**NAMAs Proposal – NAMA Seeking Support for Preparation**

**1.0. Title of Mitigation Action**

Bus Rapid Transit (BRT) for Kampala

Sector – Transport

Purpose of NAMA – The purpose of this NAMA is toimprove the efficiency of public transport, by moving commuters from private vehicles to public transportation to address both traffic and pollution problems. The NAMA will reduce transport emissions in the Kampala metropolitan region from a business as usual baseline.

Type of NAMA – This is Project NAMA that will evolve into a programme NAMA at the national level. The financing will be a mix of domestic and international support.

**2.0. Description of NAMA**

**Rationale for NAMA**

Kampala is expected to experience rapid population growth over the next 15 years, which will be accompanied by high levels of urbanization and motorization. Kampala lacks an integrated and affordable public transport system, with most public transport trips taken by 14-seat minibuses (matatus). This NAMA will assist Uganda in planning, developing and financing a coordinated urban transportation system around design of routes, linkage between the BRT routes and other modes of transport, facilities and resources to increase ridership, operational mechanisms of efficiency such as scheduling, on time repairs, maintenance, buses, pricing, park and ride facilities.

The activities of the NAMA include building 9 routes of the BRT, non-motorised transport (NMT) routes linked to the bus routes, park and ride facilities, programming and scheduling buses along the routes, and ensuring systems for operational efficiency.

**3.0 National Implementing Agency:**

 Kampala Capital City Authority in conjunction with Ministry of Works and Transport and the Uganda national Roads Authority will be the implementing agency

**4.0 Expected time frame for the Preparation of the Mitigation Action**

12 months

**5 Support Required to Prepare the Mitigation Action**

**5.1 Financial Support**

Grant Funds required: US$ 250,000

**5.2 Capacity Building Support**

This will be US$ 30,000 and is included in the grant funds

**5.3 Costs of Implementation**

The capital costs budgeted over the 15 year period were estimated to total some US$ 1.181

Billion, comprising the following allocations:

* US$ 625 million for road improvements;
* US$ 125 million for traffic management and safety improvements; and
* US$ 431 million for new bus ways and equipment (4 bus ways).

The planning and design work set out in this NAMA is expected to cost US$5 million.

**6.0 Outcomes of NAMA**

**Sector details**

The National Transportation Policy and the National Development Plan recognize the important role of the transport sector in the social and economic development of Uganda. The Government of Uganda takes transport as one of the main priority areas envisioned as the engine for socio-economic development. In reference to the eight National Development Plan (NDP) goals, the Government is committed to the implementation of the transport policy with active private sector participation. This implies that private sector will play a major role in providing public transport through a competitive system.

A key policy strategy is the preservation of existing infrastructure assets through road maintenance. The other key strategic action is the decentralisation of support to local administrations to enable the local governments to assume full responsibility for transport in the districts and municipalities. This NAMA would be important in invoking this strategic action. In this line, Kampala Capital City Authority is collaborating with The World Bank and Uganda National Roads Authority (UNRA) to conduct a feasibility study for a Bus Rapid Transit system (BRT). The BRT is envisaged to increase ridership and improve transport access for different social groups within the city region. This BRT system is planned to integrate transport modes. The emphasis is on high-capacity buses running on 9 key routes (or lines) that are ‘fed by’ and ‘deliver to’ appropriate NMT infrastructure and other transport modes as well as facilities. The aim is to increase coverage and access to public transport using mixed modes of buses, walking or bicycling, and to also use walking or bicycling. The BRT will also be fed in by complementary transport comprised of mainly the minibuses or taxis. There is recognition of environmental and de-congestion objectives of the BRT which implies planning of the pedestrian and bicycling facilities along and or in connection to BRT lines. In BRT, Universal Design principles are the norm for the buses, the bus stops (stations) and the surrounding pedestrian infrastructure. The associated facilities can include bicycle parking as well as car parks for park and ride system to encourage more people use mass transport services.

Key findings from the World Bank Feasibility Study of the Bus Rapid Transit[[1]](#footnote-1):

Based on preliminary assumptions about the future BRT system, the International Council on Clean Transportation’s modelling of city wide pollutant emissions, fuel consumption, health impacts, and time saved suggest that a BRT system in Kampala will result in considerable overall benefits approaching $10 million per year in 2035.

Bus technology feasibility study identified multiple potential technologies for consideration in Kampala’s BRT system: diesel and diesel hybrid buses for Phase I (2013-2020); clean diesel, hybrid diesel-electric, and electric trolley buses for phase II (2020-2030)

Among the BRT technologies, analysis revealed that selection of any of the technology choices, including cleanest diesel conventional and hybrid electric buses and trolley electric buses will result in significant additional fuel consumption savings and emissions reduction at modest additional cost over a Euro III diesel baseline bus

Specific choice of advanced technology should be based on more refined inputs for planned and future BRT system (i.e. targeted capacity) in Kampala as well as future fuel availability (i.e. electricity for transportation).

**Geographic coverage -** Kampala city region covering approximately 836 sq km

**Beneficiaries**

* Urban dwellers
* Transport companies
* Park facility investors

**Proposed activities of the NAMA**

The activities of the NAMA include planning and design of 9 routes of the BRT with prioritized lanes for buses and stops. This will enable timely start, stopping and ending of the trips reducing emissions associated with traffic congestion due to combustion in such crowding on roads.

The routes will be linked and connected to the feeder modes through interchange stations designed with facilities for stopping and transiting shades. Linkage with NMT lanes and interchange stations will also be implemented. Park and ride facilities of parking buildings to incentivise use of public transport and reduction of emissions from private cars for longer trips. These will be designed around a city ring outside the central business district.

The NAMA will also include awareness raising. This is key, so various public campaigns and promotions will be coordinated through the NAMA, including public messages and campaigns. Ticket coupons, long-term charges and pass chips will be instituted together with technology and devices to enable quick and efficient transactions.

The NAMA will also include training and study tours for the managers of the BRT and companies to be contracted to run the services will also be an activity. This will focus on planning, programming and scheduling buses along the routes and ensuring systems for operational efficiency. Table 1 shows the proposed workplan for the first 3 years of the BRT NAMA.

**Table 1 Proposed Work Plan for Implementing the BRT NAMA**

|  |  |
| --- | --- |
|  | Timeline in years |
|  | 1 | 2 | 3 |
| Planning and design of 9 routes of the BRT with prioritized lanes for buses and stops |  |  |  |
| Interchange stations designed |  |  |  |
| Training and study tours for the managers of the BRT |  |  |  |
| Contracting companies to run the services |  |  |  |
| Public information and awareness campaign |  |  |  |
| Conduct annual & biennial MRV reporting and monitoring and evaluation |  |  |  |

**GHG emissions and sources in the sector**

The 2011-12 transportation survey indicated that the city region’s average passenger demand forecast in the next 20 years is 236,045 passengers per day. Using the base year 2012 per capita emissions as set out in the *2012 inventory of Kampala metropolitan region*, total emissions from increased transportation will be Mt 42,960. The emissions will come from continued and increasing amounts of use of fossil fuels of diesel, petroleum and oil for the commuter vehicles. This is also based on the 2011-2012 transportation survey and GHG inventory that both indicated dominance of non-motorized transport but forecasted an increase in use of motorized transport of commuters, including motor cycles and private cars.[[2]](#footnote-2) The BRT NAMA can target to reduce the emissions by 20 – 30% from the business as usual trajectory.

**Estimated emission reductions resulting from the activities**

Using the base year 2012 per capita emissions, total emissions from increased transportation in the Kampala metropolitan region will be Mt 42,960 over a period of 25 years. The BRT NAMA can target to reduce the emissions by 20 - 30% based on the projected passenger demand and per capita emissions. The emissions are calculated using the Global Protocol for Community-Scale emissions inventory that utilizes activity data as shown in Table 2 above and attributes emissions to in-boundary activities and out-boundary activities.[[3]](#footnote-3) The emissions are computed for CO2, N2O and CH4 but all computed as CO2e. This methodology also takes into account the scope 1, 2 and 3 of emissions and apportions emissions associated with transportation that originates from elsewhere but ending within the city boundary

**GHG emissions and sources addressed by the NAMA**

Emissions in the Kampala city region stand at *tCO2* 2,743.3 based on the 2012 baseline for the region (see Table 1). The emissions come from the different modes of commuters, motorcycles, trucks, rail and are attributed based on proportional responsibility. The BRT will reduce and or save emissions through the routes including Entebbe road, Jinja Road, Bombo Road, Gayaza Road, Kira Road, Ggaba Road, Masaka Road, Hoima Road and Port Bell road. The total passenger forecasted average demand in next 20 years is 236,045 passengers per day.

**Emission data sets / emissions information:**

The recent emissions data in Tables 2 and 3 comes from Origin Destination surveys and household surveys of 2011 adjusted to 2012.

**Table 2: Average transportation fuel use and emissions by combustion source in Kampala, 2012**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Average Use In Boundary gallons** | **Average Use Out Boundary gallons** | **Emissions Kg CO2/MMBtu Combined** | **Kt CO2** | **Kt CO2 Out boundary** | **Kt CH** |  **Kt NO** |
| **b) Mobile Combustion** |  |  |  |  |  |  |  |
| Road transportation |  104,140,130  |  353,106  |  2,229,946.30  |  2,229.9463  |  512.8877  |  0.0009  |  0.0065  |
| Railways |  |  35  |  2.02  |  0.0020  |  |  0.0000  |  0.0000  |
| International aviation\* |  96  |  |  23,658,811.3  |  23,658.8113  |  |  0.0121  |  0.0040  |
| Domestic marine\* |  781  |  |  17.5  |  0.0375  |  |  0.0175  |  2.4999  |

*Source: Lwasa, S. (2013). 2012 Greenhouse Gas Emissions Inventory for Kampala City and Metropolitan Region, UNEP Habitat.*

**Table 3: Transportation Activity Data for Kampala, 2012**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity data** |  |  |  |  |
|  | **Number/quantity** | **Total Km per year** | **Average Fuel Use per km** | **Total fuel used** |
| Bodabodas | 10000 |  13,156,000  | 0.434782609 |  5,720,000  |
| Buses | 157 |  1,378,491  |  0.7  |  898,040  |
| Private cars | 90000 |  198,198,000  | 0.649350649 |  128,700,000  |
| Others in Kampala | 89402 |  371,912,320  | 0.684931507 |  254,734,466  |
| Buses to up country | 340 |  2,068,560  | 0.651465798 |  1,347,596  |
| Taxis | 4500 |  7,534,800  | 0.985915493 |  7,428,676  |
| Ferries | 2 |  3,349  | 0.890410959 |  2,982  |
| Flights in and out estimate miles of Kampala's longest length | 24506 |  356,807,360  | 12 |  4,281,688,320  |
| Railways in boundary | 250000 | 420.8754209 | 0.545454545 |  230  |
| Railways Out boundary | 250000 | 248.015873 | 0.545454545 |  135  |

*Source: Lwasa, S. (2013). 2012 Greenhouse Gas Emissions Inventory for Kampala City and Metropolitan Region, UNEP Habitat.*

**How the NAMA is transformational**: This NAMA has potential to transform the public transportation systems in cities of Uganda through operational efficiency. Public transportation is not only costly but also inefficient in regard to time of travel and cost associated with maintenance of vehicles. Park and ride facilities would create incentives for private car users to shorten trips which would involve use of private cars and this can reduce emissions from the private modes of travel. Besides these aspects, the transformational nature of this NAMA would also relate to increased ridership and use of public transport if in operational efficiency, the costs are modest to enable urban circulation with ease of access and time of travel. Park and ride facilities would spur property development and create employment for managing the park facilities since riders would park for long hours. This can also take some cars of the city streets and reduce costs of maintenance. This NAMA is important in Uganda as urbanization increases and more towns and urban centres are growing. Implementing this NAMA will be a platform for subsequent rollout to other city regions developing in the country extending it beyond Kampala city and making it nationally relevant and important for efficient public transportation**.**

**Co-benefits of the NAMA**

The NAMA will result in significant co-benefits, categorized below using the three pillars of sustainable development: economic, social and environmental impacts. Co-benefits will be accounted for using a qualitative assessment, with a full proposal examining what statistics are readily available to measure and monitor sustainable development impacts.

***Economic***

* Employment creation – for those employed in the new BRT system. Job losses may result in other transportation modes as passengers switch to BRT, although they may be absorbed in the BRT system with additional training.
* Improvement of the local business environment.
* Improved energy security – through an efficient transport system that meets demand, but consumes as little energy as possible.

***Social***

* Improved mobility through more inclusive urban transport - if the costs are low enough to enable more people access transport services.
* Less time spent on travel.
* Increased safety and reliability of travel.
* Integrated urban activities linked to an efficient public transport.
* Improved health – reduction in number of cases of respiratory diseases.

***Environmental***

* Improved local air quality – reduced transport-related emissions (such as nitrogen dioxide, sulphur dioxide, carbon monoxide and particulate matter). It is important to measure these improvements, which reinforces the need for a monitoring system.

**Measuring, Reporting and Verification**

The MRV of this NAMA is conceptualised around the passenger demand as well as energy used by the buses. As part of the operational efficiency, passenger data collected on ridership is easy to monitor through the ticketing and automatic systems for check out. The emissions reduction is based on passenger ridership and thus the key monitoring variable is passenger ridership monitored on daily basis. The other is any switch and or shift in energy used by the buses. The company operating the BRT can be responsible for reporting to the lead agency, which will verify the data before reporting summaries on annual basis.

The data and analysis to undertake MRV will be gathered in the initial phase of the project because there is no existing baseline data. The objectives and information requirements for MRV are included in the Table 4 below.

The information requirements include:

* Data on emissions per vehicle, which can be approached from: (i) daily fuel consumption of each vehicle and its emission factor; or (ii) daily distance traveled by each vehicle and its emission factor.
* Data on daily shifted passengers and their previous transport mode.
* Data on daily BRT fuel consumption.
* Emissions factor for vehicle category and fuel type taking into account the specific conditions in Kampala, including congestion.

The reduction in GHG emissions due to the NAMA would be determined by using a CO2e emission factor for transport fuels; applying default values from Chapter 2 of Volume 2, 2006 IPCC Guidelines for Greenhouse Gas Inventories to calculate the CO2 equivalent emissions from CO2, methane and nitrous oxides. The proposed MRV framework for the BRT is given

**Table 4 Proposed MRV framework for BRT NAMA**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Indicators** | **Target** | **Type of baseline** | **Information** | **Institution Responsible for collecting Information** | **Procedure** | **Reporting** | **Verification**  | **Leadership** |
| Emission Factors Activity Data (fleet, stock, fuel) Policy and regulatory framework | Atleast 10% emission reduction, 50% reduction in private car usage  | Annual emission dataNumber of cars and number of passengers per car | Establish gazetted parks outside the city Procurement of buses comprehensive stocktaking on vehicles in city | MoWT/KCCAMoWTUBOS, URA, KCCA, Police | Setting standardsDevelopment of policy and regulatory frameworkUse of IPCC methodologyStakeholder engagement | MoWT aggregates data on a periodic basis (sometimes in response to requests) | QA/QC by GHG INV team; NEMA to do Environmental Impact Assessments/external regulatory authority (to check emissions profile of energy suppliers)  | MoWT, CCU, UBOS, KCCA, UNBS, MEMD, UBA |
|  |  |  |  |  |  |
|  |
| **Resources, capacities, staff** | Emissions: Transport engineers, statisticians; environmental officers, transport economists, emission testing gadgets NAMA: Licensing of officers, transport economist, motor vehicle inspections, enforcement officers |
| **Long-term costs** | Emissions: government and grantsNAMAs: government, grants and user contribution |

**Financing of NAMA**

Government contribution, international financing required (loan). International grant financing is required to support the preparation of a full NAMA proposal. Uganda is requesting US$ 250,000 through the submission of a NAMA seeking support for preparation through the UNFCCC NAMA registry.

**7.0 Links to National Policies and other NAMAs**

**Links to National Development Plan:** This NAMA will support national goals to: i) improve the stock and quality of economic infrastructure, and ii) encourage the sustainable use of the environment and natural resources. The NAMA also relates directly to National Transport policy and the Non-Motorized Transport Policy both of which have strategies for nationwide improvement of sustainable transportation.

**Links to Climate Change Policy:** The NAMA addresses the main goal of the National Climate Change Policy of 2013 and specifically the objective of integrating climate change in planning, decision making and investments as well as the objective to develop and implement appropriate climate change mitigation strategies. This NAMA also links with the climate change policy transport sector strategies particularly the promotion of modes of transport that take GHG emissions reduction into account, integration of risk assessment on transport infrastructure as well as building climate resilient transportation infrastructure at national level.

**8.0. Supporting Information**

**Policies**

* Uganda Rural Transport Policy, 2013, Linking people to markets and services in rural areas, Ministry of Works and Transport
* Draft National Transportation Policy,
* Non-Motorised Transport Policy, 2012 **-** The Ministry prepared a Non-Motorised Transport Policy aimed at promoting, guiding and ensuring that all the urban transport and infrastructure designs accommodate and plan for cycling and walking. The Non-Motorised Transport network in GKMA will complement the BRT system and act as feeder and distributor to the system. KCCA has already developed plans for pilot NMT corridor.

**9.0 Current Activities**

* The World Bank, Kampala Capital City Authority, Government of Uganda, 2010, Feasibility study for BRT in Kampala 2 - The Ministry signed a contract with consultants to carry out a feasibility study and detailed engineering design and contract preparation for the Pilot BRT system in Greater Kampala Metropolitan Area. This is a World Bank funded project estimated to cost approximately U$ 3.2 million. The contract duration is 12 months and was expected to be concluded by end of July 2013.

The Government is in the process of establishing a Metropolitan Area Transport Authority (MATA) to act as a single-purpose urban transport authority for better management of the public system in the GKMA including BRT. The responsibility of MATA will be planning, procurement and licensing of private transport operation.

1. ICCT. (2012). Cost benefits of clean technologies for bus rapid transit (BRT): Summary of results for Kampala, July 2012 (DRAFT version 7/25/12) [↑](#footnote-ref-1)
2. Lwasa, S. (201*3). 2012* *Greenhouse Gas Emissions Inventory for Kampala City and Metropolitan Region*, UNEP Habitat. [↑](#footnote-ref-2)
3. Arikan, Y.,Desai R., Pankaj Bhatia, P. and Wee, K. F. (2012) *Global Protocol for Community-scale Greenhouse Gas Emission (GPC). Pilot Version 1.0*. Prepared by C40 Cities Climate Leadership Group and ICLEI Local Governments for Sustainability in collaboration with: World Resources Institute, World Bank, UNEP, and UN-HABITAT. [↑](#footnote-ref-3)