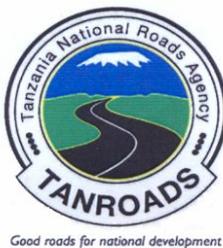


UNITED REPUBLIC OF TANZANIA
MINISTRY OF WORKS



**TANZANIA NATIONAL ROADS AGENCY
(TANROADS)**

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR IMPROVEMENT OF UBUNGO INTERSECTION

FINAL REPORT

Submitted to:

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EXECUTIVE SUMMARY

- Project:** Improvement of Ubungo Intersection
- Proponent:** The United Republic of Tanzania, Ministry of Works, through Tanzania National Roads Agency (TANROADS)
- Proponent's Contact:** TANROADS, P. O. BOX11364,
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INTRODUCTION

Dar es Salaam where the proposed project is located is the largest City in Tanzania. Dar es Salaam is actually an administrative region within Tanzania, and consists of three local government areas or administrative districts: Kinondoni to the North, Ilala in the centre of the region, and Temeke to the South. The City is estimated to have a population of 4,364,541 as per 2012 census. Located on a harbour on the Indian Ocean, it is the main port for Tanzania, handling exports of minerals and crops. In addition it is the hub of Tanzanian's national transport system as major highways and all railways originate in or near the city.

Due to the major development and population growth in the City, currently, the traffic congestion has become one of major issue for citizen. Nowadays it is approximated that more than 120,000 private vehicles move on the city's roads daily, and the traffic jams are becoming even more acute as they can also be noticed during weekends. The Centre for Economic Prosperity (CEP) recent study indicates that a motor vehicle often spends up to two hours to cover a 16- kilometer trip, a distance which could have spent only 15 minutes, if there was no traffic congestion.

During the colourful ceremony for foundation stone laying for the Phase 1 of the construction of Dar es Salaam Bus Rapid Transit (BRT) infrastructure, his Excellency Dr. Jakaya Mrisho Kikwete, the President of the United Republic of Tanzania was briefed about the current design at the Ubungo junction that; the design provides for at grade traffic crossing which is controlled by traffic lights. In order to give priority to BRT buses, the right turn is not allowed at the junction, instead the right turning vehicles have to turn first to the left and then make a "U" turn to the junction. This arrangement was noted to inconvenience significantly the mixed traffic movement and will create traffic congestion at the junction.

Following the briefing; the President supported the idea of constructing Grade Interchange at the junction and directed that, the World Bank should be requested immediately for financial support. In order to avoid disruption of the BRT operation in future, it is important for the construction of the Grade Separated Intersection to be done concurrently with the ongoing construction of the road.

In fulfilment of the above mentioned President's directive to improve the current design of the Ubungo Intersection. the Government has undertaken economic evaluation study, preliminary design, detailed engineering design and preparation of tender document for a grade separated intersection at Ubungo.

TANROADS engaged has Hamza Associates of Egypt in association with Advanced Engineering Solutions LTD of Tanzania to carry out the Economic Evaluation, Preliminary Design, Detailed Engineering Design and Preparation of Tender Documents of the Ubungo Intersection.

In order to implement the proposed project in a sustainable manner, TANROADS has also engaged an individual Consultant to undertake Environmental and Social Impact Assessment (ESIA) for the project. The Environmental Impact Assessment has been conducted in accordance with the requirements of the Environmental Management Act No. 20 of 2004 and Environmental Impact Assessment and Audit Regulations (2005) and applicable World Bank Safeguard policies. Other important legal provisions, which provide guidance on environmental issues pertaining to road sector have been consulted such as the Road Act (2007), Environmental Code of Practice for Road Works (2008), and Environmental Assessment and Management Guidelines in the Road Sector (2004).

PROJECT ENVIRONMENT

The characteristics of project environment of the project area are almost the same as those of the whole Kinondoni Municipality or Dar es Salaam City which are as follows:

- a) **Boundaries:** The City is bounded by the Indian Ocean on the east and by the Coast Region on the other sides
- b) **Surface area:** The total surface area of Dar es Salaam City is 1,800 square kilometers, comprising of 1,393 square kilometers of land mass with eight offshore islands, which is about 0.19% of the entire Tanzania Mainland's area. Temeke Municipality has the largest land surface area followed by Kinondoni while Ilala has the smallest area.
- c) **Air:** The air in the project area is considered to be very clear with low levels of pollutants. This observation is based on low record of pollution related infections in the medical centres as no detailed measurements were undertaken. The main source of pollution is generally dust generated by traffics.

d) Topography: The target road is situated on coastal hills at an altitude of around 10m and its topography is composed of plateaus with altitudes from 40m high to 200m high and flatlands in the seashore area. The City is divided into three ecological zones, namely the upland zone comprising the hilly areas to the west and north of the Dar es Salaam City, the middle plateau, and the low lands including Msimbazi valley, Jangwani, Mtoni, Africana and Ununio areas. Surface soil is composed of sand, gravel, mud and clay of the alluvial epoch.

e) Climate: The proposed project area experiences a modified type of equatorial climate. It is generally hot and humid throughout the year with an average temperature of 290C. The hottest season is from October to March while it is relatively cool between May and August with temperature around 250C. There are two rain seasons: - short rain from October to December and long rain season between March and May. The average annual rainfall is 1300mm. Humidity is around 96% in the mornings and 67% in the afternoons. The climate is also influenced by the Southwest monsoon winds from April to October and Northeast monsoon winds between November and March.

f) Geology/ Soils: The project area is covered by Neogene Semi-Consolidated Clay – bound sands possibly unconformable upon the Pugu Sandstones. Both geomorphology and geological map show that there is a normal block faulting which is trending North - South cross through Ubungo starting from Kawe (Mbezi) passing along University of Dar es salaam, Ubungo, Kinyerezi to Ukonga Prison.

The project area has two different soil types; the top soil layer of about 30cm thick consists of manmade soil (filled materials), well compacted and levelled. The second layer is generally dump, dark grey, firm sandy clay

g) Vegetation: Ubungo as part of the earth's surface is mainly composed of various vegetations like grass and trees. These trees are either exotic or indigenous species. Among the exotic species commonly observed at Ubungo includes ashok trees. In the existing ROW there is no vegetation cover, but area required for intersection improvement will affect vegetation cover especially trees found in TANESCO and SONGAS premises.

h) Hydrology/Water Resources: At project area ground water table was encountered at approximately a depth of 3.0m. The ground water table has to be monitored for a period of time to establish its seasonal fluctuation. The storm water was not noticed in the area because the area is well drained. However, in the project area the prominent surface water resources are two rivers which are Kibangu River and Ng'ombe River. Both the rivers are seasonal.

PROJECT STAKEHOLDERS AND INVOLVEMENT

The major relevant stakeholders were identified during scoping stage. These stakeholders have different roles and responsibility on the proposed project. However, their main roles were to contribute in ESIA process in order to reduce or eliminate the impacts. The followings were stakeholders identified:

Stakeholder Group	Members
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Authorities or decision makers	<ul style="list-style-type: none"> - Ministry of Works - TANROADS - Vice – President Office - World Bank - National Environment Management Council - Ministry of Lands and Human Settlement Development - Kinondoni Municipal Council
Interested parties	<ul style="list-style-type: none"> - NGOs - Individuals
Affected parties	<ul style="list-style-type: none"> - Local communities Kinondoni Municipality - Ministry of Water - TANESCO - TTCL - DAWASA - DAWASCO - SONGAS - BRT - TBS - TCRA - TPDC
Developer	<ul style="list-style-type: none"> - Ministry of works - TANROADS HQ, DSM - TANROADS Regional Office DSM

A wide public consultation was carried out during the fieldwork covering both environmental and social aspects. During the public consultation, meetings and interviews were carried out with stakeholders. Among others, the issues raised by stakeholders were categorised into four main groups these are: environmental issues, economical issues, health and safety issues and social issues. The following were the issues raised by stakeholders.

S/NO	Environmental issues	Responses by the Consultant
	Deterioration of Air quality due to exhaust fumes from machinery and equipment and dust from construction activities.	Contractor should consider selection of good machinery and vehicles, lubricants, regular service and lubrication to reduce fumes from construction machinery and vehicles. Contractor should conduct watering to suppress dust in the working sections including areas of cutting and filling, haul roads,
	Noise and vibrations will be generated due to increase in traffic movements and construction activities	Contractor should control noise and vibration to acceptable levels by using new equipment and to avoid unnecessary movement of trucks. Where it is necessary appropriate protective gears will be provided to the

		workers
	Soil and ground water pollution caused by improper handling of oil spills, effluents, bitumen, used oils and other chemicals.	Ensure daily environmental and safety management best practices to minimise and prevent spills of hazardous materials, soil pollution and improve waste management system.
Economic issues		
	The improvement of Ubungo Intersection will significantly improve transport services and reduce transport costs from wayside areas of Morogoro road, Sam Nujoma and Mandela roads such as (Mwenge, Magomeni, Buguruni, Kimara etc),	This is the main objective of the project
	Flyover Bridge at Ubungo will lead to expansion of commercial activities in the project area.	It will increase official business opportunities resulting more earning and improve life standards.
	Employment opportunity to local in the project area. This is expected to contribute to activation and stabilization of the economic activities of the low-income group, and consequently to the eradication of poverty.	The contractor should give the priority of employment to the people hailing from Mtaas along the project site. Those people may be employed as technical personnel, labourers and watchmen. Moreover as the women groups, tearooms and food vendors exist at the project site, it is anticipated to increasing their income..
	Loss of business: As the vendors will be removed from the project area, they will lose business and thus affect their daily earnings. Alternative site for vendors: It is not likely to get the same site for doing business as currently being at Ubungo Intersection	The authorities especially Kinondoni Municipality will assist affected people to acquire new areas for settlement and business.
	Revenue collection (TANESCO) will be reduced as a result of relocation of power pole and lines	During the shifting of poles and wires, the Contractor will try as much as possible to avoid any unnecessary delays.
Health and Safety issues		
	The health problems may increase due to exposure to polluted air, unnecessarily long periods spent on roads such as mental stress, tiredness, and headache. There will be a lot of inconveniences due to traffic congestion at the intersection as experienced from BRT project.	The Contractor will provide working gears to the workers and practise working shifts To avoid and control traffic congestion at the intersection during construction TANROADS/Contractor in collaboration with other government authorities and local community should improve feeder roads and introduce bypass for trucks before they reach Ubungo to avoid congestion at

		intersection.
	There will be a blockage of entrance and access to the working places or business centers during construction phase as observed in BRT project.	Contractor should consider alternative access to avoid interference
	Traffic speeds will increase during operation phase result into increased road accidents due to change of driving pattern around Ubungo Intersection	There will be a behaviour change programme for road users since the fly over is new for most of road users especially drivers and pedestrians
Social issues		
	Spread of HIV/AIDS and other diseases due to increase Social interaction	There will be a separate consultant to implement and manage HIV/AIDS alleviation programs. The Contractor will create awareness for construction workers and communities through seminars and awareness campaign on HIV/AIDS Prevention programs.
	The improvement of Ubungo intersection will bring social benefits to the road users like low traffic congestion especially at peak hours, this will reduce delay to public services, improve access to the public services such as market places, educational services, working places etc. and to the health services.	It is true; this is a purpose of road improvement strategy. Members of local communities will be able to get access more easily to social facilities such as schools and other amenities in commercial centres. The time served will be used for other economic activities and increase earnings of individual and community as a whole.
	At the Intersection, there is land constrains due to presence of private buildings and public utilities such as electricity, water supply, sewerage, telecommunication cables and poles, and gas pipelines. It is likely that some of utilities will suffer for space for relocation. In this regard, the cost of relocating all the utilities will be too high and affect the viability of the project.	The affected land and properties like buildings will be compensated to pave the space for relocating utilities.
	The flyover bridge will beautify the area and increase the value of the area.	It is true
	There will be a cut-off of public services like power and water supply due to construction activities.	It is advised to TANESCO that during construction is better to opt for live line works technology to avoid power cut off. Also the utilities have to provide early notice on the cut off services to their customers.
	The compensation should reflect the real value of affected property and be paid on time:	The valuation of the affected properties will be conducted according the national law and compensation will be implemented as soon as possible.
	Kinondoni Municipal Council has to be involved in all stages of the project cycle; at least two engineers should be involved and not only consult	The Engineers from the Municipality will be involved in the site meetings.

	them when there are problems.	
	The people were happy with the project and they wanted the construction of Flyover to commence as soon as possible.	The proposed project will be implemented as soon as possible.

IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

The following are the potential impacts for the proposed project.

Positive Impacts:

○ Job Creation and Increased Income to Local Communities

During construction most of casual labourers and some skilled workforce will be absorbed from the nearby project areas. Apart from the opportunities for self-employment the intersection improvement will promote income generating activities like selling food and other merchandise to the construction workforce.

○ Improved Accessibility to Markets Centres

The improved road will facilitate the transportation of the products from project area to the markets in area of consumption as well as smooth transport of people from their homes to market centres.

○ Improved Access to Services

The proposed road improvement will improve transportation and enable easier purchase and delivery of drugs/medicines to health care facilities. Patients will receive faster medical attention (especially emergency cases). Health workers will enjoy easier access to work than before. Members of local communities will be able to get access more easily to social facilities such as schools and other amenities in commercial centres

○ Reduction in Travel Duration and Distance to Services

The improvement of the intersection will facilitate easy transport and transportation within Kinondoni Municipality and other suburban areas as well as increasing communication among the communities along the Morogoro road, Sam Nujoma and Nelson Mandela roads to Dar es Salaam City Centre, hence reduced travel time and costs and increase socio-cultural interaction.

○ Promote Investment and Industrial Sector

The Ubungo Intersection connects three roads (Morogoro road, Sam Nujoma road and Mandela road). Morogoro Road gives access and exit from Dar es Salaam to up-country Cities and neighbouring countries. The Nelson Mandela Road has formed one of the logistic distribution networks to connect inland areas to Dar es Salaam Port for transporting not only

domestic goods but also goods to the landlocked countries. This project will reduce the transport cost of materials and products to the Dar es Salaam Harbor, and in industrial areas which in turn contribute to activation of the wayside commercial activities.

- Easing of Domestic and International Physical Movement of People and Goods

This project will reduce traffic congestion of three roads which form intersection (Morogoro, Sam Nujoma and Nelson Mandela roads) which in turn reduces the time for road traffic of cargoes to the Dar es Salaam Harbour, city centre, industrial areas and inland countries. In consequence, physical flow to and from inland countries will become more active.

Negative Impacts

- Land Expropriation and Loss of Structures

The use of land for improvement of the intersection may entail the voluntary sale or compulsory acquisition (expropriation) of homes, property, businesses, and other productive resources. Involuntary displacement or resettlement would cause social disruption and economic loss for the affected individuals and their families. Currently Ubungo Intersection is famous for vending businesses which are carried out within the road reserve. During the construction works, all these businesses will be affected. About 59 properties will be affected by implementation of the project.

- Interruption of Public Services

The proposed project will involve the relocation of utility facilities such as water supply, sewer pipes, telephone, electric cable and gas pipes. During the relocation of these utilities the communities will suffer from the service cut-off.

- Increased Traffic Congestion and Accidents

During construction, the increased traffic movements will result into traffic congestion and disruption specifically at road crossings. Also in this phase there will be a labor accident including falls involving pedestrians and street vendors. On the other hand, because the improvement of Ubungo intersection will be of its kind in Dar es Salaam city, traffic accidents may increase at the initial stage of construction.

- Cutting trees

There are no trees found inside the ROW. However, there are few trees found within the premises of TANESCO and SONGAS. In order to secure the required area to enable the construction works to proceed, it will be necessary to cut down these trees.

- Surface Water and Soil Pollution

Pollution of ground water and soil may occur due to accidental spillage of fuel, motor oils, and chemicals like paints. Deposition of concrete and fine sediments during construction may cause effects to the Kibangu/Ubungo river crossing Mandela road about 100 m from the intersection and Ngombe river crossing Sam Nujoma about 100m from the intersection.

- Noise and Vibrations

Increased traffic movement across the project area is likely to cause considerable noise and vibrations. The noise and vibrations will be produced by construction equipment and trucks during transport, and delivery of construction materials to the project site.

- Air Pollution

Dust generated from land clearing, extraction, transportation, offloading, stockpiling and spreading of sand and gravel will have negative impact to the air quality. Another source of air pollution will be due to exhaust fumes from operating construction machinery, equipment and vehicles. In addition, there will be clouds of dusts due to movements of vehicles and construction machinery.

- Soil Erosion

Removal of soil cover due to site clearing as well as other earth works will make soil susceptible to water and wind erosion. Also dumping of spoil materials are likely to increase soil erosion

- Occupational Health and Safety

The road construction activities will be associated with the following Occupational Health and Safety issues;

- Injuries or death due to lack or poor separation of working areas and traffic area
- High generation of dust which exposes the laborers and the general public to bronchial and other respiratory track diseases

- Transmitted Diseases

The road construction activities will be associated with the followings transmitted diseases:

- STI, and HIV/AIDS due to increase immigrants and higher earnings of the construction workers which attract women in sexual relations.
- Water borne diseases due to poor sanitation

- Surface Water Flow Modification

Construction of approach road embankments is likely to interfere with natural surface flow patterns. The additional discharge of storm water collected from the roadsides also present a particular hydrological problem, where by concentrating flow in one direction, resulting into channel modification.

- In-migration

The improvement of Ubungo Intersection will be accompanied by in-migration of job seekers while during operation opportunistic businesses and speculators for expansion of business areas will increase. The influx of the people in the project area may acerbate the vending problems in the project area.

- Increase child labour

The available opportunity for employment may attract child to seek temporary jobs, It has been evident that most development projects trigger engagement of children less than 18 years to work contrary to the national and international laws which prohibit child labour.

- Generation of liquid and solid waste

The liquid wastes that will be generated are waste water from camp sites, and used oils. Solid wastes will include cement bags, wood, plastic and metal containers such as drums, and tins, bottles etc. During construction there will be waste materials generated from soil cutting, filling and leveling of road alignment, this include uprooted trees and surplus materials.

- Reduce Water Quality due to runoff

In the operation phase, the motor vehicle emissions and contaminants carried by the tires may participate and stay on the roads. Surface run-off formed during rain will carry the contaminants to the water sources.

- Loss of Employment

During decommission phase people will lose their jobs and employment. This situation will threaten the security of their lives and create a negative thought of losing a good relation with their family members. This financial burden will lead to stress.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The environmental options to minimize or prevent the identified adverse impacts are given in this report and are contained in the Environmental and Social Management Plan (ESMP).The mitigation measures are further reflected in the bidding documents (conditions of contract, specifications, drawings and bills of quantities as appropriate) to ensure that they will be implemented by the parties to the contract.

The ESMP describes the implementation schedule of the proposed mitigation measures as well as planning for long-term monitoring activities. It defines roles and responsibility of different actors of the plan. The associated costs for implementing mitigation measures for improvement of Ubungu Intersection is tuned to Tshs 73,000,000.00 and environment monitoring costs is tuned to Tshs 11,200,000.00. The cost for compensation of affected properties is Tshs 10,560,997,472.00 and the cost for relocation of utilities is Tshs 24,185,961,263.00 excluding water supply utilities. The mitigation measures for the identified impacts are as indicated below:

Impact	Mitigation measure	Responsible Institution	Time Frame	Estimated Costs (TZS)
Land Expropriation and Loss of Structures	<ul style="list-style-type: none"> ○ Realigning the bridge structure and approach roads to minimize land take and effects to the building structures ○ PAPs' compensations before project implementation phase 	<ul style="list-style-type: none"> ○ Design Engineer ○ TANROADS 	Before construction phase –short term	Valuation Report
Interruption of public utilities	<ul style="list-style-type: none"> ○ Realigning the bridge structure and approach roads to minimize the effects to the electricity facilities ○ Relocating utilities (Electricity,) 	<ul style="list-style-type: none"> ○ Design Engineer ○ Contractor ○ TANROADS ○ TANESCO 	Before construction phase	Cost estimates from TANESCO
	<ul style="list-style-type: none"> ○ Realigning the bridge structure and approach roads to minimize the effects to the telecommunication facilities. ○ Relocating utilities (Telephone) 	<ul style="list-style-type: none"> ○ Design Engineer ○ Contractor ○ TANROADS ○ TTCL 	Before Construction phase – short term	Cost estimates from TTCL
	<ul style="list-style-type: none"> ○ Realigning the bridge structure and approach roads to minimize the effects to the water supply and sewerage facilities ○ Relocating utilities (Water Supply and Sewerage facilities) 	<ul style="list-style-type: none"> ○ Design Engineer ○ Contractor ○ TANROADS ○ DAWASA ○ DAWASCO 	Before construction phase	Cost estimates from DAWASA (Not yet done)
	<ul style="list-style-type: none"> ○ Realigning the bridge structure and approach roads to minimize the effects to Gas pipeline ○ Relocating Gas pipeline 	<ul style="list-style-type: none"> ○ Design Engineer ○ Contractor ○ TANROADS ○ SONGAS ○ TPDC 	Before construction phase	Cost estimates from TPDC
Increase Road Accidents during operation phase	<ul style="list-style-type: none"> ○ Provide road signs ○ Installation of speed humps ○ Provision of enough designated people crossing points to avoid people crossing at any road point 	<ul style="list-style-type: none"> ○ Design Engineer ○ Contractor ○ TANROADS ○ Dar es Salaam City 	Long-term (Operation phase)	5,000,000.00

Impact	Mitigation measure	Responsible Institution	Time Frame	Estimated Costs (TZS)
	<ul style="list-style-type: none"> ○ Adequate lighting 	<ul style="list-style-type: none"> ○ Council ○ Traffic Police 		
Loss of vegetation	<ul style="list-style-type: none"> ○ Confine clearance to corridor of impact ○ Tree planting after construction 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Environmental Supervisor 	Before and during construction phase	3,000,000.00
Water and soil pollution	<ul style="list-style-type: none"> ○ No refueling of plant or transfer of materials near watercourses ○ Installing spill kits at every refueling/transfer area ○ Establish and maintain proper and orderly material storage compounds and vehicle maintenance yards ○ Construct concrete pads with catch drains for spillage containment in the workshop for repair of vehicle and heavy equipments ○ Construct culverts and drainage channels at selected best discharge points 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Environmental Supervisor 	Short-term (Construction phase)	3,000,000.00
Noise, Vibration and Air Pollution	<ul style="list-style-type: none"> ○ Watering working road section (near human habitation and uninhabited sections to reduce occupational exposures and to improve traffic visibility) ○ Proper selection of construction machinery and vehicles ○ Regular services and lubrication ○ Use machinery with noise reducers ○ No working at night especially in areas with settlements ○ No quarry or borrow pit in neighbourhood of residences ○ Periodic water sprinkling on working sections. 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Environmental Supervisor ○ OSHA 	Short-term (Construction phase)	30,000,000.00
Soil erosion	<ul style="list-style-type: none"> ○ Avoid unnecessary ground clearance ○ Provide adequate drainage channels 	<ul style="list-style-type: none"> ○ Contractor ○ Design Engineer ○ TANROADS 	Short-term	2,000,000.00

Impact	Mitigation measure	Responsible Institution	Time Frame	Estimated Costs (TZS)
	<ul style="list-style-type: none"> ○ Tree planting ○ Environmental awareness 			
Road Safety Risks	<ul style="list-style-type: none"> ○ Detailed engineering design should include road signals and signs ○ Provision of adequate insurance cover to all workers ○ Provide diversions and deploy a person responsible for traffic safety to avoid interference of traffic flow ○ Special arrangement with local traffic police for security purpose ○ Adequate lighting 	<ul style="list-style-type: none"> ○ Design Engineer ○ TANROADS ○ Local Traffic Police ○ Ministry of labour ○ CRB 	Long-term during (Construction & Operation phase)	5,000,000.00
Occupational Health and Safety	<ul style="list-style-type: none"> ○ Establishing Occupational Health and Environment induction course ○ Provide working gear and camp management that is both hygienic and safe ○ Installing well-stocked First Aid Kit at every camp site and working site 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Environmental Supervisor ○ OSHA 	short-term (Construction and operation phase)	7,000,000.00
Transmitted Diseases	<ul style="list-style-type: none"> ○ Support HIV/AIDS campaigns ○ Provide working gear and camp management that is hygienic ○ Proper disposal of wastes 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Environmental Supervisor ○ Local Government ○ Ministry of Health 	short-term (Construction and operation phase)	3,000,000.00
Landscape Modification	<ul style="list-style-type: none"> ○ Stockpile topsoil ○ Design cut and fill to minimize material import and disposal of spoil material ○ Advance notice to the local government leaders for the arrangement of relocation and compensation if any 	<ul style="list-style-type: none"> ○ Contractor ○ Design Engineer ○ TANROADS ○ NEMC ○ Local community 	Construction and operation phases (long term)	5,000,000.00
Interference to local water drainage	<ul style="list-style-type: none"> ○ Provision of drainages to allow water flow in the natural streams ○ Efficient drainage system ○ Advance notice Dar es Salaam Water Supply and Sewerage Authority for piped water present in the carriage way ○ The Contractor shall seek Water Use Permit to draw 	<ul style="list-style-type: none"> ○ Contractor ○ Design Engineer ○ TANROADS ○ NEMC ○ MoW, ○ Local communities 	Long -term (during Construction & Operation phase)	2,000,000.00

Impact	Mitigation measure	Responsible Institution	Time Frame	Estimated Costs (TZS)
	<ul style="list-style-type: none"> ○ water from existing sources ○ The contractor should think of use of alternative water sources e.g., drilling boreholes 			
In-migration	<ul style="list-style-type: none"> ○ Implementation of DSM Master Plan ○ Enforce land use plan ○ Awareness creation 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Local Government (All Municipalities in DSM City), Ministry of Lands ○ NGOs 	Long –term and During construction and Operation phase	2,000,000.00
Child labour	<ul style="list-style-type: none"> ○ Recruitment and employment of casual labours before commencing of construction works ○ Employment will be given to people above 18 years and will be based on employment policy and regulations of Tanzania. 	<ul style="list-style-type: none"> ○ Contractor ○ TANROADS ○ Labour Authority 	Short-term (Construction phase)	2,000,000.00
Solid waste generation	Proper disposal of debris and other wastes resulted from construction activities and dispose in the designated municipal dumping site	<ul style="list-style-type: none"> ○ Contractor 	Short-term (Construction phase)	4,000,000.00
Total Estimated costs for mitigation measures				73,000,000.00

RESOURCE EVALUATION

The economic analysis for the proposed Improvement of Ubungo Intersection has been prepared as part of this consultancy. The analysis was performed using the Highway Design and Management Model (HDM4 version 2.4). In the analysis it was indicated that if the mitigation measures proposed will be implemented, the economic benefits will outweigh the negative environmental effects.

DEMOBILIZATION PLAN

During the demobilization, all the scarred area will be restored by planting tree or grass. After the construction the campsites may be reverted to public services.

CONCLUSION

The implementation of the Improvement of Ubungo Intersection will entail no detrimental impacts provided that the recommended mitigation measures are adequately and timely put in place. The identified adverse impacts shall be managed through the proposed mitigation measures and implementation regime laid down in this ESIA. The total cost for implementing Environmental Social Management Plan including the monitoring plan is tuned to Tshs 84,2000,000.00 where as cost for compensation of affected properties is Tshs 10,560,997,472.00 and the cost for relocation of utilities is Tshs 24,185,961,263.00 excluding water supply utilities.