **1299 Sub-Total** | $61,500 | $30,000 | $0 | $0 | $0 | $91,500 |
| **1300 Administrative support** | | | | | | |
| **1301 Municipal Administrative staff** | | | | | | |
| Project Accountant, Local staff | $22,724 | $22,724 | $0 | $0 | $0 | $45,448 |
| GIS Technician, Local staff | $9,600 | $9,600 | $0 | $0 | $0 | $19,200 |
| Office Management Secretary, Local staff | $6,000 | $6,000 | $0 | $0 | $0 | $12,000 |
| Driver/Messenger, Local staff | $3,120 | $3,120 | $0 | $0 | $0 | $6,240 |
| Office Attendant, Local staff | $2,400 | $2,400 | $0 | $0 | $0 | $4,800 |
| **1302 ITDP Administative Staff** | $14,000 | $0 | $0 | $0 | $0 | $14,000 |
| **1399 Sub-Total** | $57,844 | $43,844 | $0 | $0 | $0 | $101,688 |
| **1600 Travel on Official Business** | | | | | | |
| **1601** Monitoring and evaluation | $2,500 | $2,500 | $2,500 | $2,500 | $0 | $10,000 |
| **1602** Consultant and staff travel | $35,000 | $0 | $0 | $0 | $0 | $35,000 |
| **1603** Accommodation and per diem | $38,395 | $0 | $0 | $0 | $0 | $38,395 |
| **1699 Sub-Total** | $75,895 | $2,500 | $2,500 | $2,500 | $0 | $83,395 |
| **1999 Component Total** | $475,603 | $290,708 | $2,500 | $2,500 | $0 | $771,311 |
| **20** ***Sub-Contract Component*** | | | | | | |
| **2100 Sub-contracts with cooperating agencies (UN Agency)** | | | | | | |
| **2101** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2102** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2199 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| **2200 Sub-contracts with supporting organisations (NGOs, Governments)** | | | | | | |
| **2201 AALOCOM (Tanzanian NGO Partner)** | $15,000 | $15,000 | $15,000 | $15,000 | $15,000 | $75,000 |
| A. Organizing stakeholders forum and dialog | $16,000 | $6,000 | $0 | $0 | $0 | $22,000 |
| B. Pedestrian and bicycle access plan | $3,750 | $0 | $0 | $0 | $0 | $3,750 |
| C. Promotion | $14,500 | $4,500 | $0 | $0 | $0 | $19,000 |
| **2202 Institute for Cycling Expertise : bicycle network plan and design** | $20,000 | $5,000 | $5,000 | $5,000 | $5,000 | $40,000 |
| **2299 Sub-Total** | $69,250 | $30,500 | $20,000 | $20,000 | $20,000 | $159,750 |
| **2300 Sub-contracts with commercial organisations** | | | | | | |
| **2301 Sub-Contract for Intl. BRT Institutional, Business, and Legal Support** | $109,400 | $18,200 | $0 | $0 | $0 | $127,600 |
| (Elibigle bidders: J.Vlasak (Colombia), Akiris (Colombia), Logitrans(Brazil) | $0 | $0 | $0 | $0 | $0 | $0 |
| A. BRT planning work plan | $3,200 | $3,200 | $0 | $0 | $0 | $6,400 |
| B. Institutional Structure proposal | $12,000 | $0 | $0 | $0 | $0 | $12,000 |
| C. Intl. Oversight of Financial and Business Plan | $25,000 | $0 | $0 | $0 | $0 | $25,000 |
| D. Intl. Support for participation, education, marketing, customer service plans | $15,000 | $15,000 | $0 | $0 | $0 | $30,000 |
| E. Identification and Advise on Negotiations w/ Bus Suppliers | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| F. Identification and Negotiations w/ fare collection | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| G. Identification and Negotiations w/ other suppliers | $4,500 | $0 | $0 | $0 | $0 | $4,500 |
| H. Implementation Timeline | $1,200 | $0 | $0 | $0 | $0 | $1,200 |
| I. Staffing plan | $4,000 | $0 | $0 | $0 | $0 | $4,000 |
| J. System maintenance & Customer Service plan | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| K. Construction Contract Tendering and Supervision, Intl. Assistance | $12,500 | $0 | $0 | $0 | $0 | $12,500 |
| Travel, Per Diems, and Overheads | $15,000 | $0 | $0 | $0 | $0 | $15,000 |
| **2302 Legal Council on Contracting, Regulations (Tanzanian bid)** | $51,000 | $0 | $0 | $0 | $0 | $51,000 |
| **2303 Financial and Business Plan - Tanzanian Firm (Tanzanian bid)** | $30,000 | $0 | $0 | $0 | $0 | $30,000 |
| **2304 BRT Transport Planning and Engineering (Tanzanian & Intl Consortium)** | $980,000 | $0 | $0 | $0 | $0 | $980,000 |
| A. Transport modelling (World Bank Tender) | $125,000 | $0 | $0 | $0 | $0 | $125,000 |
| B. Corridor location, Demand estimates, preliminary design (WB Tender) | $100,000 | $0 | $0 | $0 | $0 | $100,000 |
| C. Bus Routing and Scheduling Restructuring (WB Tender) | $50,000 | $0 | $0 | $0 | $0 | $50,000 |
| D. Feeder System Design (WB Tender) | $25,000 | $0 | $0 | $0 | $0 | $25,000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | A. Road engineering and design, (WB Tender) | $250,000 | $0 | $0 | $0 | $0 | $250,000 |
| | B. Signaling system design, (WB Tender) | $100,000 | $0 | $0 | $0 | $0 | $100,000 |
| | C. Station and terminal design, (WB Tender) | $75,000 | $0 | $0 | $0 | $0 | $75,000 |
| | D. Bus depot design, (WB Tender) | $50,000 | $0 | $0 | $0 | $0 | $50,000 |
| | I. Landscape design and plans, | $25,000 | $0 | $0 | $0 | $0 | $25,000 |
| | Travel, Per Diems, and Overheads | $180,000 | $0 | $0 | $0 | $0 | $180,000 |
| **2305** | **Public Relations (Tanzanian firm- Bid)** | $10,000 | $10,000 | $0 | $0 | $0 | $20,000 |
| **2399** | **Sub-Total** | $1,180,400 | $28,200 | $0 | $0 | $0 | $1,208,600 |
| **2999** | **Component Total** | $1,249,650 | $58,700 | $20,000 | $20,000 | $20,000 | $1,368,350 |
| **30** | ***Training Component*** | | | | | | |
| **3200** | **Group Training** | | | | | | |
| **3201** | BRT survey training (Brazilian experts) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3202** | Local University Experts for Training (Tanzanian) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3203** | NMT faciliities training (intl. experts) | $9,000 | $0 | $0 | $0 | $0 | $9,000 |
| **3204** | NMT facilities planning training (local NGO) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3205** | BRT traffic modeling (Brazilian. Expert) | $9,000 | $0 | $0 | $0 | $0 | $9,000 |
| **3206** | Transportation modelling training (local) | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **3207** | Training for private bus operators in BRT operations (Brazilian Expert) | $32,500 | $10,000 | $0 | $0 | $0 | $42,500 |
| **3299** | **Sub-Total** | $90,500 | $10,000 | $0 | $0 | $0 | $100,500 |
| **3300** | **Meetings/Conferences** | | | | | | |
| **3301** | Project launch conference | $3,000 | $0 | $0 | $0 | $0 | $3,000 |
| **3302** | Public meetings | $3,000 | $3,000 | $0 | $0 | $0 | $6,000 |
| **3303** | Steering committee meetings/Bus association meetings | $2,000 | $2,000 | $0 | $0 | $0 | $4,000 |
| **3304** | BRT plan review seminar | $2,000 | $2,000 | $0 | $0 | $0 | $4,000 |
| **3305** | Information dissemination with other cities; various forums | $7,000 | $9,000 | $7,500 | $7,500 | $7,500 | $38,500 |
| **3399** | **Sub-Total** | $17,000 | $16,000 | $7,500 | $7,500 | $7,500 | $55,500 |
| **3999** | **Component Total** | $107,500 | $26,000 | $7,500 | $7,500 | $7,500 | $156,000 |
| **40** | ***Equipment and Premises Component*** | | | | | | |
| **4100** | **Expendable Equipment** | | | | | | |
| **4101** | Office Supplies | $3,000 | $3,000 | $0 | $0 | $0 | $6,000 |
| **4199** | **Sub-Total** | $3,000 | $3,000 | $0 | $0 | $0 | $6,000 |
| **4200** | **Equipment** | | | | | | |
| **4201** | Traffic Modeling and GIS Software | $15,000 | $0 | $0 | $0 | $0 | $15,000 |
| **4202** | Projector, Digitizer, other equipment for office | $5,000 | $0 | $0 | $0 | $0 | $5,000 |
| **4203** | Computer hardware | $4,230 | $4,230 | $0 | $0 | $0 | $8,460 |
| **4204** | Office equipment | $3,000 | $3,000 | $0 | $0 | $0 | $6,000 |
| **4299** | **Sub-Total** | $27,230 | $7,230 | $0 | $0 | $0 | $34,460 |
| **4300** | **Rental** | | | | | | |
| **4301** | Office rental | $7,000 | $7,000 | $0 | $0 | $0 | $14,000 |
| **4399** | **Sub-Total** | $7,000 | $7,000 | $0 | $0 | $0 | $14,000 |
| **4999** | **Component Total** | $37,230 | $17,230 | $0 | $0 | $0 | $54,460 |
| **50** | ***Miscellaneous Component*** | | | | | | |
| **5100** | **Reporting Costs** | | | | | | |
| **5101** | Copying/distribution of BRT plan (English) | $5,000 | $5,000 | $0 | $0 | $0 | $10,000 |
| **5102** | Translation/copying/distribution (Swahili) | $5,000 | $5,000 | $0 | $0 | $0 | $10,000 |
| **5199** | **Sub-Total** | $10,000 | $10,000 | $0 | $0 | $0 | $20,000 |
| **5200** | **Sundry** | | | | | | |
| **5201** | Communications ITDP: Fax/tel/email | $2,000 | $0 | $0 | $0 | $0 | $2,000 |
| **5202** | Communications: Project web site | $4,000 | $4,000 | $0 | $0 | $0 | $8,000 |
| **5299** | **Sub-Total** | $6,000 | $4,000 | $0 | $0 | $0 | $10,000 |
| **5300** | **Hospitality & Entertainment** | | | | | | |
| **5301** | | $0 | $0 | $0 | $0 | $0 | $0 |
| **5399** | **Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| **5999** | **Component Total** | $16,000 | $14,000 | $0 | $0 | $0 | $30,000 |
| | **Adjustment factor for WB loan funds (total $1m)** | | | | | | |
| **99** | ***Grand Total*** | **$1,895,983** | **$406,638** | **$30,000** | **$30,000** | **$27,500** | **$2,390,121** |

## 4.2. BRT/NMT plan in Cartagena (USD)

(See following page)

| Cartagena BRT Plan<br>Revenue Sources: GEF / City of Cartagena / National Government / CIM / GTZ | Budget summary by funding source | | | | Totals |
|---|---|---|---|---|---|
| **10 *Project Personnel Component*** | **GEF** | **City of Cartagena** | **CIM** | **GTZ** | |
| **1100 Project Personnel** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** |
| **1101** Project Manager, Local staff | $0 | $132,000 | $0 | $0 | $132,000 |
| Project Transport Specialist | $0 | $0 | $195,000 | $0 | $195,000 |
| Transport Economist, Local staff | $0 | $93,000 | $0 | $0 | $93,000 |
| Project Accountant, Local staff | $0 | $24,000 | $0 | $0 | $24,000 |
| Technical Assistant, Local staff | $0 | $30,000 | $0 | $0 | $30,000 |
| | $0 | $0 | $0 | $0 | $0 |
| ITDP Staff | | | | | |
| Exec. Director (W. Hook) | $8,000 | $0 | $0 | $0 | $8,000 |
| Latin America Regional Director (O. Diaz) | $18,900 | $0 | $0 | $0 | $18,900 |
| **1199 Sub-Total** | $26,900 | $279,000 | $195,000 | $0 | $500,900 |
| **1200 Consultants** | | | | | |
| **1201** Activity 1. Project work plan and timeline | | | | | |
| A. BRT planning, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| B. Work plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| **1202** Activity 2. Planning analysis | | | | | |
| A. Data collection (origin-destination, supply/demand, etc.) | $0 | $0 | $0 | $0 | $0 |
| B. Transport modelling, International and Local Consultants | $0 | $0 | $0 | $10,000 | $10,000 |
| **1203** Activity 3. Regulatory, legal, administrative, and business structure | | $0 | | | |
| A. Structure development, Escallón and Associates | $0 | $0 | $0 | $0 | $0 |
| B. Negotiations with existing bus operators, Escallón and Associates | $0 | $0 | $0 | $0 | $0 |
| **1204** Activity 4. Communications and customer service | | | | | |
| A. Public participation process, Local consultants | $0 | $1,000 | $0 | $0 | $1,000 |
| B. Public education plan | $1,000 | $1,500 | $0 | $0 | $2,500 |
| C. Customer service plan | $1,000 | $1,500 | $0 | $0 | $2,500 |
| D. Marketing plan | $0 | $1,500 | $0 | $0 | $1,500 |
| E. Customer service and marketing plan | $3,000 | $0 | $0 | $0 | $3,000 |
| **1205** Activity 5. Operational Design Study | | | | | |
| A. Final Operational Design | $15,000 | $0 | $0 | $0 | $15,000 |
| B. Work plan, Local consultants | $0 | $3,000 | $0 | $0 | $3,000 |
| **1206** Activity 6. Infrastructure | | | | | |
| A. Road engineering and design | $0 | $70,000 | $0 | $0 | $70,000 |
| B. Traffic light system integration | $0 | $0 | $0 | $0 | $0 |
| C. Station and terminal design | $0 | $0 | $0 | $0 | $0 |
| D. Road engineering, design, signaling, stations | $0 | $0 | $0 | $0 | $0 |
| E. Landscape designs | $0 | $92,500 | $0 | $0 | $92,500 |
| F. Pedestrian access and intersection design, ITDP (Michael King) | $6,000 | $0 | $0 | $0 | $6,000 |
| **1207** Activity 7. Technology selection and terms of reference | | | | | |
| A. Fare collection and fare verification systems | $0 | $0 | $0 | $0 | $0 |
| B. Bus technology selection | $0 | $0 | $0 | $0 | $0 |
| C. Intelligent transportation systems | $0 | $0 | $0 | $0 | $0 |
| D. Technology selection consultation | $0 | $1,400 | $0 | $0 | $1,400 |
| E. Technology selection and terms of reference | $0 | $6,000 | $0 | $0 | $6,000 |
| F. Equipment terms of references and procurement process, Escallón | $0 | $0 | $0 | $0 | $0 |
| **1208** Activity 8. Modal integration plan | | | | | |
| A. Pedestrian integration | $8,000 | $0 | $0 | $0 | $8,000 |
| B. Bicycle integration | $8,000 | $0 | $0 | $0 | $8,000 |
| **1209** Activity 9. Impact analysis | | | | | |
| A. Traffic impact analysis, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| B. Traffic impacts analysis, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| C. Environmental, economic, social impact analyses; STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| D. Environmental, economic, social impact analyses | $2,800 | $0 | $0 | $0 | $2,800 |
| E. Environmental, economic and social impact analyses; Local consultants | $0 | $8,000 | $0 | $0 | $8,000 |
| **1210** Activity 10. Implementation planning | | | | | |
| A. Timeline and work plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| B. Financing plan, Escallón and Associates | $0 | $0 | $0 | $0 | $0 |
| C. Staffing plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| D. Contracting plan, Escallón and Associates | $0 | $0 | $0 | $0 | $0 |
| E. Monitoring and evaluation plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 |
| G. Implementation planning, Local consultants | $0 | $4,000 | $0 | $0 | $4,000 |
| **1299 Sub-Total** | $44,800 | $190,400 | $0 | $10,000 | $245,200 |
| **1300 Administrative support** | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1301** | Administrative staff | $0 | $2,000 | $0 | $0 | $2,000 |
| | Secretary, Local staff | $0 | $14,400 | $0 | $0 | $14,400 |
| | Support Staff, Local | $0 | $13,200 | $0 | $0 | $13,200 |
| | ITDP Administrative Staff | $5,700 | $0 | $0 | $0 | $5,700 |
| **1399** | **Sub-Total** | $5,700 | $29,600 | $0 | $0 | $35,300 |
| **1600** | **Travel on Official Business** | | | | | |
| **1601** | Monitoring and evaluation missions | $4,500 | $2,000 | $0 | $0 | $6,500 |
| **1602** | Consultant and staff travel | $17,250 | $4,000 | $0 | $0 | $21,250 |
| **1603** | Accommodation and per diem | $21,200 | $0 | $0 | $0 | $21,200 |
| **1699** | **Sub-Total** | $42,950 | $6,000 | $0 | $0 | $48,950 |
| **1999** | **Component Total** | $120,350 | $505,000 | $195,000 | $10,000 | $830,350 |
| **20** | ***Sub-Contract Component*** | | | | | |
| **2100** | **Sub-contracts with cooperating agencies (UN Agency)** | | | | | |
| **2101** | | $0 | $0 | $0 | $0 | $0 |
| **2102** | | $0 | $0 | $0 | $0 | $0 |
| **2199** | **Sub-Total** | $0 | $0 | $0 | $0 | $0 |
| **2200** | **Sub-contracts with supporting organisations (NGOs, Governments)** | | | | | |
| | Por el País que Queremos (For the Country that we Want) | | | | | |
| | A. Organizing stakeholders forum and dialogue | $3,000 | $0 | $0 | $0 | $3,000 |
| | B. Pedestrian and bicycle integration with BRT system | $18,000 | $0 | $0 | $0 | $18,000 |
| **2201** | C. Promotion | $12,000 | $0 | $0 | $0 | $12,000 |
| **2202** | D. Revision and evaluation | $10,000 | $0 | $0 | $0 | $10,000 |
| **2299** | **Sub-Total** | $43,000 | $0 | $0 | $0 | $43,000 |
| **2300** | **Sub-contracts with commercial organisations** | | | | | |
| **2301** | | $0 | $0 | $0 | $0 | $0 |
| **2302** | | $0 | $0 | $0 | $0 | $0 |
| **2399** | **Sub-Total** | $0 | $0 | $0 | $0 | $0 |
| **2999** | **Component Total** | $43,000 | $0 | $0 | $0 | $43,000 |
| **30** | ***Training Component*** | | | | | |
| **3200** | **Group Training** | | | | | |
| **3201** | BRT planning training | $0 | $0 | $0 | $75,000 | $75,000 |
| | NMT Training (national and international experts) | $4,500 | $0 | $0 | $0 | $4,500 |
| **3202** | Public participation training | $0 | $0 | $0 | $25,000 | $25,000 |
| **3299** | **Sub-Total** | $4,500 | $0 | $0 | $100,000 | $104,500 |
| **3300** | **Meetings/Conferences** | | | | | |
| **3301** | Conference | $2,500 | $0 | $0 | $22,500 | $25,000 |
| **3302** | Public meetings | $0 | $0 | $0 | $0 | $0 |
| **3303** | Steering committee meetings/Bus association meetings | $0 | $0 | $0 | $0 | $0 |
| **3304** | BRT plan review seminar | $0 | $0 | $0 | $0 | $0 |
| **3399** | **Sub-Total** | $2,500 | $0 | $0 | $22,500 | $25,000 |
| **3999** | **Component Total** | $7,000 | $0 | $0 | $122,500 | $129,500 |
| **40** | ***Equipment and Premises Component*** | | | | | |
| **4100** | **Expendable Equipment** | | | | | |
| **4101** | Office Supplies | $0 | $15,000 | $0 | $0 | $15,000 |
| **4102** | Software | $12,000 | $5,000 | $0 | $0 | $17,000 |
| **4199** | **Sub-Total** | $12,000 | $20,000 | $0 | $0 | $32,000 |
| **4200** | | | | | | |
| **4201** | Computer hardware | $0 | $6,730 | $0 | $0 | $6,730 |
| **4202** | Office equipment | $0 | $7,000 | $0 | $0 | $7,000 |
| **4299** | **Sub-Total** | $0 | $13,730 | $0 | $0 | $13,730 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4300** | | | | | | |
| | **4301** Office rental | $0 | $0 | $0 | $0 | $0 |
| | **4399 Sub-Total** | $0 | $0 | $0 | $0 | $0 |
| **4999** | **Component Total** | $12,000 | $33,730 | $0 | $0 | $45,730 |
| **50** | ***Miscellaneous Component*** | | | | | |
| **5100** | **Reporting Costs** | | | | | |
| | **5101** Copying/distribution of BRT plan (English) | $5,000 | $0 | $0 | $0 | $5,000 |
| | **5102** Translation/copying/distribution (German) | $0 | $0 | $0 | $6,000 | $6,000 |
| | **5199 Sub-Total** | $5,000 | $0 | $0 | $6,000 | $11,000 |
| **5200** | **Sundry** | | | | | |
| | **5201** Communications ITDP: Fax/tel/email | $2,500 | $0 | $0 | $0 | $2,500 |
| | **5202** Communications: Project web site | $0 | $3,500 | $0 | $0 | $3,500 |
| | **5299 Sub-Total** | $2,500 | $3,500 | $0 | $0 | $6,000 |
| **5300** | **Hospitality & Entertainment** | | | | | |
| | **5301** | $0 | $0 | $0 | $0 | $0 |
| | **5399 Sub-Total** | $0 | $0 | $0 | $0 | $0 |
| **5999** | **Component Total** | $7,500 | $3,500 | $0 | $6,000 | $17,000 |
| **99** | ***Grand Total*** | **$189,850** | **$542,230** | **$195,000** | **$138,500** | **$1,065,580** |

| Cartagena BRT Plan<br>Revenue Sources: GEF / City of Cartagena / CIM / GTZ | Budget Summary by Project Year | | | | | |
|---|---|---|---|---|---|---|
| **10 *Project Personnel Component*** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Totals** |
| **1100 Project Personnel** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** | **Total (in US$)** |
| **1101** Project Manager, Local staff | $26,400 | $26,400 | $26,400 | $26,400 | $26,400 | $132,000 |
| Project Transport Specialist | $60,000 | $60,000 | $30,000 | $30,000 | $15,000 | $195,000 |
| Transport Economist, Local staff | $21,600 | $21,600 | $21,600 | $21,600 | $6,600 | $93,000 |
| Project Accountant, Local staff | $4,800 | $4,800 | $4,800 | $4,800 | $4,800 | $24,000 |
| Technical Assistant, Local staff | $12,000 | $12,000 | $6,000 | $0 | $0 | $30,000 |
| ITDP Staff | | | | | | |
| Exec. Director (W. Hook) | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| Latin America Regional Director (O. Diaz) | $12,000 | $3,000 | $1,500 | $1,500 | $900 | $18,900 |
| **1199 Sub-Total** | $144,800 | $127,800 | $90,300 | $84,300 | $53,700 | $500,900 |
| **1200 Consultants** | | | | | | |
| **1201** Activity 1. Project work plan and timeline | | | | | | |
| A. BRT planning, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Work plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| **1202** Activity 2. Planning analysis | | | | | | |
| A. Data collection (origin-destination, supply/demand, etc.) | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Transport modelling, International and Local Consultants | $10,000 | $0 | $0 | $0 | $0 | $10,000 |
| **1203** Activity 3. Regulatory, legal, administrative, and business structure | | | | | | |
| A. Structure development, Escallón and Associates | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Negotiations with existing bus operators, Escallón and Associates | $0 | $0 | $0 | $0 | $0 | $0 |
| **1204** Activity 4. Communications and customer service | | | | | | |
| A. Public participation process, Local consultants | $0 | $1,000 | $0 | $0 | $0 | $1,000 |
| B. Public education plan | $0 | $2,500 | $0 | $0 | $0 | $2,500 |
| C. Customer service plan | $0 | $2,500 | $0 | $0 | $0 | $2,500 |
| D. Marketing plan | $0 | $1,500 | $0 | $0 | $0 | $1,500 |
| E. Customer service and marketing plan | $0 | $1,000 | $0 | $2,000 | $0 | $3,000 |
| **1205** Activity 5. Operational Design Study | | | | | | |
| A. Final Operational Design | $15,000 | $0 | $0 | $0 | $0 | $15,000 |
| B. Work plan, Local consultants | $3,000 | $0 | $0 | $0 | $0 | $3,000 |
| **1206** Activity 6. Infrastructure | | | | | | |
| A. Road engineering and design | $0 | $70,000 | $0 | $0 | $0 | $70,000 |
| B. Traffic light system integration | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Station and terminal design | $0 | $0 | $0 | $0 | $0 | $0 |
| D. Road engineering, design, signaling, stations | $0 | $0 | $0 | $0 | $0 | $0 |
| E. Landscape designs | $62,500 | $30,000 | $0 | $0 | $0 | $92,500 |
| F. Pedestrian access and intersection design, ITDP (Michael King) | $6,000 | $0 | $0 | $0 | $0 | $6,000 |
| **1207** Activity 7. Technology selection and terms of reference | $0 | $0 | $0 | $0 | $0 | $0 |
| A. Fare collection and fare verification systems | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Bus technology selection | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Intelligent transportation systems | $0 | $0 | $0 | $0 | $0 | $0 |
| D. Technology selection consultation | $1,400 | $0 | $0 | $0 | $0 | $1,400 |
| E. Technology selection and terms of reference | $6,000 | $0 | $0 | $0 | $0 | $6,000 |
| F. Equipment terms of references and procurement process, Escallón | $0 | $0 | $0 | $0 | $0 | $0 |
| **1208** Activity 8. Modal integration plan | | | | | | |
| A. Pedestrian integration | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| B. Bicycle integration | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| **1209** Activity 9. Impact analysis | | | | | | |
| A. Traffic impact analysis, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Traffic impacts analysis, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Environmental, economic, social impact analyses; STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| D. Environmental, economic, social impact analyses | $2,800 | $0 | $0 | $0 | $0 | $2,800 |
| E. Environmental, economic and social impact analyses; Local consultant | $8,000 | $0 | $0 | $0 | $0 | $8,000 |
| **1210** Activity 10. Implementation planning | | | | | | |
| A. Timeline and work plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| B. Financing plan, Escallón and Associates | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Staffing plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| D. Contracting plan, Escallón and Associates | $0 | $0 | $0 | $0 | $0 | $0 |
| E. Monitoring and evaluation plan, STE (Logit) | $0 | $0 | $0 | $0 | $0 | $0 |
| G. Implementation planning, Local consultants | $4,000 | $0 | $0 | $0 | $0 | $4,000 |
| **1299 Sub-Total** | $134,700 | $108,500 | $0 | $2,000 | $0 | $245,200 |
| **1300 Administrative support** | | | | | | |
| **1301** Administrative staff | | | | | | |
| Secretary, Local staff | $2,880 | $2,880 | $2,880 | $2,880 | $2,880 | $14,400 |
| Support Staff, Local | $2,640 | $2,640 | $2,640 | $2,640 | $2,640 | $13,200 |
| **1302** ITDP Administrative Staff | $3,000 | $1,000 | $1,000 | $500 | $200 | $5,700 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **1399 Sub-Total** | $8,520 | $6,520 | $6,520 | $6,020 | $5,720 | $33,300 |
| | **1600 Travel on Official Business** | | | | | | |
| | **1601** Monitoring and evaluation missions | $1,000 | $4,000 | $1,000 | $0 | $500 | $6,500 |
| | **1602** Consultant and staff travel | $8,000 | $10,000 | $1,500 | $750 | $1,000 | $21,250 |
| | **1603** Accommodation and per diem | $12,600 | $5,000 | $2,400 | $1,200 | $0 | $21,200 |
| | **1699 Sub-Total** | $21,600 | $19,000 | $4,900 | $1,950 | $1,500 | $48,950 |
| | **1999 Component Total** | $309,620 | $261,820 | $101,720 | $94,270 | $60,920 | $828,350 |
| **20** | ***Sub-Contract Component*** | | | | | | |
| | **2100 Sub-contracts with cooperating agencies (UN Agency)** | | | | | | |
| | **2101** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2102** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2199 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2200 Sub-contracts with supporting organisations (NGOs, Governments)** | | | | | | |
| | **2201** Por el País que Queremos (For the Country that we Want) | | | | | | |
| | A. Organizing stakeholders forum and dialogue | $3,000 | $0 | $0 | $0 | $0 | $3,000 |
| | B. Pedestrian and bicycle integration with BRT system | $8,000 | $10,000 | $0 | $0 | $0 | $18,000 |
| | C. Promotion | $5,000 | $5,000 | $2,000 | $0 | $0 | $12,000 |
| | D. Revision and evaluation | $0 | $5,000 | $5,000 | $0 | $0 | $10,000 |
| | **2299 Sub-Total** | $16,000 | $20,000 | $7,000 | $0 | $0 | $43,000 |
| | **2300 Sub-contracts with commercial organisations** | | | | | | |
| | **2301** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2302** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2399 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **2999 Component Total** | $16,000 | $20,000 | $7,000 | $0 | $0 | $43,000 |
| **30** | ***Training Component*** | | | | | | |
| | **3200 Group Training** | | | | | | |
| | **3201** BRT planning training | $15,000 | $15,000 | $15,000 | $15,000 | $15,000 | $75,000 |
| | **3202** NMT Training (national and international experts) | $3,600 | $900 | $0 | $0 | $0 | $4,500 |
| | **3203** Public participation training | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $25,000 |
| | **3299 Sub-Total** | $23,600 | $20,900 | $20,000 | $20,000 | $20,000 | $104,500 |
| | **3300 Meetings/Conferences** | | | | | | |
| | **3301** Conference | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $25,000 |
| | **3302** Public meetings | $0 | $0 | $0 | $0 | $0 | $0 |
| | **3303** Steering committee meetings/Bus association meetings | $0 | $0 | $0 | $0 | $0 | $0 |
| | **3304** BRT plan review seminar | $0 | $0 | $0 | $0 | $0 | $0 |
| | **3399 Sub-Total** | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $25,000 |
| | **3999 Component Total** | $28,600 | $25,900 | $25,000 | $25,000 | $25,000 | $129,500 |
| **40** | ***Equipment and Premises Component*** | | | | | | |
| | **4100 Expendable Equipment** | | | | | | |
| | **4101** Office Supplies | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $15,000 |
| | **4102** Software | $16,000 | $1,000 | $0 | $0 | $0 | $17,000 |
| | **4199 Sub-Total** | $19,000 | $4,000 | $3,000 | $3,000 | $3,000 | $32,000 |
| | **4200** | | | | | | |
| | **4201** Computer hardware | $4,230 | $2,500 | $0 | $0 | $0 | $6,730 |
| | **4202** Office equipment | $3,000 | $1,000 | $1,000 | $1,000 | $1,000 | $7,000 |
| | **4299 Sub-Total** | $7,230 | $3,500 | $1,000 | $1,000 | $1,000 | $13,730 |
| | **4300** | | | | | | |
| | **4301** Office rental | $0 | $0 | $0 | $0 | $0 | $0 |
| | **4399 Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| | **4999 Component Total** | $26,230 | $7,500 | $4,000 | $4,000 | $4,000 | $45,730 |
| **50** | ***Miscellaneous Component*** | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **5100** | **Reporting Costs** | | | | | | |
| **5101** | Copying/distribution of BRT plan (English) | $5,000 | $0 | $0 | $0 | $0 | $5,000 |
| **5102** | Translation/copying/distribution (German) | $3,000 | $3,000 | $0 | $0 | $0 | $6,000 |
| **5199** | **Sub-Total** | $8,000 | $3,000 | $0 | $0 | $0 | $11,000 |
| **5200** | **Sundry** | | | | | | |
| **5201** | Communications ITDP: Fax/tel/email | $1,000 | $1,000 | $500 | $0 | $0 | $2,500 |
| **5202** | Communications: Project web site | $1,000 | $1,000 | $500 | $500 | $500 | $3,500 |
| **5299** | **Sub-Total** | $2,000 | $2,000 | $1,000 | $500 | $500 | $6,000 |
| **5300** | **Hospitality & Entertainment** | | | | | | |
| **5301** | | $0 | $0 | $0 | $0 | $0 | $0 |
| **5399** | **Sub-Total** | $0 | $0 | $0 | $0 | $0 | $0 |
| **5999** | **Component Total** | $10,000 | $5,000 | $1,000 | $500 | $500 | $17,000 |
| ***Grand Total*** | | **$390,450** | **$320,220** | **$138,720** | **$123,770** | **$92,420** | **$1,065,580** |

## 4.3. BRT Planning Guide budget (USD)

(See following page)

| BRT Planning Guide<br>Revenue Sources: GEF / Hewlett Foundation / GTZ | Budget summary | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **10** ***Project Personnel Component*** | **Hewlett Foundation** | | | **GTZ** | | | **GEF Contribution** | | **Total** |
| **1100 Project Personnel** | **Day Rate (in US$)** | **Days** | **Total (in US$)** | **Day Rate (in US$)** | **Days** | **Total (in US$)** | **Day Rate (in US$)** | **Days** | **Total (in US$)** |
| **1101** Walter Hook | | | | | | | | | |
| General Editing | $400 | 10 | $4,000 | | | | | | |
| Why Cities Need BRT | $400 | 3 | $1,200 | | | | | | |
| Why More cities Don't Have BRT | $400 | 2 | $800 | | | | | | |
| Initiating a BRT Project | $400 | 2 | $800 | | | | | | |
| Developing a Vision for BRT | $400 | 3 | $1,200 | | | | | | |
| Background, Situation, and Stakeholder Analysis | $400 | 3 | $1,200 | | | | | | |
| Integration w/ Land Use Planning | $400 | 3 | $1,200 | | | | | | |
| Integration with other Transit Modes | $400 | 3 | $1,200 | | | | | | |
| Social Impact Analysis of the Scenario | $400 | 3 | $1,200 | | | | | | |
| Accompanying Measures - Traffic Restraint | $400 | 5 | $2,000 | | | | | | |
| **Sub-total** | | 37 | **$14,800** | | | | | | |
| **1102** Karl Fjellstrom, | | | | | | | | | |
| Managing the Contracts, Editing | $300 | 35 | $10,500 | | | | | | |
| Formatting of document | | | | $300 | $8 | $2,400 | | | |
| **Sub-total** | | 35 | **$10,500** | | | | | | |
| **1103** Oscar Diaz, | | | | | | | | | |
| Financing BRT, General Editorial Support | $300 | 30 | $9,000 | | | | | | |
| **Sub-total** | | | **$9,000** | | | | | | |
| **1199 Sub-Total** | | | $34,300 | | | $2,400 | | | $0 $36,700 |
| **1200 Independent Consultants** | | | | | | | | | |
| 1201 **Lloyd Wright,** | | | | | | | | | |
| Editing, | $400 | 10 | $4,000 | | | | | | |
| Production of Executive Summary Version, Lloyd Wright | $400 | 3 | $1,200 | | | | | | |
| Defining BRT, | $400 | 2 | $800 | | | | | | |
| Choosing a mass transit system, | $400 | 3 | $1,200 | | | | | | |
| Public education plan, | $400 | 3 | $1,200 | | | | | | |
| Marketing plan | $400 | 5 | $2,000 | | | | | | |
| Defining Success: Indicators of Success and Ranking of Systems | $400 | 5 | $2,000 | | | | | | |
| Environmental impact analysis, Lloyd Wright | $400 | 15 | $6,000 | | | | | | |
| **Sub-total** | | | **$18,400** | | | | | | |
| **1202 Michael King** | | | | | | | | | |
| Pedestrian access planning and design | $450 | 10 | $4,500 | | | | | | |
| Modal integration plan, | $450 | 7 | $3,150 | | | | | | |
| Sub-total | | 17 | **$7,650** | | | | | | |
| **1299 Sub-Total** | | | $26,050 | | | $0 | | | $0 $26,050 |
| **1300 Administrative support** | | | | | | | | | |
| **1301** Administrative staff | | | $6,708 | | | | | | |
| **1399 Sub-Total** | | | $6,708 | | | $0 | | | $0 $6,708 |
| **1600 Travel on Official Business** | | | | | | | | | |
| **1601** Outreach visits to developing-nation municipalities | | | $0 | | | | | | |
| **1699 Sub-Total** | | | $0 | | | $0 | | | $0 $0 |
| **1999 Component Total** | | | **$67,058** | | | $2,400 | | | $0 $69,458 |
| **20** ***Sub-Contract Component*** | | | | | | | | | |
| **2100 Sub-contracts with cooperating agencies (UN Agency)** | | | | | | | | | |
| **2101** | | | | | | | | | |
| **2102** | | | | | | | | | |
| **2199 Sub-Total** | | | $0 | | | $0 | | | $0 $0 |
| **2200 Sub-contracts with supporting organisations (NGOs, Governments)** | | | | | | | | | |
| **2201** | | | | | | | | | |
| **2202** | | | | | | | | | |
| **2299 Sub-Total** | | | $0 | | | $0 | | | $0 $0 |
| **2300 Sub-contracts with commercial organisations** | | | | | | | | | |
| **2301 Background for Management Consultants and Their Role (Vlasak/Akiris)** | | | | | | | | | |
| Setting Up the Project Team, | $500 | 5 | $2,500 | | | | | | |
| Project management structure, | $500 | 5 | $2,500 | | | | | | |
| Deciding on the Business structure for the BRT System | $500 | 6 | $3,000 | | | | | | |
| Incorporating Competition Among Bus Operators | $500 | 10 | $5,000 | | | | | | |
| Setting up a financially viable tariff structure | $500 | 10 | $5,000 | | | | | | |
| Identifying Appropriate Technology and Suppliers | $500 | 5 | $2,500 | | | | | | |
| Operational cost analysis | $500 | 5 | $2,500 | | | | | | |
| Contracting of suppliers, sub-contractors, operators, etc. | $500 | 6 | $3,000 | | | | | | |
| **Sub-total** | | 52 | **$26,000** | | | | | | |
| **2302 Background for BRT Regulatory Authority and Their role (Akiris/Vlasak)** | | | | | | | | | |
| Legal basis for BRT authorities | $500 | 3 | $1,500 | | | | | | |
| Public participation processes, | $500 | 5 | $2,500 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Involving existing transport operators | $500 | 3 | $1,500 | | | | | | | | |
| | Customer service plan, | $500 | 8 | $4,000 | | | | | | | | |
| | Institutional and regulatory structure | $500 | 6 | $3,000 | | | | | | | | |
| | Fare collection and fare verification systems, | $500 | 12 | $6,000 | | | | | | | | |
| | Equipment procurement process, | $500 | 6 | $3,000 | | | | | | | | |
| | Timeline and work plan, | $500 | 3 | $1,500 | | | | | | | | |
| | Cost analyses and budgets, | $500 | 4 | $2,000 | | | | | | | | |
| | Staffing plan, | $500 | 5 | $2,500 | | | | | | | | |
| | Contracting plan, | $500 | 10 | $5,000 | | | | | | | | |
| **Sub-total** | | | 169 | **$32,500** | | | | | | | | |
| | | | | | | | | | | | | |
| **2303** | **Background for the Planning and Design Team and Their Role** | | | | | | | | | | | |
| | Setting up the Planning Team | $500 | 5 | $2,500 | | | | | | | | |
| | Planning budget and financing, | $500 | 5 | $2,500 | | | | | | | | |
| | Baseline data collection, Ideal Case and Making due with Less | | | | | | | $500 | $11 | $5,500 | | |
| | Estimating Demand | | | | | | | $500 | $14 | $7,000 | | |
| | A. Basic Advice on Traffic Modeling | | | | | | | $400 | $10 | $4,000 | | |
| | B. Traffic Modeling for BRT - Minimum Needs and State of the Art | | | | | | | $400 | $14 | $5,600 | | |
| | C. Observed Capacity and Speed data for different system designs | | | | | | | $500 | $19 | $9,500 | | |
| | Corridor Selection | $500 | 10 | $5,000 | | | | | | | | |
| | Preliminary Decision Between "Open" and "Closed' systems | $500 | 10 | $5,000 | | | | | | | | |
| | Changing Bus Routes: Direct versus Trunk and Feeder | $500 | 10 | $5,000 | | | | | | | | |
| | Optimization of Transit Services | | | | | | | $500 | $10 | $5,000 | | |
| | Testing the Scenario using the traffic model | | | | | | | $500 | $10 | $5,000 | | |
| | Traffic impact analysis | | | | | | | $500 | $6 | $3,000 | | |
| | Preliminary Testing of Financial Feasibilty | | | | | | | $500 | $1 | $700 | | |
| **Sub-Total** | | | | **$20,000** | | | | | | **$45,300** | $65,300 | |
| | | | | | | | | | | | | |
| **2304** | **Background for the Engineering Team and their Role** | | | | | | | | | | | |
| | Basics of Road Engineering and Design for BRT | $500 | 10 | $5,000 | | | | | | | | |
| | Detailed Engineering Specifications for Different Corridors and System Types | $500 | 10 | $5,000 | | | | | | | | |
| | Station and Terminal Design | $500 | 10 | $5,000 | | | | | | | | |
| | Bus Depot Design | $500 | 5 | $2,500 | | | | | | | | |
| | Control centre, | $500 | 5 | $2,500 | | | | | | | | |
| | Calculating costs | $500 | 5 | $2,500 | | | | | | | | |
| | | | | **$22,500** | | | | | | | | |
| **2305** | **Background on System Operations: The role of the operator and the regulator** | | | | | | | | | | | |
| | Institutionalizing Informal Transit Operators | $400 | 10 | $4,000 | | | | | | | | |
| | Calculating Labor needs and costs | $500 | 10 | $5,000 | | | | | | | | |
| | Scheduling | $500 | 10 | $5,000 | | | | | | | | |
| | Labor Contracting Options | $400 | 5 | $2,000 | | | | | | | | |
| | Vehicle Procurement and Maintenance Options | $400 | 10 | $4,000 | | | | | | | | |
| **Sub-total** | | | | **$20,000** | | | | | | | | |
| | | | | | | | | | | | | |
| | **Aesthetic Issues** | | | | | | | | | | | |
| | Bus Design | $400 | 1 | $400 | | | | | | | | |
| | Bus Shelter Design | $400 | 1 | $400 | | | | | | | | |
| | Branding and Logos | $400 | 1 | $400 | | | | | | | | |
| | Landscaping | $400 | 1 | $400 | | | | | | | | |
| **Sub-total** | | | | **$1,600** | | | | | | | | |
| | | | | | | | | | | | | |
| **2399** | **Component Sub-Total** | | | $122,600 | | | $0 | | | $45,300 | $167,900 | |
| | | | | | | | | | | | | |
| **30** | **Training Component** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **3200** | **Group Training** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **3201** | Presentation materials for 5-day course, Lloyd Wright | | | | $350 | $15 | $5,250 | | | $0 | | |
| **3202** | Instructor text for 5-day course, Lloyd Wright | | | | $350 | $5 | $1,750 | | | $0 | | |
| | | | | | | | | | | | | |
| **3299** | **Sub-Total** | | | $0 | | | $7,000 | | | $0 | $7,000 | |
| | | | | | | | | | | | | |
| **3300** | **Meetings/Conferences** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **3301** | Workshop to present results | | | | | | | | | | | |
| **3302** | Outreach seminars to developing-nation municipalities | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **3399** | **Sub-Total** | | | $0 | | | $0 | | | $0 | $0 | |
| | | | | | | | | | | | | |
| **3999** | **Component Total** | | | $0 | | | $7,000 | | | $0 | $7,000 | |
| | | | | | | | | | | | | |
| **40** | ***Equipment and Premises Component*** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **4100** | **Expendable Equipment** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **4101** | Office Supplies | | | $900 | | | | | | | | |
| **4102** | Software | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **4199** | **Sub-Total** | | | $900 | | | $0 | | | $0 | $900 | |
| | | | | | | | | | | | | |
| **4200** | | | | | | | | | | | | |
| **4201** | Computer hardware | | | | | | | | | | | |
| **4202** | Office equipment | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **4299** | **Sub-Total** | | | $0 | | | $0 | | | $0 | $0 | |
| | | | | | | | | | | | | |
| **4300** | | | | | | | | | | | | |
| **4301** | Office rental | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **4399** | **Sub-Total** | | | $0 | | | $0 | | | $0 | $0 | |
| | | | | | | | | | | | | |
| **4999** | **Component Total** | | | $900 | | | $0 | | | $0 | $900 | |

| | | | | | |
|---|---|---|---|---|---|
| **50** ***Miscellaneous Component*** | | | | | |
| **5100** | **Reporting Costs** | | | | |
| **5101** | Copying/distribution (English) | $7,000 | | | |
| **5102** | Translation/copying/distribution (Spanish) | $4,000 | | | |
| **5103** | Translation/copying/distribution (French) | $4,000 | | | |
| **5104** | Translation/copying/distribution (Chinese) | $4,000 | | | |
| **5199** | **Sub-Total** | $19,000 | $0 | $0 | $19,000 |
| **5200** | **Sundry** | | | | |
| **5201** | Communications ITDP: Fax/tel/email | $3,000 | | | |
| **5202** | Communications: Web hosting of Planning Guide | $1,500 | | | |
| **5299** | **Sub-Total** | $4,500 | $0 | $0 | $4,500 |
| **5300** | **Hospitality & Entertainment** | | | | |
| **5301** | | | | | |
| **5302** | | | | | |
| **5399** | **Sub-Total** | $0 | $0 | $0 | $0 |
| **5999** | **Component Total** | $23,500 | $0 | $0 | $23,500 |
| **99** | ***Grand Total*** | **$214,058** | **$9,400** | **$45,300** | **$268,758** |

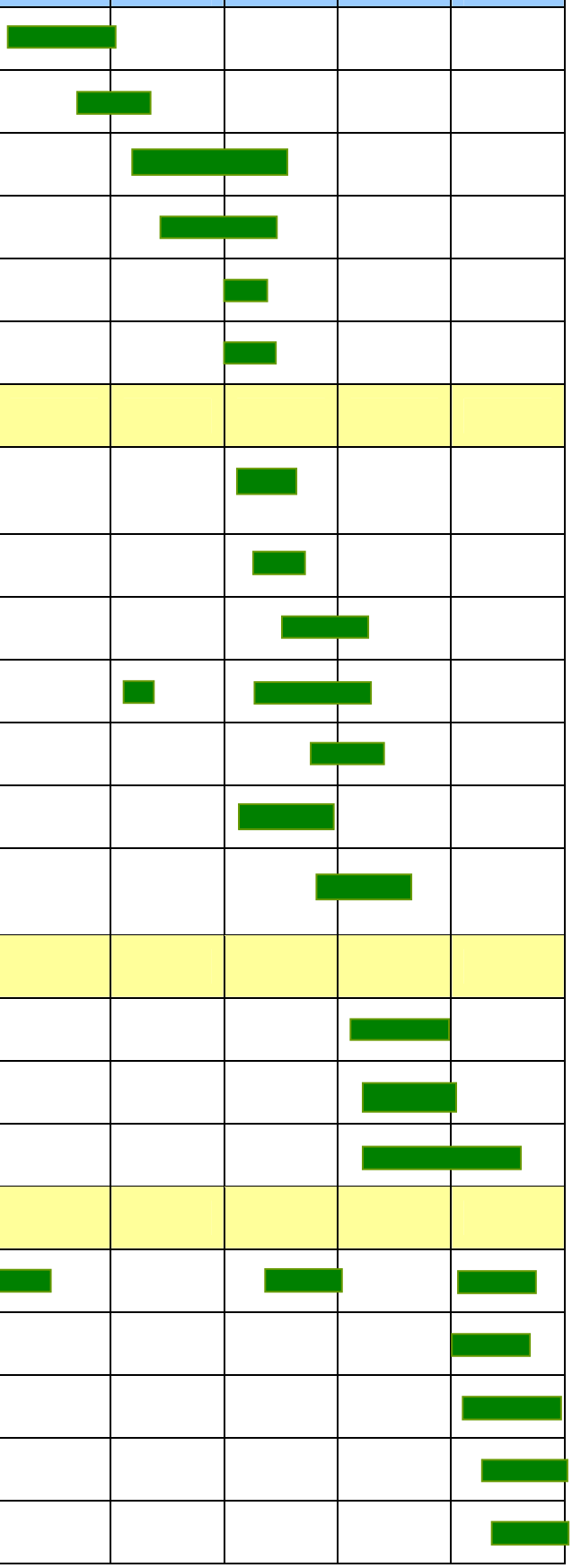
## 5. IMPLEMENTATION PLAN

The implementation plans below indicates the duration of each of the main project components and outline the expected progress of the project components in completing the various activities.

### 5.1. BRT Plan in Dar es Salaam

| Activity | Indicator / output | Pre-project | Months 1-2 | Months 3-4 | Months 5-6 | Months 7-8 | Months 9-10 | Months 11-12 |
|---|---|---|---|---|---|---|---|---|
| 1. Pre-Planning Analysis | | | | | | | | |
| 1.1 Background and situational analysis | Pre-planning analysis report | | | | | | | |
| 1.2 Stakeholder analysis | | | | | | | | |
| 1.3 Origin / destination study | | | | | | | | |
| 1.4 Overview of mass transit options | | | | | | | | |
| 2. BRT System Structure | | | | | | | | |
| 2.1 Statement of vision | As stated | | | | | | | |
| 2.2 Workplan and timeline | As stated | | | | | | | |
| 2.3 Regulatory and legal issues | BRT system structure report | | | | | | | |
| 2.4 Administrative and business structures | | | | | | | | |
| 2.5 Tariff structure | | | | | | | | |
| 2.6 Cost analysis | | | | | | | | |
| 3. Communications, Customer Service and Marketing | | | | | | | | |
| 3.1 Public participation processes | Comm., customer service and marketing report | | | | | | | |
| 3.2 Outreach with existing transport operators | | | | | | | | |
| 3.3 Public education plan | Outreach and promotional materials | | | | | | | |
| 3.4 Customer service plan | | | | | | | | |
| 3.5 Security plan | | | | | | | | |
| 3.6 Marketing plan | | | | | | | | |
| 4. Engineering and Design | | | | | | | | |

| Activity | Indicator / output | Pre-project | Months 1-2 | Months 3-4 | Months 5-6 | Months 7-8 | Months 9-10 | Months 11-12 |
|---|---|---|---|---|---|---|---|---|
| 4.1 Corridor location | Engineering and design report | | | | | | | |
| 4.2 Routing options | | | | | | | | |
| 4.3 Road engineering | | | | | | | | |
| 4.4 Station and terminal design | | | | | | | | |
| 4.5 Bus depot design | | | | | | | | |
| 4.6 Landscape design and plans | | | | | | | | |
| 5. Technology and Equipment | | | | | | | | |
| 5.1 Fare collection and fare verification systems | Fare collection system specifications and ITS report | | | | | | | |
| 5.2 Control centre plan | | | | | | | | |
| 5.3 Intelligent transport systems | | | | | | | | |
| 5.4 Bus technology | Bus design specifications | | | | | | | |
| 5.5 Aesthetics | | | | | | | | |
| 5.6 Interior design of bus | | | | | | | | |
| 5.7 Equipment procurement process | Procurement contracts | | | | | | | |
| 6. Modal Integration | | | | | | | | |
| 6.1 Modal integration plan | Plan as stated | | | | | | | |
| 6.2 Travel demand management | TDM plan | | | | | | | |
| 6.3 Integration with land-use planning | | | | | | | | |
| 7. Plans for Implementation | | | | | | | | |
| 7.1 Financing plan | Plans as stated | | | | | | | |
| 7.2 Staffing plan | | | | | | | | |
| 7.3 Contracting plan | | | | | | | | |
| 7.4 System maintenance plan | | | | | | | | |
| 7.5 Monitoring and evaluation plan | | | | | | | | |

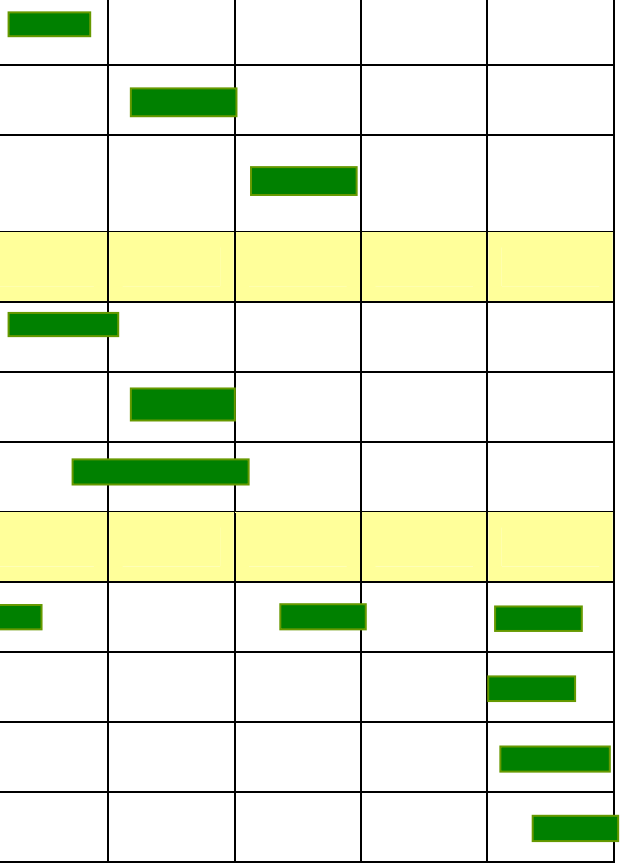


**Note: Years 2 to 5 will consist primarily of dissemination of experience and technical backstopping.**

## 5.2. BRT Plan in Cartagena

| Activity | Indicator / output | Pre-project | Months 1-2 | Months 3-4 | Months 5-6 | Months 7-8 | Months 9-10 | Months 11-12 |
|---|---|---|---|---|---|---|---|---|
| 1. Pre-Planning Analysis | | | | | | | | |
| 1.1 Background and situational analysis | Pre-planning analysis report | | | | | | | |
| 1.2 Stakeholder analysis | | | | | | | | |
| 1.3 Origin / destination study | | | | | | | | |
| 1.4 Overview of mass transit options | | | | | | | | |
| 2. BRT System Structure | | | | | | | | |
| 2.1 Statement of vision | As stated | | | | | | | |
| 2.2 Workplan and timeline | As stated | | | | | | | |
| 2.3 Regulatory and legal issues | BRT system structure report | | | | | | | |
| 2.4 Administrative and business structures | | | | | | | | |
| 2.5 Tariff structure | | | | | | | | |
| 2.6 Cost analysis | | | | | | | | |
| 3. Communications, Customer Service and Marketing | | | | | | | | |
| 3.1 Public participation processes | Comm., customer service and marketing report | | | | | | | |
| 3.2 Outreach with existing transport operators | | | | | | | | |
| 3.3 Public education plan | Outreach and promotional materials | | | | | | | |
| 3.4 Customer service plan | | | | | | | | |
| 3.5 Security plan | | | | | | | | |
| 3.6 Marketing plan | | | | | | | | |
| 5. Technology and Equipment | | | | | | | | |
| 5.1 Fare collection and fare verification systems | Fare collection system specifications and ITS report | | | | | | | |
| 5.2 Intelligent transport systems | | | | | | | | |

| Activity | Indicator / output | Pre-project | Months 1-2 | Months 3-4 | Months 5-6 | Months 7-8 | Months 9-10 | Months 11-12 |
|---|---|---|---|---|---|---|---|---|
| 5.3 Aesthetics | Bus design specifications | | | | | | | |
| 5.4 Interior design of bus | | | | | | | | |
| 5.5 Equipment procurement process | Procurement contracts | | | | | | | |
| 6. Modal Integration | | | | | | | | |
| 6.1 Modal integration plan | Plan as stated | | | | | | | |
| 6.2 Travel demand management | TDM plan | | | | | | | |
| 6.3 Integration with land-use planning | | | | | | | | |
| 7. Plans for Implementation | | | | | | | | |
| 7.1 Financing plan | Plans as stated | | | | | | | |
| 7.2 Staffing plan | | | | | | | | |
| 7.3 Contracting plan | | | | | | | | |
| 7.4 Monitoring and evaluation plan | | | | | | | | |



**Note: Years 2 to 5 will consist primarily of dissemination of experience and technical backstopping.**

## 5.3. BRT Planning Guide

| Task [and output] | Output / indicator | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Month 7 | Month 8 | Months 9-18 | Years 1.5-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Review of existing materials | Report | | | | | | | | | | |
| 2. Consultant contracts | TORs & contracts | | | | | | | | | | |
| 3. Work and editing on different components of the Guide | | | | | | | | | | | |
| 10. Draft of full report | Draft final report | | | | | | | | | | |
| 11. Peer review process | Documentation | | | | | | | | | | |
| 12. Final report | Final report | | | | | | | | | | |
| 13. Translation | Translated versions (Chinese, French, Portuguese, Spanish) | | | | | | | | | | |
| 14. Publication and dissemination | Various forms of dissemination | | | | | | | | | | |
| 15. Workshop | Report | | | | | | | | | | |

**Note: Years 1.5 to 5 will consist primarily of dissemination of experience and technical backstopping.**

# 6. PUBLIC INVOLVEMENT PLAN

Public involvement plans will vary by country and region and thus will be developed in a flexible manner. The following components will be included in the project.

Activities to raise public awareness and information dissemination of experience in the demonstration cities as well as the BRT Planning Guide have been included in the project budgets, especially in the later years, and will be carried out in collaboration with UNEP's Communication and Public Information (CPI) division. Information dissemination and awareness-raising relating to each of the project components is discussed in more detail below.

## 6.1. Stakeholders involved in the BRT Plans in Dar es Salaam and Cartagena

### 6.1.1. General observations

Typically, the greatest barrier to the actual implementation of a BRT system is the lack of communication and participation of key actors. Such communications are not only important in terms of obtaining public approval of the project but also provide the design insights of the people who will be using the system. Public inputs on likely corridors and feeder services can be invaluable. Incorporating public views on design and customer service features will also help ensure that the system will be more fully accepted and utilised.

Managing and fostering wide public involvement can be a challenge to agencies and departments unaccustomed to public processes. NGOs are sometimes better equipped to manage such processes. Consultants are another possibility. Third party management of the public participation process can also be help achieve an independent and objective viewpoint on design issues.

### 6.1.2. Social and participation issues

Change is likely be resisted by those who perceive it as threatening their current interests. BRT can improve profits and working conditions for existing operators and drivers. However, in many countries, the sector is unaccustomed to any official involvement and oversight, and operators often distrust public agencies. In cities such as Belo Horizonte, Brazil and Quito, Ecuador, proposed formalisation of the transport sector has sparked violence and civil unrest. Ideally, the existing operators can come to view BRT as a positive business opportunity and not as a threat to their future. How this key sector comes to view the concept, though, largely depends on the circumstances and manner in which BRT is introduced to them. The municipality will wish to carefully plan an outreach strategy that will build a relationship of openness and trust with the existing operators.

### 6.1.3. Stakeholder identification and participation in Dar es Salaam

As previously described, in Dar Es Salaam a Project Management Unit to implement the BRT project was formed in June 2004, with an office at the City Hall. The World Bank has an ongoing loan to the government of Tanzania for the Central Road Corridor. Included in the national government plan was the Dar es Salaam BRT project as a national priority, though the specific Bank role in this had not yet been clarified and the vast majority of the funds are for reconstruction of national highways. In March 2004 Mayor Sykes and ITDP met with the World Bank to avoid administrative confusion arising over the fact that the national government has taken an interest in the project in using the $1 million subsequently allocated to BRT project planning. This money will be used primarily for planning and detailed engineering work, but it also important to ensure that this engineering work is done under the auspices of the PMU and the Mayor's office and not under the auspices of the National Roads Agency (TANROADS) to avoid the typical problems of administrative confusion that may result in project failure. It has been agreed by all parties that the use of these funds will be determined by the PMU under the auspices of the municipality rather than the national government.

ITDP will be responsible for budget expenditure of the GEF component, and hiring and monitoring of consultant inputs. The Dar es Salaam City Council will assume the coordination role for the entire project.

Other key stakeholders will include:

- Dar es Salaam City Council
- Vice President Office (VPO)
- National Environment Management Council (NEMC)
- Collaborating Institutions (CI)

- Dar es Salaam Municipal Councils (DMC)
- Non-Governmental Organizations (NGOs)
- Private Companies (PC)
- Steering Committee (Project Guiding Team)
- Stakeholders invovled with the PCFV in Tanzania.

### Government stakeholders

Key governmental stakeholders, with brief notes on their role, include:

- The *Dar es Salaam City Council* is the owner of the project. and. The DCC will coordinate implementation of activities to be executed in the project, and will play an active technical role in planning, implementation and monitoring through its Transport Planning Department and representation on the BRT project execution team. The Council will interact with the decision makers and project execution team, consisting of various collaborating institutions, local authorities, and NGOs.
- The DCC is obliged to progressively report on the achievements of the project stages to the *Office of the Vice President*, which is the GEF Focal Point. This is a formal procedure of GEF Funded Projects.
- The DCC is obliged to work with the *National Environment Management Council* (NEMC) to see to it that it environmental regulations are adhered to.
- The three constituent *Municipal Councils* will be involved in planning and implementation of the Project.
- *Tan Roads*, a semi-autonomous agency, reports to the Ministry of Works. Tan Roads is responsible for construction and maintenance of roads in the country, including in the main proposed BRT corridors.
- The national *Ministry of Communication and Transport* is responsible for transport policy and guidelines. The ministry will assist in coordinating support towards regulatory changes with respect for example to adoption and enforcement of any required changes to standards for road designs, reforms of licensing and tendering procedures, and so on.
- The *President's Office, Regional Administration and Local Government* division oversees the DCC bugdet and provides guidance on operational issues. This ministry within the President's Office will help ensure coordination between international and local organisations as well as help ensure support from national ministries.
- *Traffic Police Unit* of the Police Force, under the Ministry of Home Affairs, is responsible for the inspection of vehicles and for enforcement of traffic laws, as well as road safety.
- The *Road Fund Board*, reporting to the Ministry of Works, currently collects fuel taxes, which are an important potential source of funding for BRT.
- The *Dar es Salaam Reginal Transport Licensing Authority*, under the Regional Commissioner, currently carries out public transport licensing, though formal authority arguably now lies with the DCC, for public transport within Dar es Salaam.
- As well as several others.

### Collaborating organisations

Collaborating organisations will comprise of key institutions (mainly local), which are responsible for, regulation, research, provision of services, etc. Such institutions shall source necessary information in various stages of project execution. Based on type of activities, business and undertakings, the collaborating organisations are expected to share expertise, experiences, necessary data and advice on technical aspects of the project. Collaborating organisations may include academic institutions, technical and research organisations, consultant companies such as the National Institute of Transport, financing organisations such as the Tanzania Investment Centre, professional accociations such as the Tanzania Institute of Engineers, as well as international organisations and civil society organisations such as ITDP and I-CE.

*Non-Governmental Organizations* will be instrumental primarily in awareness-raising campaigns and promotion of the project. The Association for the Advancement of Low Cost Mobility (AALOCOM) is a local NGO which has been a leading advocate of non-motorized transport and other low-cost solutions for Dar es Salaam. This group will play a leading role in ensuring that non-motorized options are fully integrated with the proposed Bus Rapid Transit system.

*Private companies* will ensure commercial/market values of the project are addressed. Potential private sector partners will be identified after the project is further clarified.

### 6.1.4. Stakeholder identification and participation in Cartagena, Colombia

TransCaribe, the BRT authority, has already been established and they will be the executing agency for the operational design and origin-destination survey work. The bicycle/pedestrian elements in Cartagena will be carried out under the City Planning Department.

The main state stakeholders for the project and their roles are outlined following.

#### Government

- Colombia Ministry of the Environment: Carries out the environmental administration of the country, coordinating national, regional and local levels, including in urban air quality projects. This Ministry will be involved mainly with the Greenhouse Gas Emissions Guide for BRT, but also with the BRT Planning Guide. The Ministry has been active in supporting sustainable transport initiatives in a range of cities, and will play a central role in both the development of the emissions research and the oversight of the Cartagena project. The Ministry will assist in the development of the research methodology and the selection of consultants and team members for the Colombian portion of the project. Additionally, the Ministry is a potential co-financing agency for the development of a BRT plan in Cartagena.
- Colombia National Department of Planning (DNP): This Department –Ministry level- is preparing with the support of UNDP and in coordination with the Municipality of Cartagena the Conceptual Design of the system. They also are providing funds for engineering design for construction of the first BRT corridor. DNP is the entity responsible for mounting the financing plan to implement the BRT corridor in Cartagena. This document is part of the National Transportation Policy and secures resources in the National budget to cover the national government funds for the project. This Ministry coordinates all BRT projects in Colombia according to a national policy looking into BRT feasibility and the resources available to implement the system.
- Colombia Ministry of Treasury: Makes the national budget and supervises city economic capacity to undertake the implementation and operation of the system. Construction is provided by national government on a basis of 70% of infrastructure investment. 30% must be borne by the city budget. This Ministry is responsible for the final approval of the project and for authorising the City to borrow funds. The government of Colombia and the World Bank signed the financial agreement in the first semester of 2004.
- Colombia Ministry of Transportation: Supervises the project to ensure consistency with other investments of the ministry in roads and local transportation infrastructure. The ministry is looking into how to broaden the impact of the first phase of the system. The Vice-minister himself is participating in the meetings to discuss the Conceptual Design and is very involved in promoting the system. This ministry is responsible for the inscription of the project in the National Urban Transportation Program (BPIN) and for approving the statutes of the government management company, and determining the geographical area of influence of the project. It is the main national authority in transportation.
- Municipality of Cartagena: The municipality has designated several personnel to lead the city's BRT project, and will play the central role in planning and implementing the project. The City Government is in the process of mounting a company in the same model as Transmilenio S.A., Transcaribe, to conduct the process of implementing the system and to manage the system operations.
- The City Mayor's Office: This office is leading the local preparation of the design and is responsible for maintaining the political relationship with the city council and the bus operators and civil society organisations. The City Mayor is pushing very hard to implement this project.
- City Council: Has a transportation commission that is following the development of the BRT for Bogota. Some of them have links with bus operators and discussions must be very clear to produce good results. Most of them support the implementation of the system and they authorised the Mayor to install the management organisation for the integrated transportation system of Cartagena, Transcaribe.

#### Private investors

City Bus Operators: City bus operators are still waiting for the operations plan to see how they will be involved with and affected by the BRT. This makes the operations plan very important to BRT success. The bus operators need better financing figures to make a final decision, although most of them are already interested in investing in the system.

#### United Nations and World Bank

The UNDP is financing the conceptual design and is looking for more resources so the first phase can involve more than the main corridor, and so that more measures for integration of pedestrians and cyclists can be included. The local office of UNDP will help ensure that existing UNDP-sponsored transport initiatives in Cartagena are well coordinated with the project activities.

Currently the World Bank is preparing a National Urban Transport Project, which includes Cartagena and which may include a BRT component. Exact figures of costs of the specific projects are not yet available.

Civil society organisations

- The Association of Colombian Architects has been participating in discussions of the conceptual design and is very concerned with urban image and use of water resources for transportation.
- The City Chamber of Commerce is participating in discussions but is waiting for the conceptual design before they state their formal position. Up to now, however, they have been very positive about the BRT.
- The University of Cartagena, with the support of the German government, is participating in discussions and consultations and is conducting part of the survey program. They have shown a great interest in the implementation of the BRT in Cartagena.

### 6.1.5. Information dissemination and consultation

*Participation of regional cities in the demonstration projects*

In order to enhance information dissemination, invitations will be issued to other cities to take part in and observe the implementation of BRT in Dar es Salaam and Cartagena as the project progresses. Thus, African cities such as Dakar, Accra, Lagos, etc. will be invited to participate in the Dar es Salaam project. Conversely, cities in Latin America such as San Salvador, Panama City, etc. will be invited to Cartagena during the project. Of course, they would have to use their own funds in order to participate, but based on the experience of Jakarta there will be a high level of interest in regional cities to visit projects during implementation. This will give the project more inherent outreach and will also be one of the ways in which the BRT Planning Guide will be disseminated.

*Public education plan in the implementation of BRT in the demonstration cities*

BRT will introduce a range of customer service innovations that will provide a dramatically improved transit experience for the public. To prepare the public for BRT, an educational campaign will be necessary. This plan is in part designed to secure support and approval for BRT, but also to better prepare the public so they know how the system will be used.

Thus, the public education process starts well before the system goes into operation. Information kiosks are effective means of reaching out to potential customers. Ottawa's TransitWay system maintains a permanent information outreach office located at a highly accessible shopping mall in the city centre. Public outreach workers such as in Honolulu and Bogotá are a personal and effective means of reaching consumers. In each case, the system developers do not merely assume that "if one builds it, the customers will come."

## 6.2. Stakeholder involvement in the BRT Planning Guide

### 6.2.1. Target audiences and beneficiaries

The project will link with other transit improvement initiatives that are ongoing or being planned in other countries. While many organisations are implementing or proposing demonstration projects involving the public transport sector, few information resources have been developed that facilitate best practice or capture successes to date. Without such resources, inexperienced BRT efforts may result in sub-optimum results that will diminish the reputation of BRT as a high-quality public transit option. Further, each project risks incurring significant costs in duplicating previous learning curves and planning basics. This project seeks to link all these initiatives with information that will substantially reduce such costs.

The BRT Planning Guide will be of use to the following groups:

- *Local and national officials*: As discussed in preceding sections of this proposal, cities considering mass transit options will have an interest in knowing how to plan a BRT system.
- *Global Environment Facility (GEF)*: The BRT Planning Guide will enhance the GEF's existing BRT projects as well as any future BRT projects.
- *Other international organisations*: Like the GEF, several international organisations and development agencies have an existing or potential interest in BRT as a cost-effective solution for greenhouse gas emission reductions which can at the same time address pressing local developmental objectives. Such organisations include the World Bank, International Finance Corporation, regional development banks, International Energy Agency, and overseas development agencies such as GTZ (Germany), USAID

(United States), SIDA (Sweden), CIDA (Canada), DANCED (Denmark), DFID (UK), and JICA (Japan). Many of these same organisations are also involved in various public transport reform projects, BRT projects, or in the assessment of mass transit options, and the BRT Planning Guide will be a valuable asset to them in performing these functions.

- *Private sector*: Consulting firms, especially those based in developing countries with more limited access to information, will benefit from understanding BRT planning.
- *Non-governmental organisations*: Environmental organisations and community-based organisations are vital parts of the project development process, especially in terms of ensuring environmental, social and development objectives are being achieved. The BRT planning information can be influential to the direction and focus of the interventions of these organisations.
- *Research organisations*: The BRT Planning Guide will be a valuable resource for researchers and educational institutions given the growing international interest in this field.

### 6.2.2. Global support organisations

Global support organisations include:

- ITDP – described in Section 1.13 above, will act as principal project coordinator.
- US Federal Transit Administration (USFTA) – The USFTA manages a BRT program which includes both domestic and international elements. The participation of USFTA municipal partners and supporting consultants will be sought for this project.
- The PCFV and partners, including CAI-Asia, EMBARQ, GTZ SUTP-Asia, Sustran, and DIESEL, as described in Section 1.18 preceding.

### 6.2.3. Information dissemination and consultation, and stakeholder participation

Information dissemination and consultation is a critical component of the project at several levels. At the level of project proposal formulation, a large range stakeholders have been involved, as described above. This has been achieved through meetings, workshops, seminars, technical visits, email correspondence, and other other formal and informal contacts.

Stakeholder participation in the formulation of the BRT Planning Guide will be supported at the initial draft stage through the involvement of leading institutes, organisations and experts. At the completion of consolidated drafts, the Guide will be subjected to a peer review process. The review will take place at two main levels. The initial level will involve consultation of selected international transportation experts located in various leading institutes, centres and government agencies as well as leading practititioners and consultants who are independent of the project. The second level of review will be carried out through a wider distribution to prospective users and target beneficiaries of the Guide, including through a web-based distribution of draft materials. Feedback from this range of experts and users will then be incorporated in revisions to the material, as indicated in the implementation schedules above.

The most important period of information dissemination of the Planning Guide will take place in the 2$^{nd}$, 3$^{rd}$, 4$^{th}$ and 5$^{th}$ years of the project, after the Guide has been completed. One of the main reasons for extending the project beyond a period of 2 years, up to a period of 5 years, is to ensure that the Guide (as well as the experiences in city BRT planning) are properly disseminated. Dissemination activities will be elaborated in more detail in each component of the project, but will include:

- Participation of regional cities in the demonstration projects, as explained in Section 6.2.5 below
- Presentations and distribution of informational materials at seminars and workshops
- Web-based dissemination
- Provision of DVD and VCD support materials
- Incorporation of promotion into special events (such as Car Free Days, etc)
- Promotion efforts as part of the routine work program of ITDP and other participating organisations. For examples of the promotional work currently being undertaken by ITDP please refer to www.itdp.org.

## 6.3. Institutional framework for project implementation

### 6.3.1. The role of ITDP

In both Dar es Salaam and Cartagena the local executing agency will be the Municipality, as there is nobody else in these cities that is legally empowered to implement the project. The cities are bringing their own funds to the project.

In Dar es Salaam all international contracting will be handled by ITDP from New York, and the international consultants will serve at the behest of the head of the Project Management Unit (see 6.2.3 above) and the Mayor based out of the PMU office.

As much of the matching funds are municipal money in both cases, ultimately they will control the contracting of local consultants. ITDP's ability to influence the performance of local consultants will depend upon a constructive working relationship and trust with the municipality, among other factors.

In order that ITDP has technical control over this project, the balance of the contracting, with international consultants, will be controlled out of ITDP New York. ITDP does not exist as a legal entity in either Tanzania or Colombia, and routing the funding for international consultants through the municipality would remove any ability of ITDP to control the quality of the technical work and create considerable additional bureacratic difficulties.

These respective roles are illustrated in the organizational structure below.

### 6.3.2. Overall project implementation

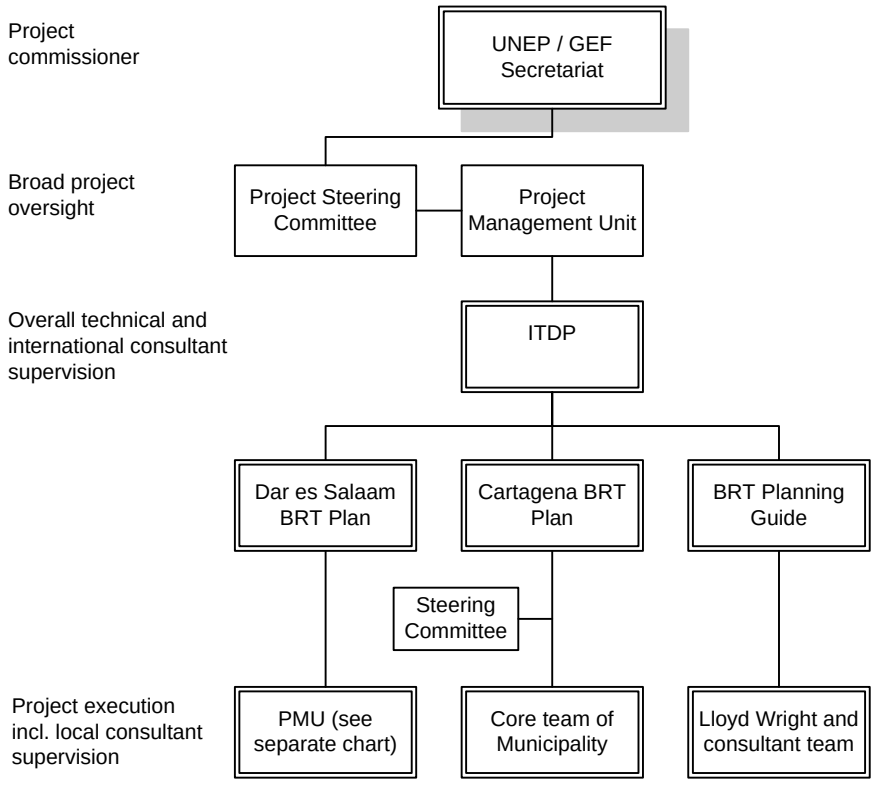
The institutional framework for project implementation, covering all components of the project, is illustrated in the chart following.

The Project Steering Committee will consist of the Executive Director of ITDP, a representative of UNEP, a representative of the GEF Secretariat, and up to eight independent experts. The Steering Committee will select its own chair.

The Project Management Unit (PMU) will be chaired by the Executive Director of ITDP, and will include in addition a representative of UNEP, a representative of the Dar es Salaam City Council, a representative of the Mayor's office in Cartegena, up to three additional staff of ITDP responsible for technical supervision of the different project components, and Lloyd Wright.

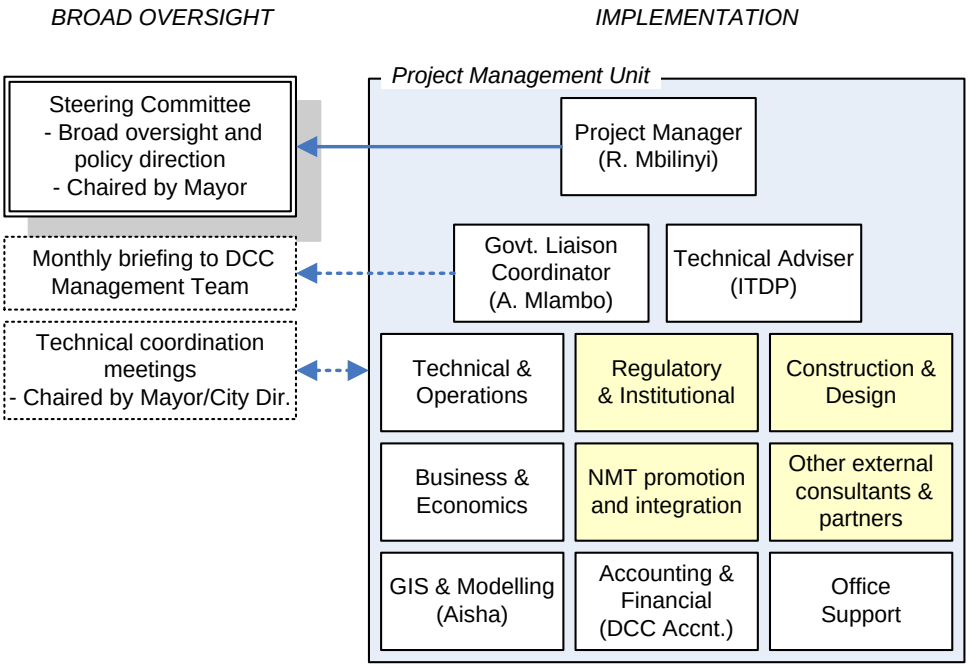
The functions of these bodies with regard to project monitoring, progress reporting and evaluation is described in Appendix 4.

**Summary institutional framework for project implementation**



### 6.3.3. BRT Plan in Dar es Salaam

The project organogram was discussed and revised based on feedback of the Mayor, the City Director, the Project Manager, and the Govt. Liaison Officer in June 2004. The latest version is provided below, with the following sections briefly discussing each component.




### 6.3.4. Steering Committee

*Membership*

The Dar es Salaam City Council will appoint the Steering Committee, which will be chaired by the Lord Mayor of Dar es Salaam City. The members of the Steering Committee are proposed to be:

- Lord Mayor, DCC (Chair)
- Dar es Salaam City Director
- Hon. Mayors of three Municipalities
- Municipal Directors (3 directors),
- Director of Surface Transport, Ministry Communication and Transport
- Director for Development, Tanroads
- Manager, Road Fund Board
- Director of Environment, Vice President's Office
- Dar es Salaam Regional Administrative Secretary
- Commissioner of Budget, Ministry of Finance
- Director of Local Government, Presidents Office, Regional Administration & Local Government
- Head of Department, Urban Planning and Environment & Utilities, DCC
- Head of Department, Planning & Coordination, DCC
- Head of Department, Finance & Administration, DCC
- City Planner, DCC
- Executive Secretary, AALOCOM

*Functions*

The role of the Steering Committee is to serve as the main decision making body of the BRT project, to serve as a consultative mechanism in project development, to provide a broad overview and policy guidance to the Project Management Unit, and to assist with addressing obstacles arise during project implementation. Each of these functions is discussed briefly following.

*Policy guidance:* The Steering Committee will be the 'political' counterpart to the 'technical' Project Management Unit. The Steering Committee will provide overall policy guidance for the technical and managerial input of the PMU.

*Decision making:* The Steering Committee should meet every month or six weeks. Although the Steering Committee is the main decision making body, it is not expected that the Steering Committee will play a role in the day to day management and implementation of the project. Such detailed decision making is the responsibility of the PMU. Rather, the Steering Committee will decide upon major issues which arise, after receiving recommendations from the Project Management Unit.

*Addressing obstacles during implementation:* A major additional role and function of the BRT project Steering Committee is to review progress and address obstacles encountered in the implementation of the project. At the Steering Committee meetings the Project Management Unit, led by the Project Manager, will report on progress in the implementation of the planning and subsequently construction, and, where delays are encountered, on the cause of any delays. The Steering Committee, as it is composed of representatives from a wide range of related government agencies, will where appropriate be requested to assist with overcoming any major obstacles reported by the PMU.

*Consultative mechanism:* The Steering Committee will in addition to the other functions also be an important arena for stakeholder consultation in the BRT project. Successful implementation of the project will require coordination and cooperation between the wide range of agencies represented on the SC.

*Launch*

The Steering Committee was successfully launched on 16 June 2004. Present at the SC launch were the Mayor, the City Director, representatives of the 3 constituent municipalities (including the Municipal Director and Deputy Mayor of Ilala), the Director of Surface Transport, Ministry Communication and Transport, the Manager of the Road Fund, the Director of Environment of the Vice President's Office, all of the heads of department of the DCC, and others.

### 6.3.5. Project Management Unit

The Project Management Unit (PMU) shall be led by the Project Manager and will be responsible for implementing the project, following the policy direction established by Steering Committee. The PMU will generally meet and work together on a daily, full time basis, although not all members of the PMU will work full time on the project for its duration.

The organisational chart above outlines particular PMU members as well as functional positions. At any particular time the PMU membership will vary according to the stage of the project, and particular positions (e.g. Technical & Operations) may be filled by one person, a team of people, or by no-one, subject to the stage of work. The functions and personnel of the PMU members are described following:

Project Manager

- Raymond Mbilinyi
- Project management

Government Liaison Coordinator

- Asteria Mlambo
- Govt. coordination
- Monthly report to the Dar es Salaam City Council

Technical Adviser

- ITDP (see separate MoU, May 2004 draft attached as Appendix 1)
- Project technical adviser

GIS & Modelling

- Aisha
- GIS & modelling

Accountant & Financial

- Dar es Salaam City Council accountant
- Accounts, budgetting and procurement

Technical & Operations

- To be hired
- Functions according to items in the detailed implementation schedule.

Business & Economics

- To be hired
- Functions according to items in the detailed implementation schedule.

Construction and design

- Hired on as-needed basis, person varies according to implementation schedule
- Functions according to items in the detailed implementation schedule.

Regulatory / legal and institutional

- Hired on as-needed basis, person varies according to implementation schedule
- Functions according to items in the detailed implementation schedule.

Non-motorised transport promotion and integration

- Hired on as-needed basis, person varies according to implementation schedule
- Functions according to items in the detailed implementation schedule.

### 6.3.6. Technical coordination meetings

It will sometimes be necessary to convene BRT project meetings involving the Mayor and/or the City Director, as well as a few other core agencies, to address any obstacles which arise during implementation and/or to decide on urgent matters which are beyond the control of the PMU. For this reason technical coordination meetings may be called by the Mayor or the Project Manager. The technical coordination meetings will not be fixed but are likely to be held weekly or twice per month. The participants in the technical coordination meetings will also not be fixed but will include:

- Mayor / City Director (Chair)
- Project Manager or Govt. Liaison Coordinator
- PMU members as relevant to the topic beind discussed
- Regional Manager, TANROADS
- City Engineer & City Planner
- DCC Public Relations Officer
- Other technical advisers as requested by the Mayor or the Project Manager.

*BRT plan in Cartagena*

A similarly composed core team and a similar configuration of external consultant input will be used in Cartagena, as elaborated in the preceding budgets and implementation schedules. The situation in Cartagena is however more complicated due to the fact that the BRT plans are more advanced, ministries of the national level of government are more closely involved, and the World Bank and UNDP have ongoing activities which are potentially related to the BRT project. It is therefore proposed that a Steering Committee will be formed for the Cartagena BRT plans consisting of the main stakeholders described in Section 6.2.4, as well as ITDP.

## 7. PROJECT MONITORING AND EVALUATION PLAN[3]

## 7.1. Outline

Project monitoring and evaluation will be conducted as part of the overall project implementation arrangement, involving Implementing Agency, Executing Agency, steering committees, supporting organisations, as well as co-financing agencies. The roles and responsibilities of these agencies in each of the different project components have been briefly outlined in Section 6 preceding, and are described in more detail in Appendix 4.

The project monitoring and evaluation will be based on the implementation plans established on the basis of the approved Medium Sized Project Brief. Particularly, the progress in achieving the global environmental objectives, and listed benchmarks (using the indicators in the MSP Brief) will be monitored and evaluated. The project monitoring will be conducted on a periodic basis, in order to assess planned substantive and financial activities are implemented according to the workplan established, and to evaluate these activities are actually giving the same level of effects and impacts as have been originally planned. Evaluation will be conducted after one year of the project duration and at the terminal point of the project implementation (that is, after 5 years), unless the project monitoring indicates needs for re-direction of project implementation. This is to objectively evaluate efficiency and cost-effectiveness of the project implementation, actual impacts of the project vis-à-vis set overall and immediate objectives and global environment targets. The evaluation also involves the issues of the sustainability of the project and its impacts, stakeholder participation, and financial management.

The Project Management Unit will take the overall responsibility for project monitoring and evaluation. Within the Implementing Agency (UNEP), the project task manager will take the overall responsibility for project monitoring and organization of external evaluation.

[3] This draft M&E plan has been prepared based on a model provided by UNEP. This draft will be presented to the first meeting of the Project Steering Committee and will be discussed and agreed upon by the SC members. The agreed M&E plan will replace the current draft.

## 7.2. Monitoring

Regular communications will be established between the PM and the UNEP on the progress of the project implementation through regular contacts, as well as required project half-yearly progress reports, to be prepared in a UNEP format.

The project will be subject to project progress review (PRR) at least once every 12 months by representatives of UNEP, and wherever necessary extraordinary progress review meetings may be organised. Other external parties may be invited to participate in the project review. UNEP may seek external expert(s) to participate in the PRR meetings. The TPR will be organised in conjunction with the project steering committee (PSC) meetings, and the reports emanating from the review meetings will be used to modify and improve the orientation and performance of the project implementation. When the project is judged to be at risk by the PRR, UNEP task manager will submit the PRR report to UNEP/GEF Divisional Review and Oversight Committee (DROC), and until a risk flag is lifted, PRR reports will be continuously submitted to DROC for its policy guidance on the overall direction of the project implementation.

The PMU shall prepare and submit to each progress review meeting an Annual Project Report (APR) in line with the Project Implementation Review conducted in the UNEP format. This will ensure that design and inception activities are closely monitored and modification to the project plan can be made in time. The following table indicates tools to be used for project implementation monitoring.

### 7.2.1. Monitoring of project impacts and outcomes

The project outcomes and impacts will be monitored based on the logframe matrix at the PRR based on the Annual Project Review. Indicators set for this purpose will be used for the performance of the project implementation.

**A summary of project monitoring tools and their use**

| Tool | Frequency | Responsible Unit to prepare | Review and acceptance by UNEP |
|---|---|---|---|
| Half-yearly progress reports prepared in a UNEP format. | March and September every year | ITDP | UNEP reviews and approves them |
| Quarterly expenditure reports prepared in a UNEP format. | March, June, August, December every year | ITDP | UNEP and UNON review and approve them |
| Annual financial report and terminal project auditing | June every year | ITDP, based on the financial reporting from sub-contractors | Annual reports and terminal audit reports will be submitted to UNEP for review. |
| Annual project review (APR) reports, reporting on indicators in the MSP Brief, in the form of PIR | March every year | ITDP | Submitted to the Progress Review Meeting |
| Reports of the Project Progress Review (PPR), highlighting the outstanding and risk issues | March every year | PPR | Agreed by PPR based on the Annual Project Review. |
| Project Implementation Review (PIR) | March every year | UNEP Task Manager | UNEP task manager prepares PIRs based on the PPR and APR, submitted to UNEP portfolio manager. |
| Overall and annual work plans, which may be modified based on the SC Meeting results. | When needed, at the Steering Committee meetings | ITDP | Steering Committee approves changes. |
| Proposal for any change in budget and its allocation. | When needed, at the Steering Committee meetings | ITDP | A proposal to be submitted to UNEP for approval; as needed UNEP consults with GEFSEC |
| Disbursement and co-financing plans | At the inception of the project | ITDP | Plans to be approved by UNEP, and disbursement of GEF funds recorded by UNON. |
| Procurement plan (non-expendable equipment) | As part of quarterly financial reporting process | ITDP | Inventory of Non-Expendable Equipment submitted to UNEP for records. |
| Audit reports and other ad-hoc reviews. | As deemed necessary by internal and external auditors | Auditors | Audit reports will be submitted to UNEP for its action. |

| | | | |
|---|---|---|---|
| Project Steering Committee (PSC) report, tracking implementation progress, and providing guidance on annual workplans | Once a year. As deemed necessary extraordinary meeting | ITDP | Minutes of SC meetings will be put on the UNEP web. |
| Reports of the TDA, legal agreement, and policy meetings/workshops | As scheduled | ITDP | Reports of these meeting and agreed documents to be put on the UNEP and other supporting organisations' web sites. |

### 7.2.2. Monitoring of project outputs

The project monitoring activities will also oversee the timing, quantity and quality of major outputs expected from the project. The outputs will be delivered in line with the established project implementation timetable.

### 7.2.3. Monitoring of stakeholder participation

A wide range of stakeholders will be engaged in the process of project component implementation, and project strategies are built upon active public participation. As per the public involvement plan section in the project document, during the implementation of the project, stakeholder participation is closely monitored by the PRR. Stakeholder dissemination and communication activities will be elaborated and implemented under each component of the project, for the project duration of 5 years. Stakeholder participation evaluation should be conducted according to these elaborated plans of each project component.

### 7.2.4. Monitoring of financing, disbursement and expenditure

A GEF fund disbursement plan will be prepared during the project appraisal phase in line with the project implementation timetable. In correspondence with this GEF disbursement plan, co-financing plan will also be established during the project appraisal phase. In order to achieve maximum efficiency of fund activities, GEF fund will be disbursed based on successful completion of activities during the preceding quarter and with proof of completed activities through co-financing.

### 7.2.5. Monitoring of partnership

Periodic review will be conducted through PPRs on the partnership arrangements for maximum efficiency of project implementation.

### 7.2.6. Monitoring of building sustainability and replicability

The PRR will also review whether institutional and financial arrangements are being made for sustaining the project impacts after the project is completed. A critical review may be needed on financial sustainability. Preparation of a replication action plan to disseminate and replicate lessons learned and demonstration results will be conducted and reviewed.

## 7.3. Evaluation

Annual mandatory self-evaluations will be performed, and results will be used to adapt project strategies. UNEP will inform GEF of the evaluations during the annual Project Implementation Review (PIR). Evaluation reports will also be made available to the public, and will be shared with other GEF projects in the region to facilitate mutual learning, and strengthen strategic planning. In the mid-way of the project implementation, an external consultant will be recruited to conduct a mid-term review of the project. Upon completion of the project, external consultant(s) will be recruited to conduct a final evaluation of the project. The final evaluation report will be published by UNEP and shared with stakeholders involved and GEF. The project may be subject to GEF Secretariat Managed Project Review (SMPR).

## 7.4. Overall schedule

Overall schedule for the Project Monitoring and Evaluation is as follows:

| Timing | M&E Activity | Responsible Unit |
|---|---|---|
| November 2004 | First Steering Committee meeting and first PPR | ITDP, UNEP |
| May 2005 | First half-yearly progress report | ITDP |
| November 2005 | Second half-yearly progress report | ITDP |
| May 2006 | Second Steering Committee meeting and second PPR | ITDP, UNEP |

| | | |
|---|---|---|
| | (PIR), combined with the mid-term review and evaluation | |
| May 2006 | Third half-yearly progress report | ITDP |
| November 2006 | Fourth half-yearly progress report | ITDP |
| November 2006 | Third Steering Committee meeting and third PPR (PIR) | ITDP, UNEP |
| May 2007 | Fifth half-yearly progress report | ITDP |
| November 2007 | Sixth half-yearly progress report | ITDP |
| [November 2007] | [Fourth Steering Committee meeting and fourth TPR (PIR)] | ITDP, UNEP |
| May 2008 | Seventh half-yearly progress report | ITDP |
| November 2008 | Eighth half-yearly progress report | ITDP |
| [November 2008] | [Fifth Steering Committee meeting and fourth TPR (PIR)] | ITDP, UNEP |
| May 2009 | Ninth half-yearly progress report | ITDP |
| July 2009 | Terminal Evaluation | UNEP |
| November 2009 | Tenth half-yearly progress report | ITDP |
| November 2009 | Terminal report | ITDP |

## 7.5. Resources that will be allocated to monitoring and evaluation

Routine monitoring and evaluation for each of the core teams will be part of the regular work of the core teams, and will not require a special allocation of resources. Similarly, the formal reporting requirements will not require a special allocation of resources, as these reports will be brief progress documents rather than major formal reports.

A more substantial resource allocation is required for the mid-term and end-of-term reviews, and for the annual Project Steering Committee meetings. Resources have been allocated to these reviews as indicated in the project budgets above.

# 8. Technical review

Any required technical review will be completed by an expert selected from the roster of the Scientific and Technical Advisory Panel (STAP) upon submission of the GEF Brief.

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