

United Republic of Tanzania  
President's Office, Regional Administration and Local  
Government (PO-RALG)  
Dar es Salaam City Council (DCC)

**THE PROJECT FOR REVISION OF  
DAR ES SALAAM URBAN TRANSPORT  
MASTER PLAN  
IN  
UNITED REPUBLIC OF TANZANIA**

**FINAL REPORT**

**ANNEXES**

JULY 2018

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

EIGHT-JAPAN ENGINEERING CONSULTANTS INC.  
NIPPON KOEI CO., LTD.  
CTI ENGINEERING INTERNATIONAL CO., LTD.  
METROPOLITAN EXPRESSWAY COMPANY LTD.



THE PROJECT FOR REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN  
FINAL REPORT

**---ANNEXES---**

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## **Annex-1: Project Implementation Structure**

### **(For Chapter-1)**

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● Annex-1-1. Work Schedule

Activities	2016		2017												2018					
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
<b>Stage I : Preparation in Japan - Progress Report-1</b>																				
[1]Discussion of the Inception Report	■																			
[2]Project Implementation Structure	■																			
[3]Review Lessons Learned from the Previous MP	■	■																		
[4]Analysis of Related Documents and Current Situation	■	■																		
[5]Capacity Development Plan	■	■																		
[6]Traffic Surveys	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
[7]GIS Data	■	■																		
[8]Progress Report-1				■																
<b>Stage II : Social-economic Framework - Progress Report-2</b>																				
[9]Social-economic Framework				■	■															
[10]Transport Policy Target				■	■	■														
[11]Development Scenario and Alternatives						■	■	■												
[12]Land Use Plan								■	■	■										
[13]Traffic Demand Forecast								■	■	■										
[14]Implementation of SEA								■	■	■	■	■	■	■	■	■	■	■	■	■
[15]Training in Japan											■									
[16]Progress Report-2																				■
<b>Stage III : Project Plan - Interim Report</b>																				
[17]Project Plan										■	■	■								
[18]Economic Analysis and Evaluation													■	■	■					
[19]Index for Evaluation and Monitoring															■	■	■			
[20]Organizational Structure for Implementation																■	■	■		
[21]Interim Report																				■
<b>Stage IV : Pre-F/S study - Final Report</b>																				
[22]Pre-F/S Study																				■
[23]Draft Final Report																				■
[24]Related Data of MP																				■
[25]Seminar in Dar es Salaam																				■
[26]Seminar in Japan																				■
[27]Submission of the Final Report																				■
<b>Stakeholder Meetings</b>										★			★		★					
<b>Seminar</b>																			△	△
<b>JCC</b>				●				●					●		●					
<b>Secretariat</b>	○						○					○		○						
<b>TWG (include technical transfer)</b>	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
<b>Report</b>	▲		▲							▲					▲				▲	▲

● Annex-1-2. Experts Assignment

Expert	In Charge	Plan/Actual	2015				2017				2018				Total (Plan/Actual)	
			10	11	12	1	2	3	4	5	6	7				
Asuyuki MAKASEHO	Team Leader / Transportation Planner 1	Plan													210	700
		Actual	6	27	27	14	14	27	18	18	18	18	18	18	18	210
Shinichi FUJISAWA	Senior Transport Planner/Signal System/and Infrastructure	Plan													150	500
		Actual	14	15	15	14	14	15	15	15	15	15	15	15	15	150
Hirotaka TAKAHASHI	Traffic Survey	Plan													90	300
		Actual	14	14	14	14	14	14	14	14	14	14	14	14	14	90
Kiyohito NAKAMURA	Transport Demand Model Specialist	Plan													90	300
		Actual	9	9	9	9	9	9	9	9	9	9	9	9	9	90
Kurato ENDO	Road Planner / Road Flood Prevention Model Specialist	Plan													0	0
		Actual	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Junichiro OGAWA	Road Planner / Road Flood Prevention Model Specialist	Plan													90	300
		Actual	9	9	9	9	9	9	9	9	9	9	9	9	9	90
Wataru OHZONO	Traffic Management Specialist/ITS Specialist	Plan													60	200
		Actual	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Ryuichi UENO	Public Transport Planner/MT Specialist	Plan													150	500
		Actual	15	15	15	15	15	15	15	15	15	15	15	15	15	150
Satoshi HAMAMADA	Public Transport Operations Specialist	Plan													60	200
		Actual	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Akio OKUTSU	Railway Transport Planner / Pre-F5 Design 1	Plan													70	233
		Actual	13	13	13	13	13	13	13	13	13	13	13	13	13	70
Yoshiyuki TAJIMA	Railway Transport Planner / Pre-F5 Design 2	Plan													95	317
		Actual	27	27	27	27	27	27	27	27	27	27	27	27	27	95
Toshiyuki ADACHI	Construction Planning / Cost Estimator	Plan													30	100
		Actual	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Akbar Ahmed ABDURAHMAN	GIS Specialist	Plan													90	300
		Actual	21	21	21	21	21	21	21	21	21	21	21	21	21	90
Takao NINOMIYA	Infrastructure Investment PPP Specialist	Plan													60	200
		Actual	17	17	17	17	17	17	17	17	17	17	17	17	17	60
Erina KAN	Environmental and Social Consideration	Plan													105	350
		Actual	15	15	15	15	15	15	15	15	15	15	15	15	15	105
Hiroshi KANEKO	Transport Economist / Financial Analyst	Plan													65	217
		Actual	15	15	15	15	15	15	15	15	15	15	15	15	15	65
Yumiko TAKEDA	Capacity Development / Project Coordinator 1	Plan													105	350
		Actual	9	9	9	9	9	9	9	9	9	9	9	9	9	105
Mayumi SHOJI	PR/Project Coordinator 2	Plan													30	100
		Actual	14	14	14	14	14	14	14	14	14	14	14	14	14	30
Tomoe IEMSA	Assistant Traffic Survey	Plan													45	150
		Actual	18	18	18	18	18	18	18	18	18	18	18	18	18	45
Ryo SAITO	Traffic Survey Analysis	Plan													14	47
		Actual	14	14	14	14	14	14	14	14	14	14	14	14	14	14



● Annex-1-3. Members of JCC, Secretariat, and TWGs

Members of JCC, Secretariat, and TWGs

C/Ps	JCC	Secretariat	Technical Working Group			
			Land Use	Road	Public Transport	Traffic Management
PO-RALG	●	●	●	●	●	●
DCC	●	●	●	●	●	●
DSM-RAS	●	●	●	●	●	●
Transport, NOWTC	●	●		●	●	●
Works, MOWTC	●	●		●	●	●
MOLHSD	●	●	●			
MOHAS	●			●	●	●
MOFP	●					
PO	●					
TANROADS	●	●		●	●	●
DART	●	●			●	●
RFB	●					
SUMATRA	●	●		●	●	●
TRC	●	●	●			
TAZARA	●	●			●	●
Traffic Police	●	●				●
Municipalities	●	●	●		●	
NIT		●		●	●	●
Academic Institutions		●		●	●	●

Progress of TWGs, Secretariat and JCC (as of the end of April 2018)

Agenda	TWG				Secretariat	JCC
	TWG-1 Land Use	TWG-2 Road Transport	TWG-3 Public Transport	TWG-4 Traffic Management		
<b>1 Inception Report</b>	<b>1st Round</b>					
1) Existing situation and Issues	3-Feb 2017	27-Jan 2017	15-Feb 2017	28-Feb 2017	1-Dec 2016	20-Jan 2017
2) Review on Current MP						
3) Progress Report 1		27-Feb 2017	10-Mar 2016			
<b>2 Progress Report 2</b>	<b>2nd Round</b>					
4) Analysis of Traffic Survey-1	21-Apr 2017 Joint Meeting				16-May 2017	22-May 2017
5) Population/Economic Framework	25-Apr 2017	11-May 2017	4-May 2017	11-May 2017		
6) Policy and Strategy			11-May 2017			
7) Future Urban Structure						
8) Traffic Demand Forecast-1 (Methodology)	9-May 2017 Joint Meeting					
<b>3 Interim Report</b>	<b>3rd Round</b>					
9) Planning	26-Jul 2017	10-Oct 2017	5-Sep 2017	10-Oct 2017	14-Nov 2017	20-Nov 2017
	26-Sep 2017	1-Nov 2017	14-Sep 2017	1-Nov 2017		
10) Analysis of Traffic Survey-2	5-Sep 2017 Joint Meeting					
11) Traffic Demand Forecast-2 (Results)						
12) Draft Master Plan, Evaluation and Selection of Pre-F/S Projects	9-Nov 2017 Joint Meeting					
<b>4 Draft Final Report</b>	<b>4th Round</b>					
13) Economic Analysis	Individual meeting with related organizations; PO-RALG, DCC, MOWTC-Works, Transport, SUMATRA, TANROADS, TRC in Nov 2017 and Feb 2018				1-Feb 2018	6-Feb 2018
14) Staging Plan						
15) Pre-F/S Projects						
16) Management of M/P						

Source: JST

**JCC Contacted Members**

S/N	POSITION / ORGANISATION	
1	Permanent Secretary	PO-RALG
2	Director of Infrastructure Development, DID	PO-RALG-DDM
3	Assistant Director of Urban Infrastructure	PO-RALG- DSM
4	Permanent Secretary	Works, MOWTC
5	Director of Road Department	Works, MOWTC
6	Director of Planning Department	Works, MOWTC
7	Assistant Director of Urban Road Department	Works, MOWTC
8	Permanent Secretary	Transport, MOWTC
9	Director of Planning	Transport, MOWTC
10	Assistant Director of Planning	Transport, MOWTC
11	Regional Administrative Secretary, DSM-RS	DSM-RAS
12	City Director	DCC
13	Chief Executive	TANROADS-HQ
14	Regional Manager	TANROADS- DSM
15	Chief Executive	DART
16	Director of Rural and Town Planning	MOLHSD
17	Director of Physical Planning Division	MOHAS
18	Director of Planning Division	MOFP
19	Deputy Manager Technical Service	RFB
20	Permanent Secretary	VPO
21	Director General	SUMATRA
22	Director General	TRC (RAHCO)
23	Managing Director	TRC (TRL)
24	Regional General Manager	TAZARA
25	Zonal Traffic Officer	DSM Zone Traffic Office
26	Municipal Director	Kinondoni MC
27	Municipal Director	Ilala MC
28	Municipal Director	Temeke MC
29	Municipal Director	Kigamboni MC
30	Municipal Director	Ubungo MC
31	Transport Specialist	World Bank, Tanzania
32	Chief Representative	JICA Tanzania Office
33	Representative	JICA Tanzania Office
34	Rector	NIT
35	Vice Chancellor	ARDHI University

**Secretariat Contacted Members**

S/N	POSITION / ORGANISATION	
1	Principal Engineer	PO-RALG
2	Regional Secretariat Engineer	DSM-RAS
3	City Planner	DCC
4	Road Engineer	DCC
5	Assistant Director of Urban & Rural Road	Works, MOWTC
6	Assistant Director of Policy and Planning	Transport, MOWTC
7	Director of Rural and Town Planning	MOLHHSD
8	Ag. Director of Planning	TANROADS-HQ
9	Director of Road Transport	SUMATRA
10	Infrastructure Manager	DART
11	Technical Manager	TRC (TRL)
12	Director of Technical Services	TRC (RAHCO)
13	Regional Manager	TAZARA
14	Zonal Police Officer	Traffic Zonal Police-DSM
15	Engineer, Works Department	Ilala MC
16	Engineer, Works Department	Kinondoni MC
17	Engineer, Works Department	Temeke MC
18	Engineer, Works Department	Ubungu MC
19	Engineer, Works Department	Kigamboni MC
20	JICA-CUPID Member	NIT
21	JICA-CUPID Member	ARDHI University
22	JICA-CUPID Member	JICA CUPID Experts

**Members of TWGs: TWG-1: Land Use Contacted Members**

S/N	POSITION	ORGANIZATION
1	Principal Engineer, Urban Infrastructure Dep	PO-RALG
2	City Planner	DCC
3	Regional Secretariat Engineer	DSM- RS
4	Assistant Director Physical Master Plan	MOLHHSD
5	Senior Statistician of Transport	Transport-MOWTC
6	Assistant Director of Urban & Rural Road	Works-MOWTC
7	Director of Technical Services	TRC (RAHCO)
8	GIS Specialist, GIS-Laboratory	UDSM
9	JICA-CUPID Member	UDSM
10	Town Planner	Ilala MC

**TWG-2: Road Transport Contacted Members**

S/N	POSITION	ORGANIZATION
1	Principal Engineer, Urban Infrastructure Dep	PO-RALG
2	Road Engineer	DCC
3	Regional Secretariat Engineer	DSM-RSE
4	Senior Statistician of Transport	Transport-MOWTC
5	Assistant Director of Urban & Rural Road	Works-MOWTC
6	Zonal Police Officer	MOHAS
7	Team Leader/Road Maintenance & Management System	TANROADS – HQ
8	Acting Head of Planning Unit	TANROADS - DSM
9	Road Licensing & Monitoring Officer	SUMATRA
10	JICA-CUPID Member	NIT
11	JICA-CUPID Member	UDSM
12	MC Engineer	Temeke MC

**TWG-3: Public Transport Contacted Members**

S/N	POSITION	ORGANIZATION
1	Principal Engineer, Urban Infrastructure Dep	PO-RALG
2	Senior Statistician of Transport	Transport-MOWTC
3	Assistant Director Physical Master Plan	MOLHHSD
4	Operation Engineer	DART
5	Assistant Director of Road Transport	SUMATRA
6	Technical Services	TRC (RAHCO)
7	Regional Manager	TAZARA
8	JICA-CUPID Member	NIT
9	MC Engineer	Kigamboni MC

**TWG-4: Traffic Control Contacted Members**

S/N	POSITION	ORGANIZATION
1	Team Leader/Road Maintenance & Management System	TANROADS – HQ
2	Acting Head of Planning Unit	TANROADS - DSM
3	Operation Engineer	DART
4	JICA-CUPID Member	NIT
5	JICA-CUPID Member	ARU
6	MC Engineer	Kinondoni MC

## ● Annex-1-4. Points of Discussion in the JCC Meetings

### ● 1<sup>st</sup> JCC in January 2017

At the 1<sup>st</sup> JCC, JST presented the Inception Report, while the Tanzanian side represented the current major projects and issues by DCC, MOWTC (W), MOWTC (T), TANROADS and TRC. There were some suggestions and comments for the target area, transport mode, urban planning, and review of the previous M/P. The major points discussed are as follows:

#### **Target Area**

- The target area shall be expanded up to 50 km away from the CBD. Compared to the previous M/P, the city is growing rapidly and expanding, and more people are commuting from outside of DSM, like Kibaha, Pugu, Kisarawe and Bagamoyo.
- DSM Land Use Master Plan shall cover the area of 50 km away from the CBD.

#### **Transport Mode**

- Harmonization and integration of the various modes of transport is required.
- Transport planning shall be integrated in consideration with the social services, such as hospitals or schools.
- Marine transport shall be included.
- Non-motorized transport such as walking, cycling shall be addressed.

#### **Urban Planning, Land Use**

- The revised M/P is required to be harmonized with DSM Land Use Master Plan, which is handled by MOLHHSD.
- New Satellite City is planned in Luguruni in order to de-congest the CBD. The latest movement and plans shall be taken into consideration.

#### **Review of the Current Master Plan**

- The revised M/P is proposed to be practical, realistic, and affordable. The projects that enforce the residents to move or shift shall be avoided in respect with the compensation.
- Local communities' plans should be included into the revised M/P
- Ownership and conductor of the revised M/P should be clarified.

In the end of the discussions, the Inception Report was approved by the members.

### ● 2<sup>nd</sup> JCC in May 2017

In the 2<sup>nd</sup> JCC, JST shared the progress and outcomes from the TWG. TWG was set up for the following categories; i) land Use, ii) Road, iii) Public Transport, and iv) Traffic Management. The analysis of current situation, identified issues and the several alternative plans were proposed. In the 2<sup>nd</sup> JCC, the following comments were raised:

#### **Environmental consideration**

- Environmental consideration from the beginning of the project is required.
- Handling the environmental issues only at the last stage of the Project costs more.

### **Marine Transport**

- Water way from Bagamoyo to Kawe shall be incorporated in collaboration with NHC's plan of Kawe Satellite City.
- To deal with shallow beach, either dig or construct a jet to follow the depth is required.

### **Land Use Plan**

- In order to harmonize the revised M/P and DSM Land Use Master Plan, the consultant team of DSM Land Use M/P shall be involved and invited to JICA official meeting either TWG or Secretariat or JCC.
- NHC has launched KAWE Satellite City plan, NHC welcomes JST to join the workshop.

### **Alternative Plan – MRT Loop Line-**

- It is required to explain the overlapping route of BRT and MRT.
- SGR application shall be considered from the initial stage.

### **DUTA**

- It is necessary to go deep into analysing and understanding the function of DUTA, and distinguishing from RRB (Regional Road Board).
- In case DUTA will be established under RRB, RRB will be required to absorb functions of DUTA and responsibilities tentatively and will be trained how to enhance DUTA and how to monitor the activities.

### **Transport Policy, Urban policy**

- Identified the missing topics, that current transport and urban policies are not covered, as required.
- It may be very difficult to go through all the process of proposing the new policies. It is better to develop alternatives that can be easily done rather than proposing new policies.
- The revision for national transport policy is not yet approved by the Ministry of Transport.
- Urban Transport is a local issue. Thus, DSM is recommended to be responsible for setting up its own urban policy and approve the investment plan.

### **● 3<sup>rd</sup> JCC in November 2017**

JST proposed the draft project plan based on the analysis of the traffic survey and future demand forecast. The staging plan for commuter train, road network, and traffic management, together with the progress of SEA, cost estimation, and organizational structure was presented in the meeting. The main points discussed in the JCC-3 are as follows:

### **Land Use, Urban Structure**

- The proposed project plan shall be harmonized with the DSM Land Use Master Plan that is undertaken by MOLHSD.
- It is requested that JICA assist the capacity development of the area of land use plan.

### **Cost Estimation**

- The area to invite private investment requires to be clarified.
- Cost for the SGR plan shall be incorporated with the shown estimate.
- The financial plan is required to be shown in the details.

### **Public Transport Plan, Railway Plan**

- The selection of the proposed railway plan shall be proposed based on the analysis of future demand forecast. There is a need to extend the railway network either to Mkuranga along Kilwa Road, or to Kibaha along Morogoro Road.
- There is the need to clarify the location of the railway stations through the discussion with TANROADS and DART.
- The issue of harmonization among the ongoing projects.
- Transport connectivity shall be considered with the local buses and intercity bus.
- In order to avoid the compensations, the underground railway or metro shall be proposed rather than elevated structure.
- It is convenient to discuss with TPA in regard to water way mode of transport.

### **Traffic Management Plan**

- The demarcation shall be required for the introduction of the traffic management, since DART has plans to apply the traffic management system.

### **Road Network Plan**

- Logistic route shall be incorporated from the DSM port.

### **Organizational Structure**

- M&E system should be standardized to implement the M/P.
- Clarifying the responsibilities of the stakeholders is required.
- Private sector involvement in the technical transfer shall be incorporated into the capacity development plan.

### **SEA**

- The countermeasure for recovering from the disaster shall be mentioned from the lessons learned of Japan.

### **PPP**

- The detailed description to involve and encourage the private sector shall be required.

## **● 4<sup>th</sup> JCC in February 2018**

The final JCC meeting was held on 6<sup>th</sup> February 2018. The draft final of DSM Urban Transport Master Plan was presented in the meeting. The points discussed are as follows.

### **Clarification of Proposed Projects**

- JST is recommended to describe the details of the proposed projects; the distance of the middle ring road, the name of area accommodated, etc.
- The indicators of economic and social factors should be mentioned in the summary. It includes GDP growth rate, traffic survey tendency, transport contribution to GDP, etc.

### **Urban Structure**

- The harmonization between DSM Urban Transport Master Plan and DSM Land Use Plan is essential. It is required to reflect the contents of the proposal of Urban Transport Master Plan to DSM Land Use Plan.

- Bagamoyo EPZ shall be considered into the Urban Structure Plan.

### **Economic Evaluation**

- Financial analysis and all the details of the Project cost estimation are recommended to be summarized in another chapter.

### **Road Plan**

- The distance of the proposed middle ring road and outer ring road shall be mentioned clearly.

### **Railway Plan • Public Transport Plan**

- Proposed Tegeta line shall be extended to Bunju, since the demand from Bunju direction is increasing rapidly.
- Tegeta line is proposed to connect to SGR. The connectivity from MRT central station to DSM central station shall be considered.
- Missing link (Mwenge - Ubungu) is better included into the priority project to attract investors. Railway network will invite the private investment.

### **SEA**

- Advanced technology in Japan such as noise reduction wall of the express way shall be examined as the environmental measure.

### **Capacity Development**

- Monitoring system shall be established.
- Proposed Information sharing center shall be established from Information database.
- The real custodian and follower shall be precisely mentioned.

### **Commitment**

- Commitment from Tanzanian side is essential. It is proposed that the detailed information regarding Bagamoyo EPZ development shall be shared to JST. The business surroundings for the foreign investors is also recommended to be prepared by the Tanzanian side.



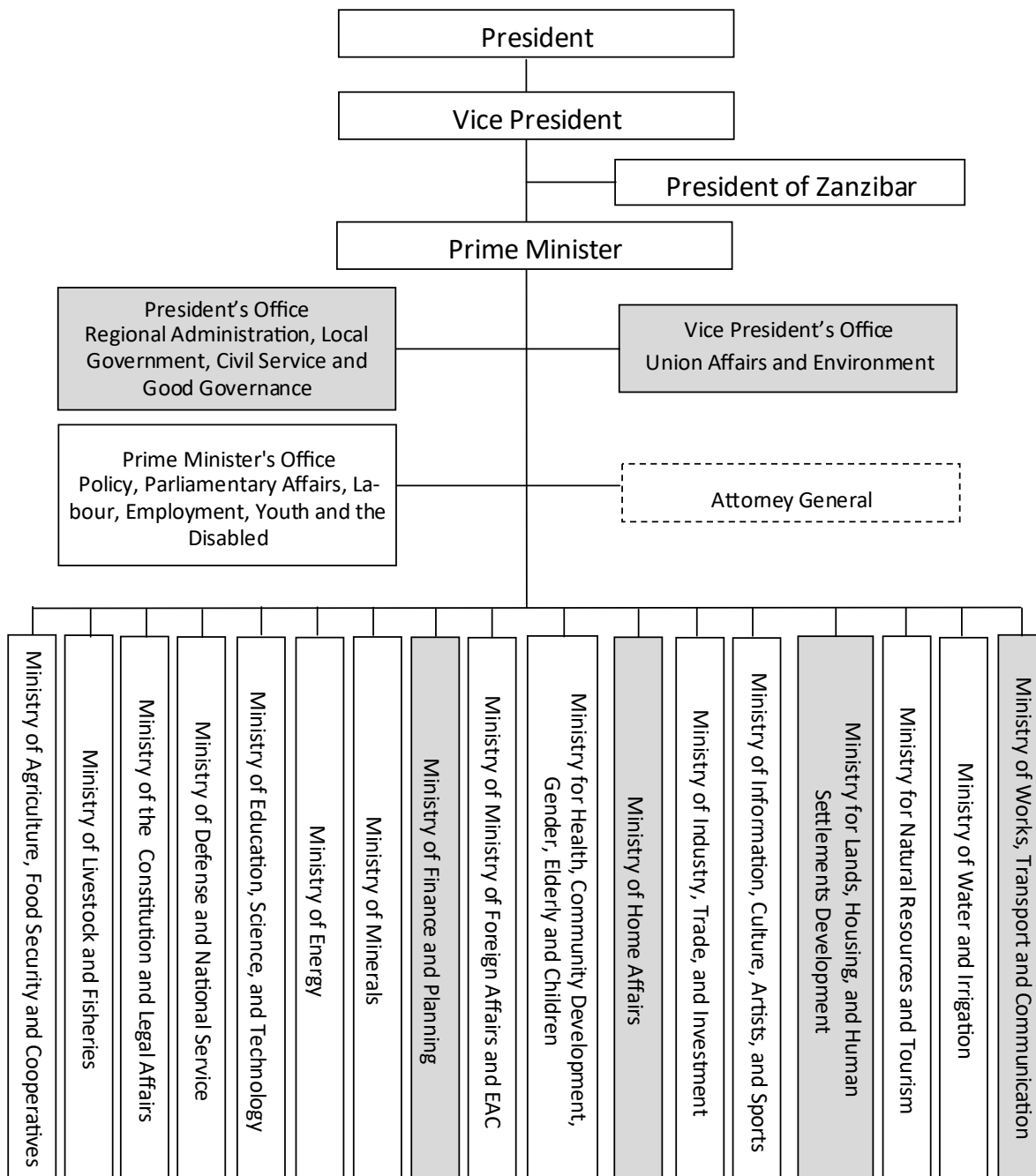
## **Annex-2: Organizational Structure of the Stakeholders (For Chapter-2)**

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- Annex 2-1: National Government and Ministries of Tanzania
- Annex 2-2: Organizational Structure of PO-RALG
- Annex 2-3: Organizational Structure of DSM Region and DCC
- Annex 2-4: Organizational Structure of MOLHSD
- Annex 2-5: Organizational Structure of Municipal Councils
- Annex 2-6: Organizational Structure of Works & Transport, MOWTC
- Annex 2-7: Organizational Structure of TANROADS HQ and Regional Office
- Annex 2-8: Organizational Structure of SUMATRA
- Annex 2-9: Organizational Structure of RFB
- Annex 2-10: Organizational Structure of DART
- Annex 2-11: Organizational Structure of VPO
- Annex 2-12: Organizational Structure of NEMC

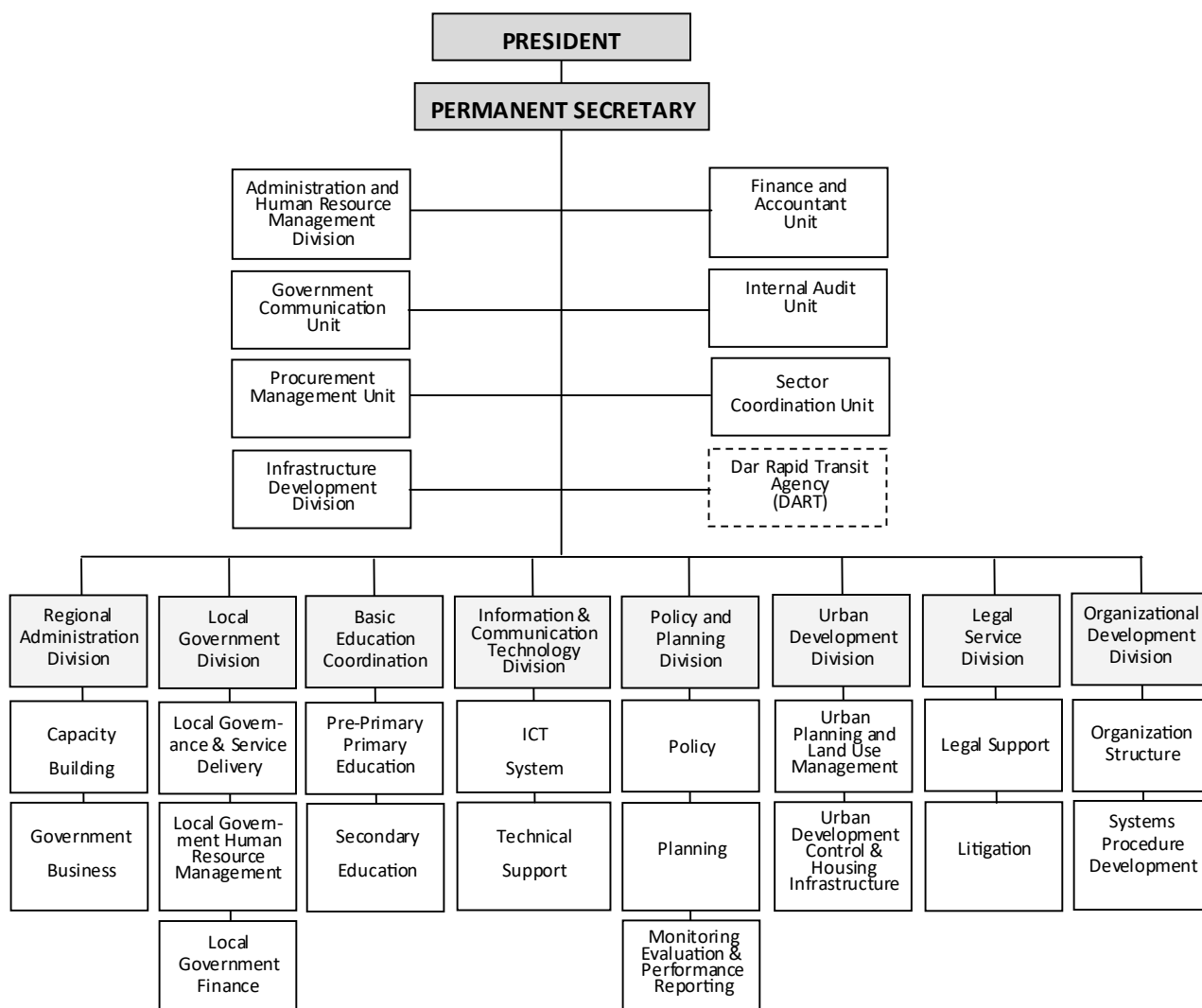


● Annex-2-1. National Government and Ministries of Tanzania



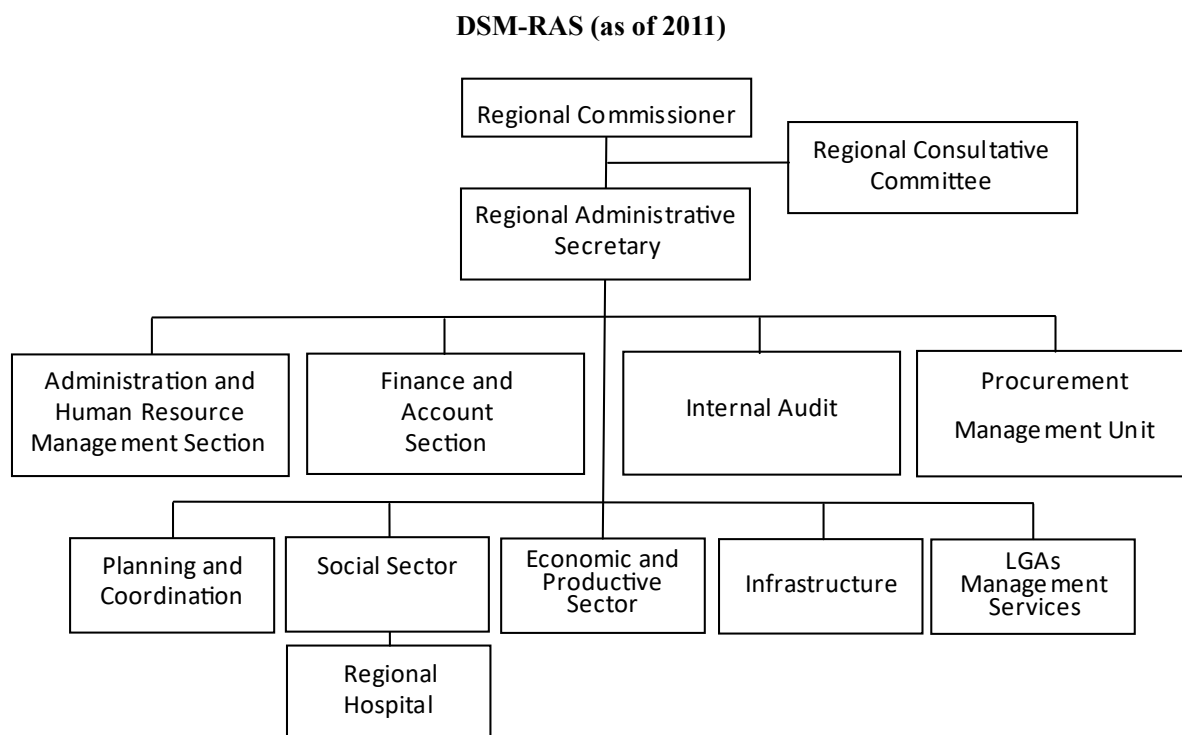
Source: WEB site Government of Tanzania, May 2018

● Annex 2-2. Organizational Structure of PO-RALG

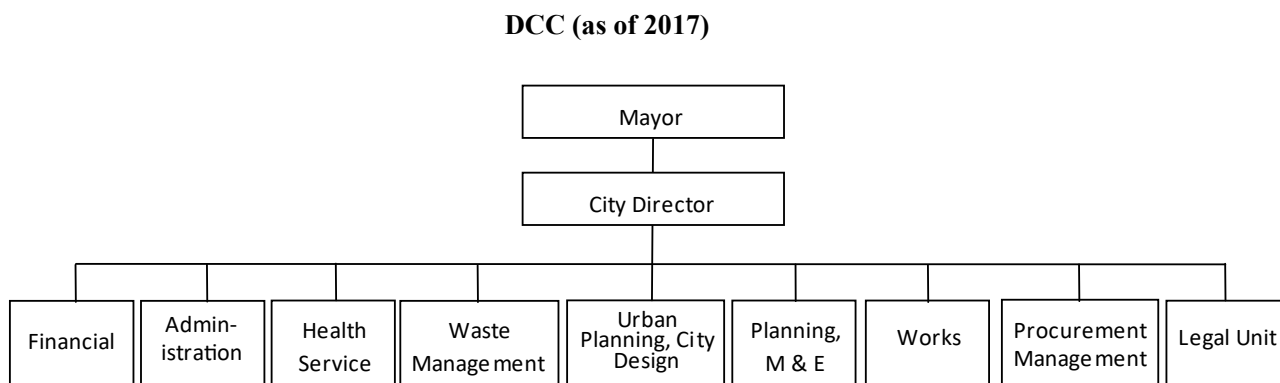


Source: PO-RALG, 2017

● Annex-2-3. Organizational Structure of DSM Region and DCC

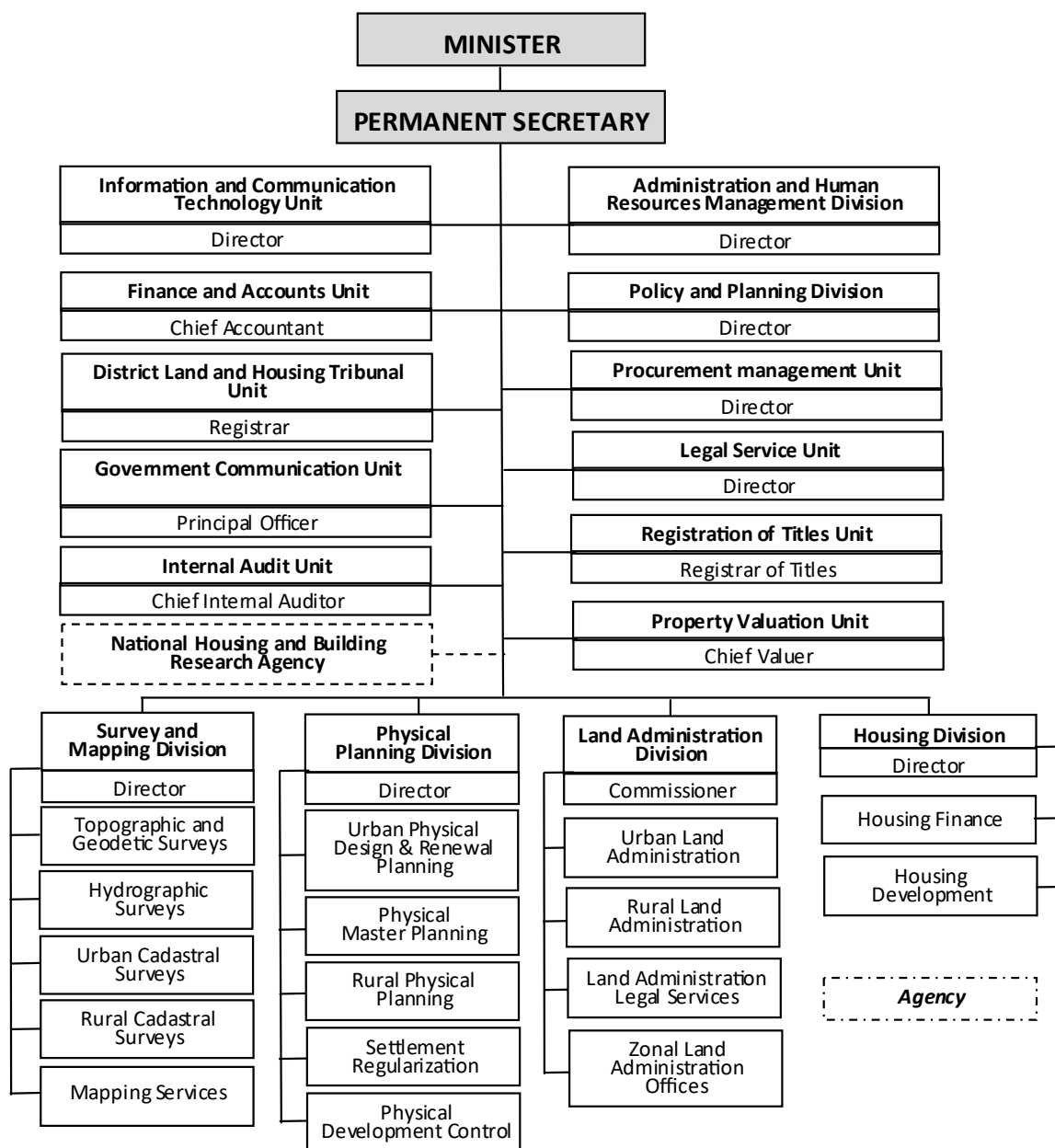


Source: The Function and Organization Structure of Regional Secretariats, President’s Office 2007. Updated by the Interview from DSM-RAS



Source: Interview from DCC, November 2017

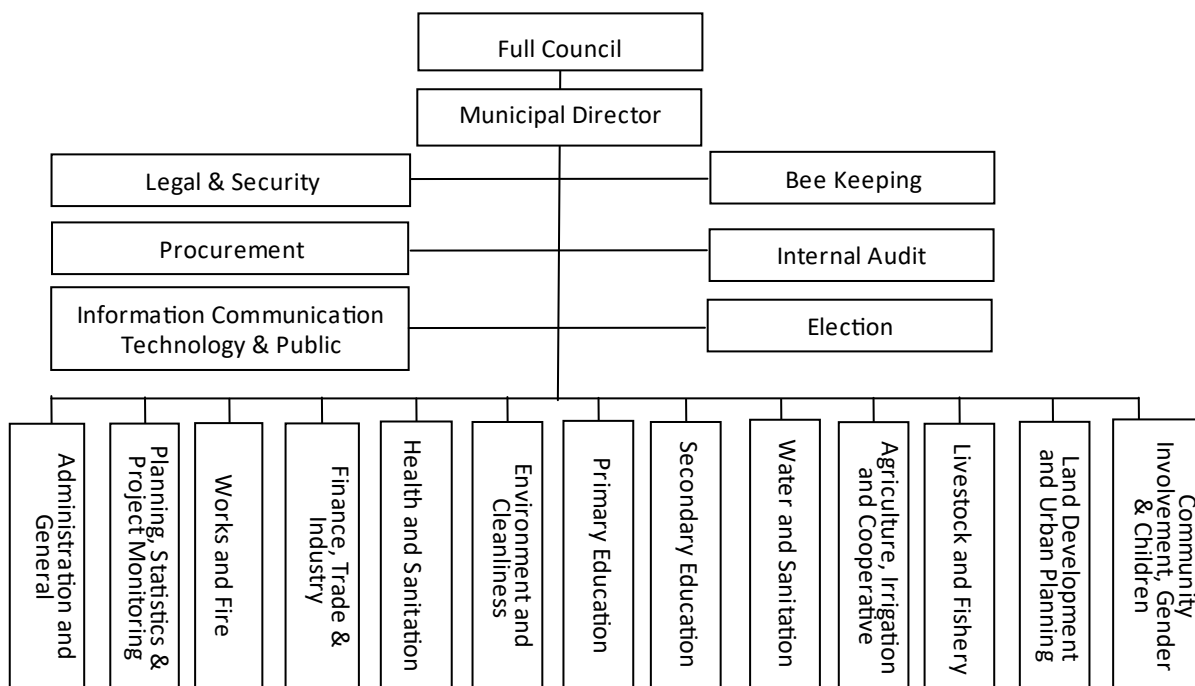
● Annex-2-4. Organizational Structure of MOLHSD



Source: Ministry of Land, Housing and Human Settlements Development, 2017

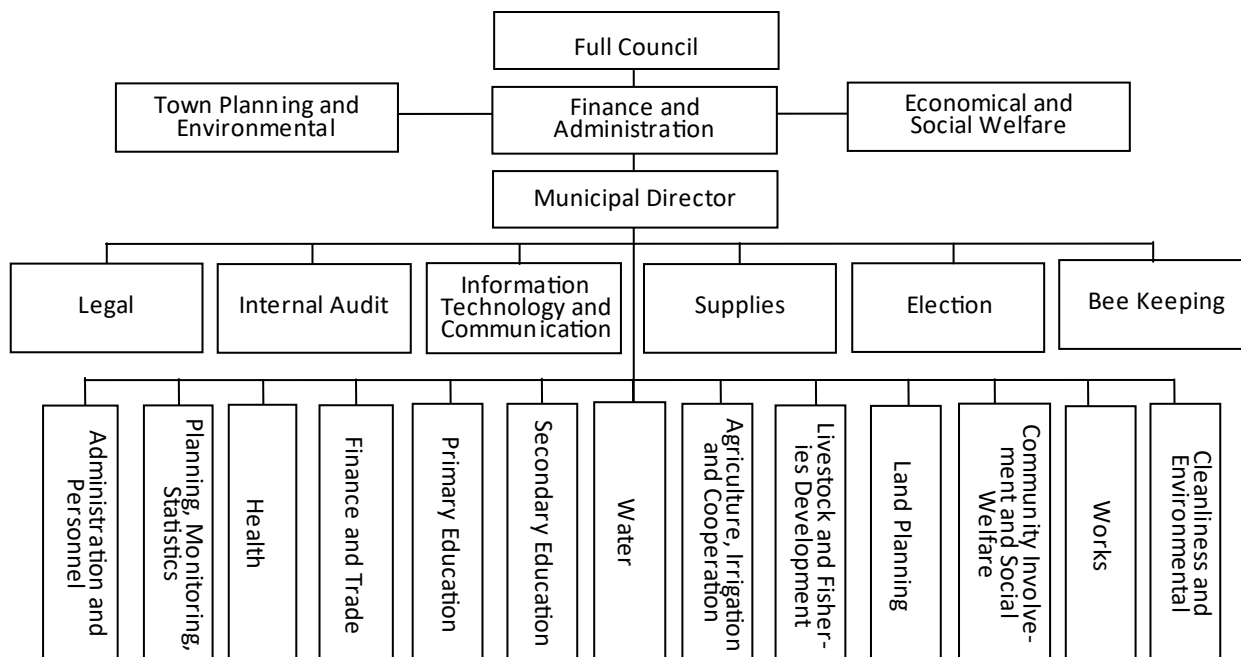
● Annex-2-5. Organizational Structure of Municipal Councils

**Kinondoni Municipal Council**



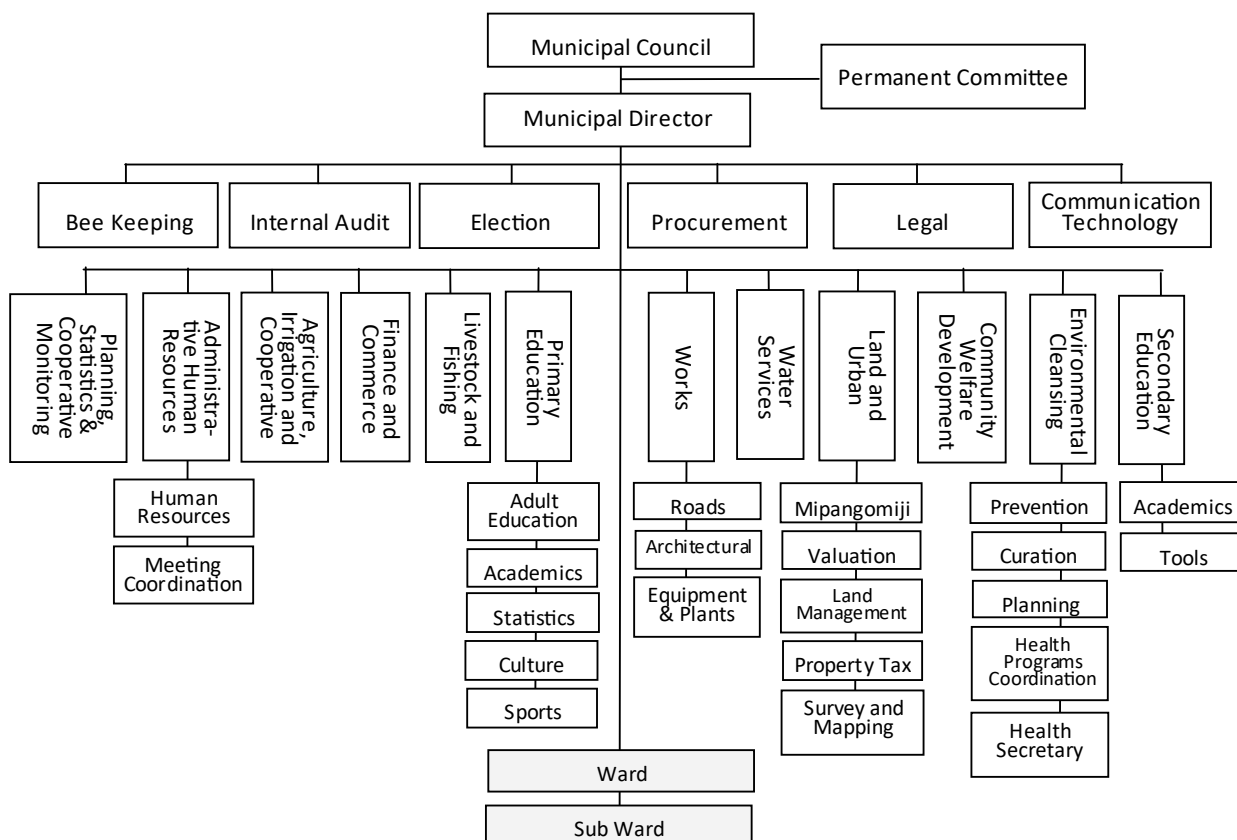
Source: Kinondoni Municipal Council

**Ilala Municipal Council**



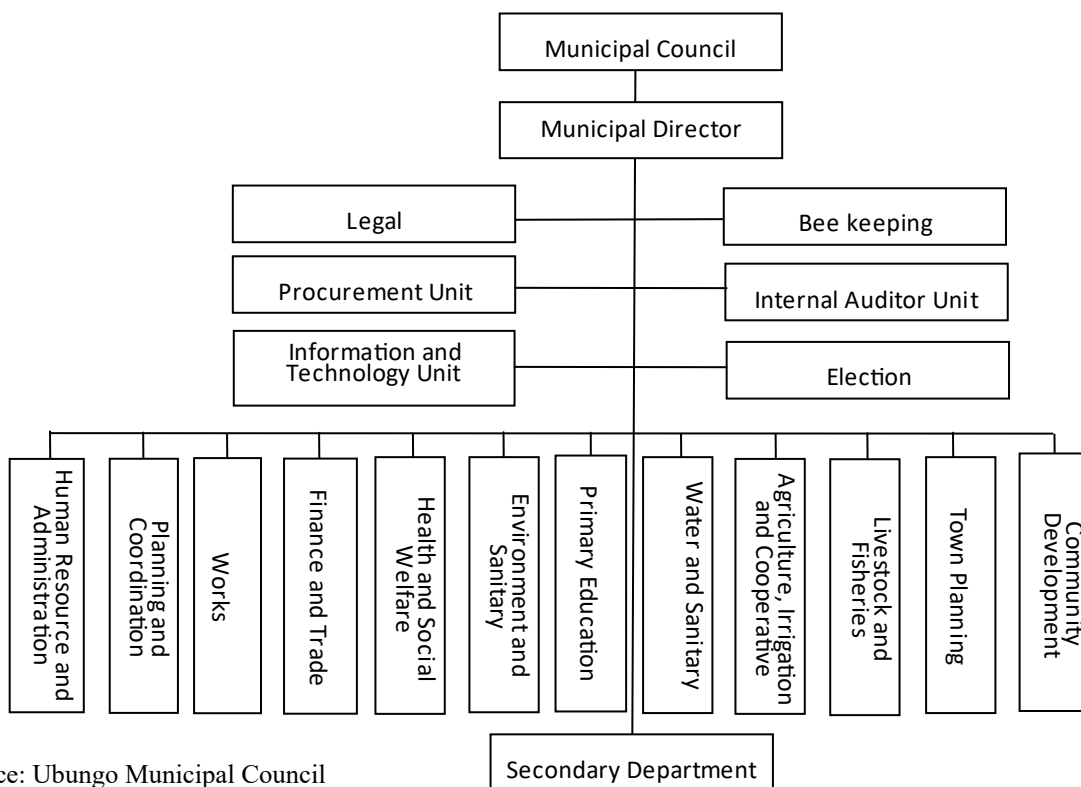
Source: Ilala Municipal Council

### Temeke Municipal Council



Source: Temeke Municipal Council

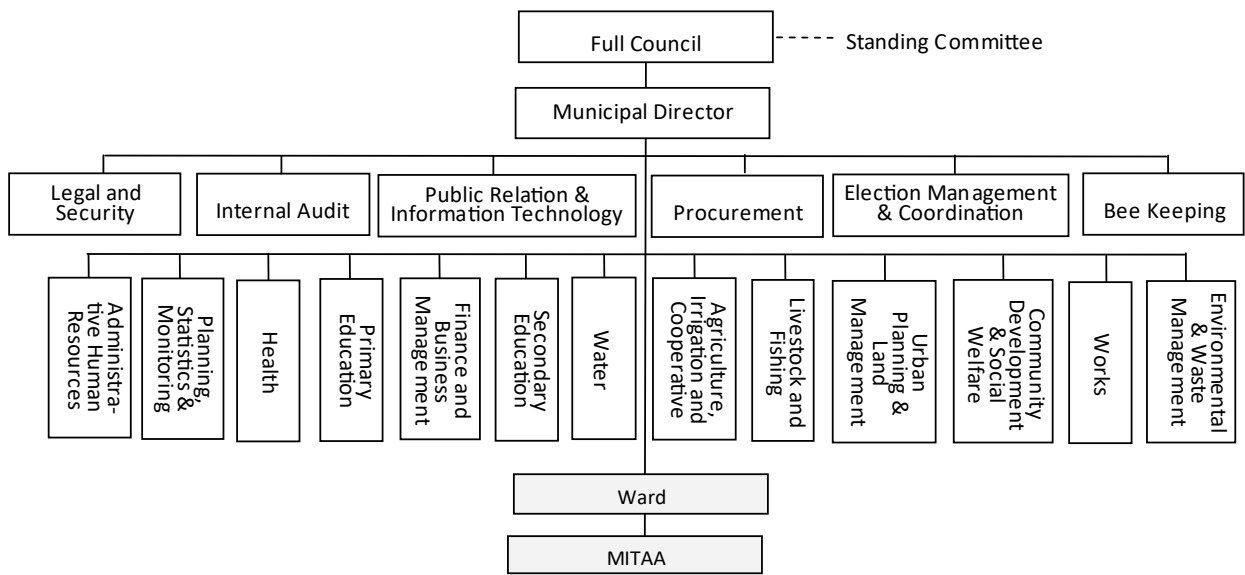
### Ubungu Municipal Council



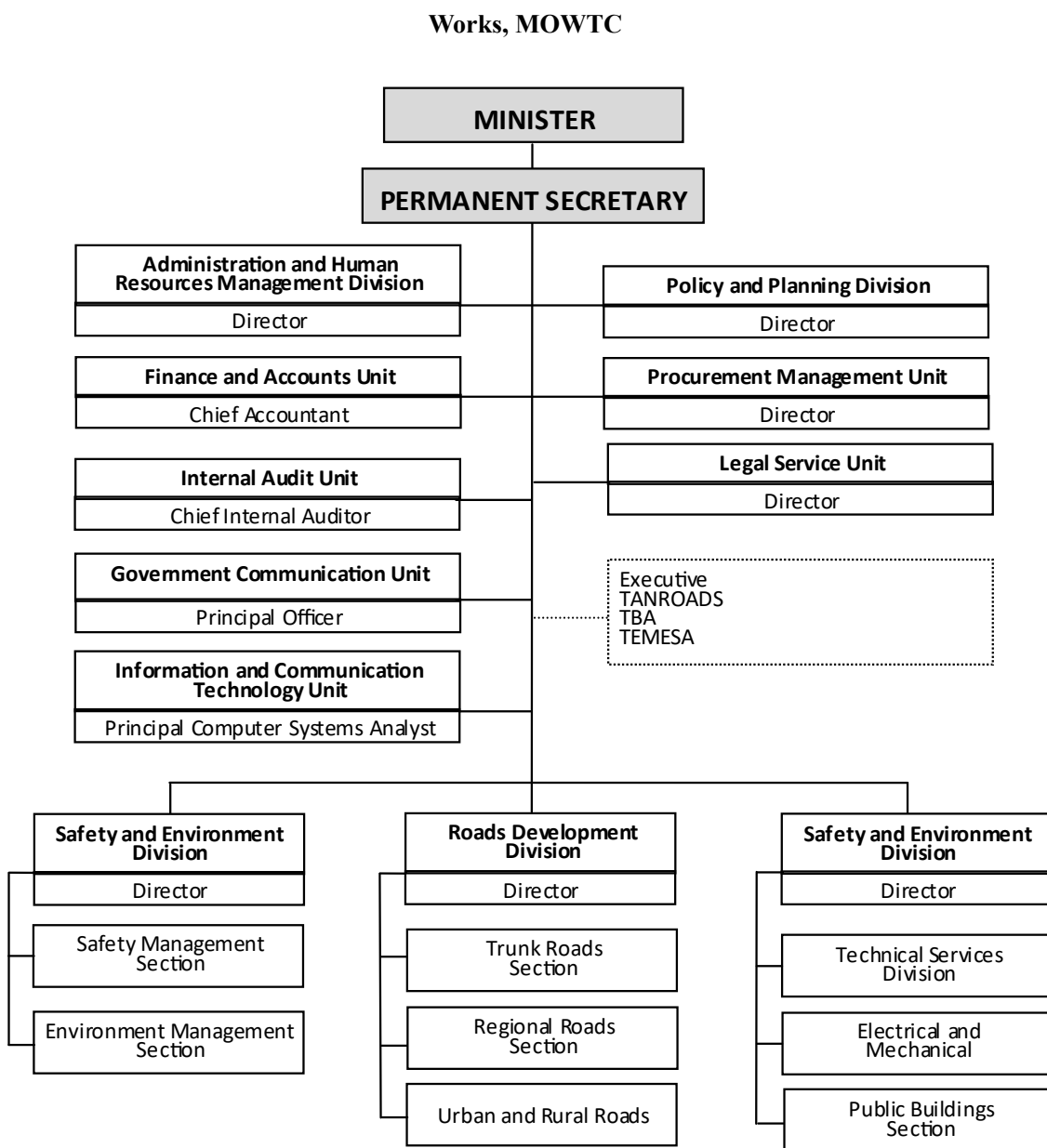
Source: Ubungu Municipal Council



**Kigamboni Municipal Council**

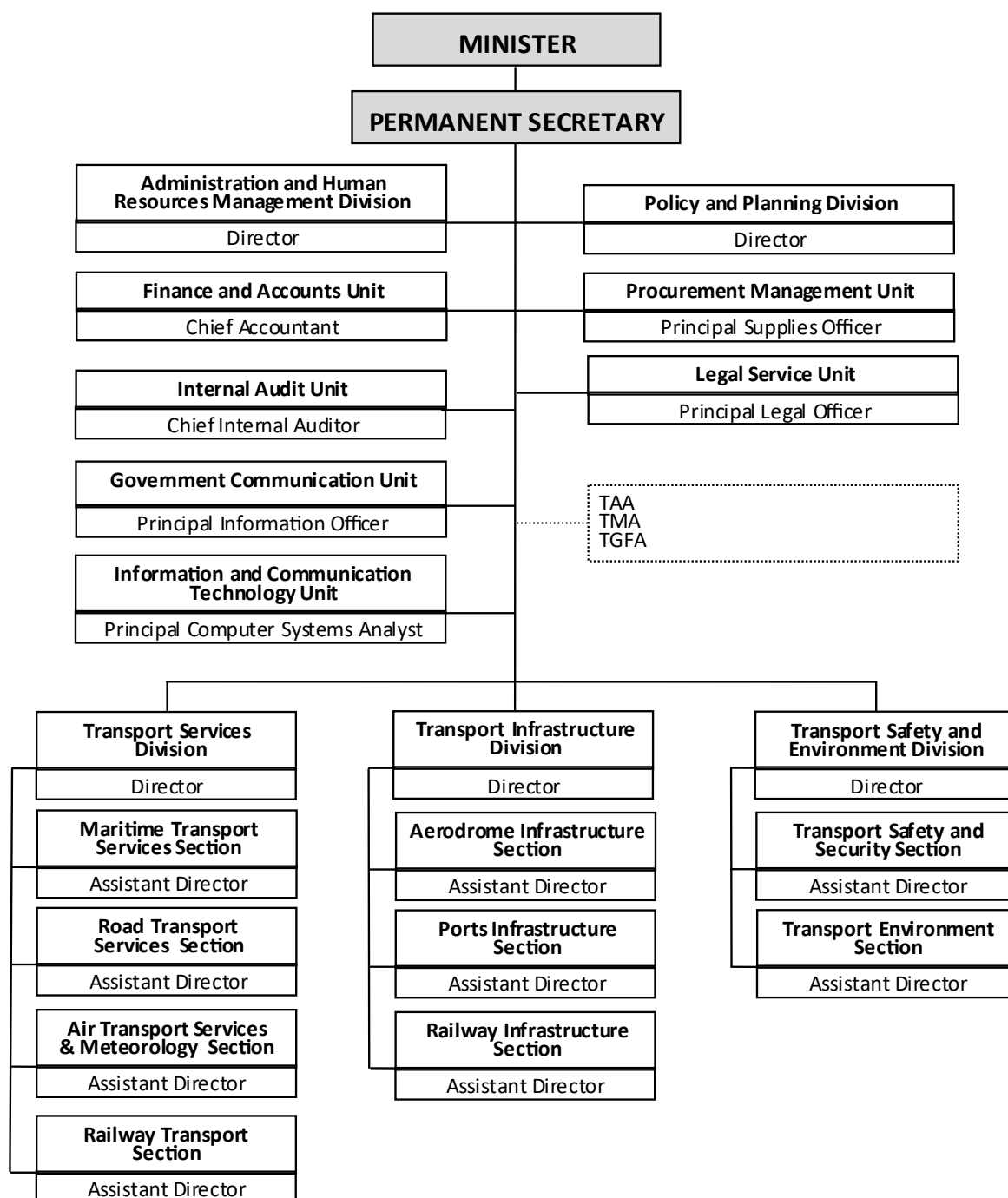


● Annex-2-6. Organizational Structure of MOWTC, Works and Transport



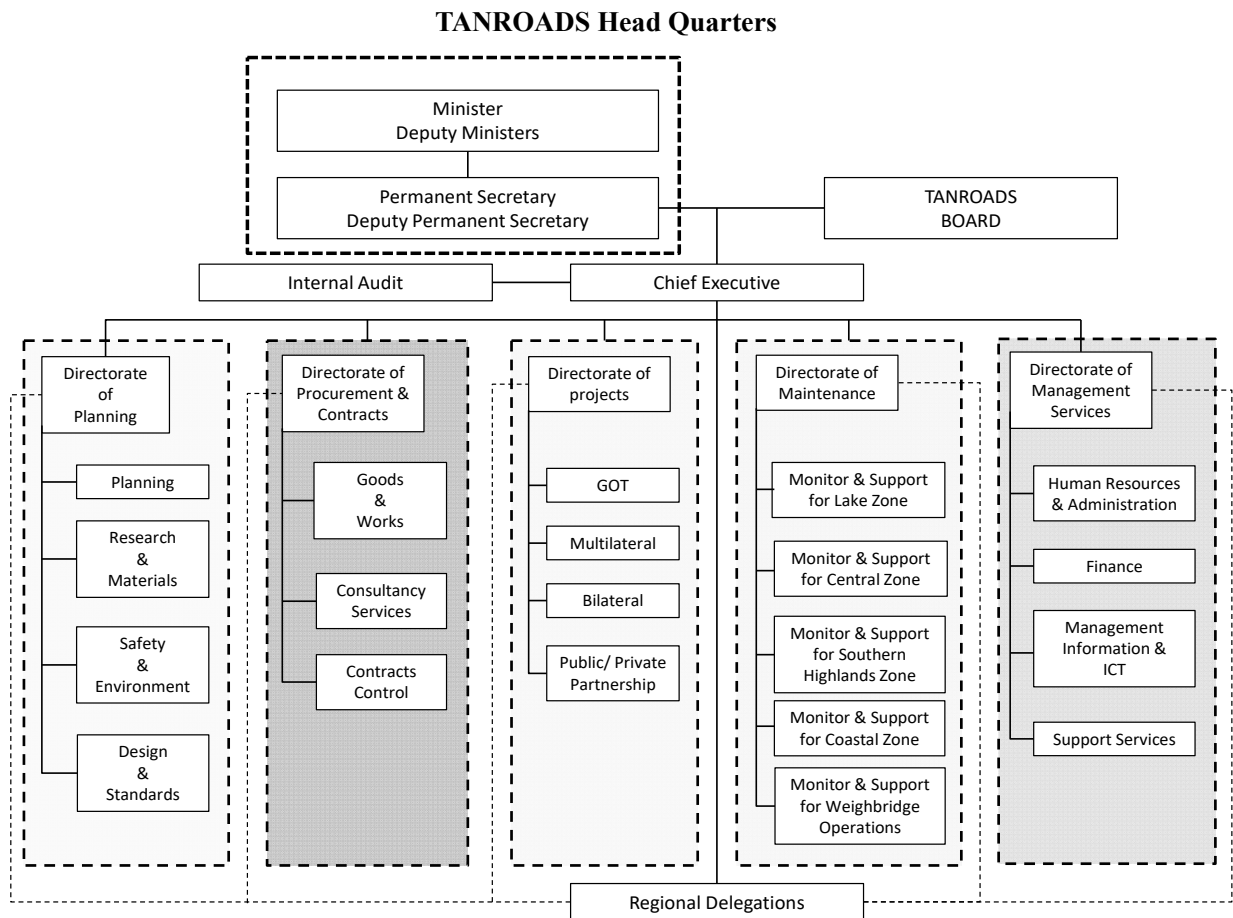
Source: MOWTC, Works Sector, WEB site 2017

**Transport, MOWTC**

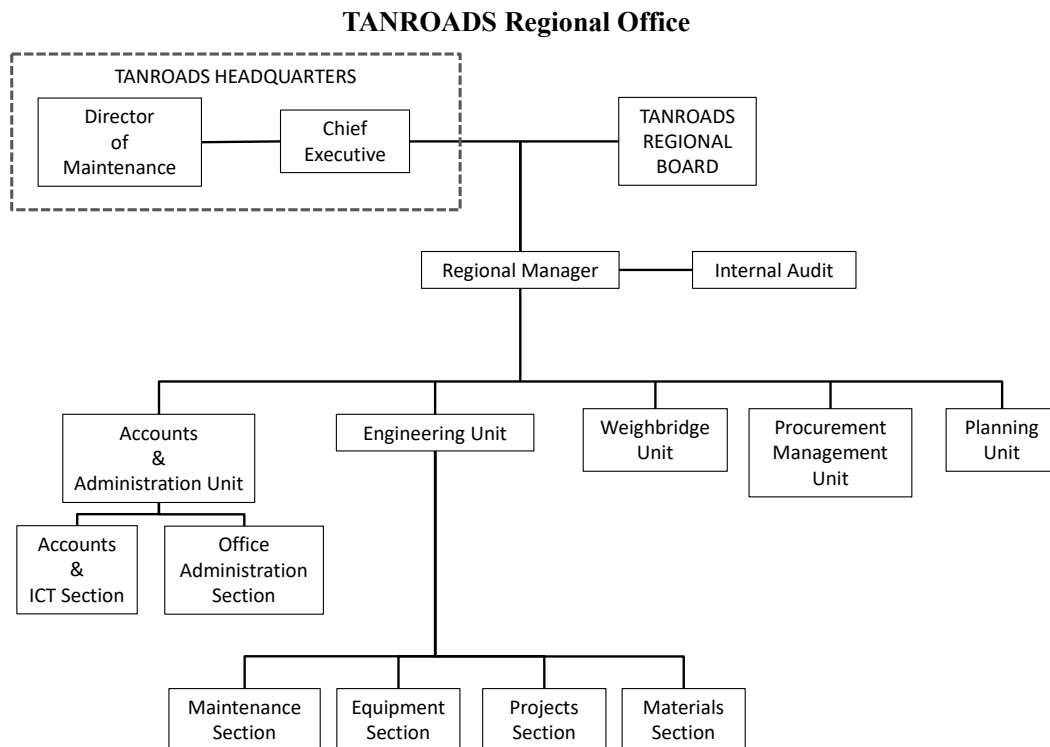


Source: MOWTC, Transport Sector WEB site 2017

● Annex 2-7. Organizational Structure of TANROADS HQ and Regional Office

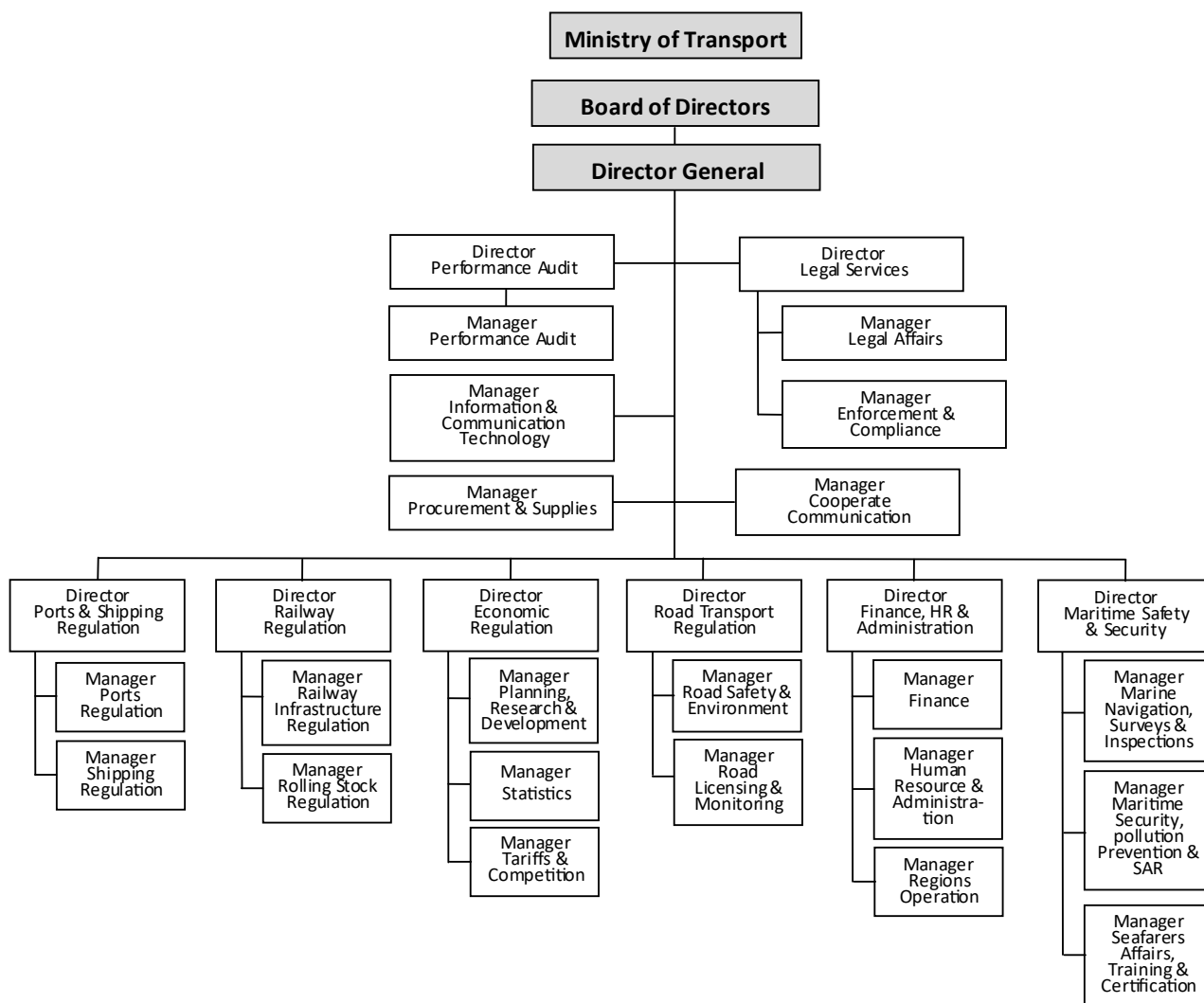


Source: TANROADS, March 2011



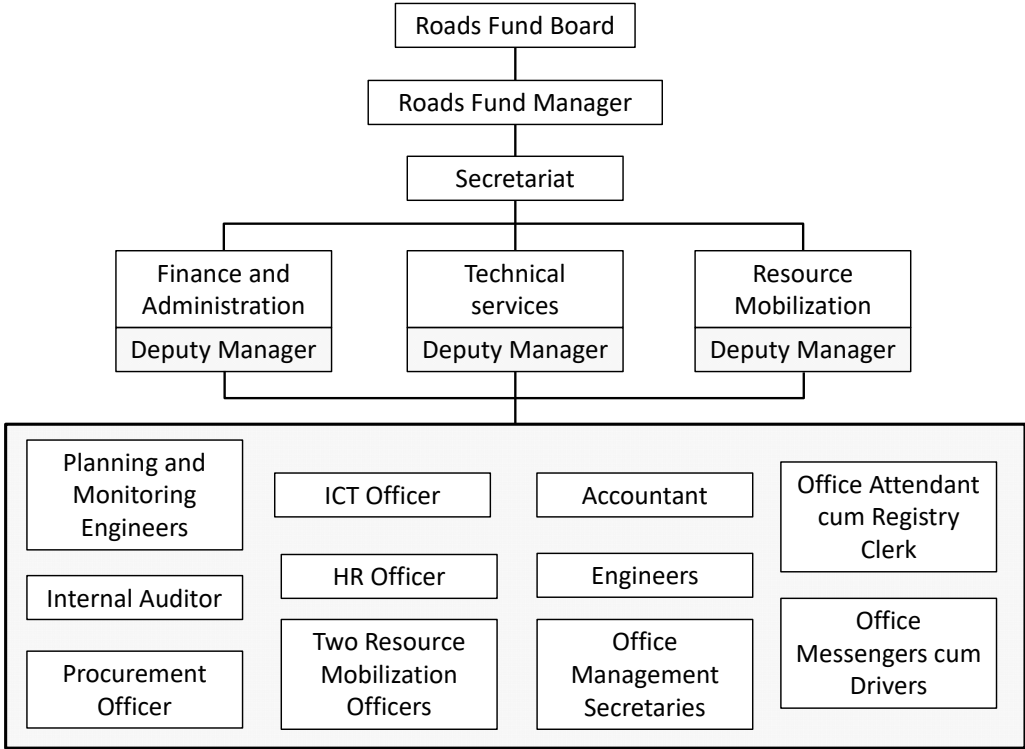
Source: TANROADS, March 2011

● Annex 2-8. Organizational Structure of SUMATRA



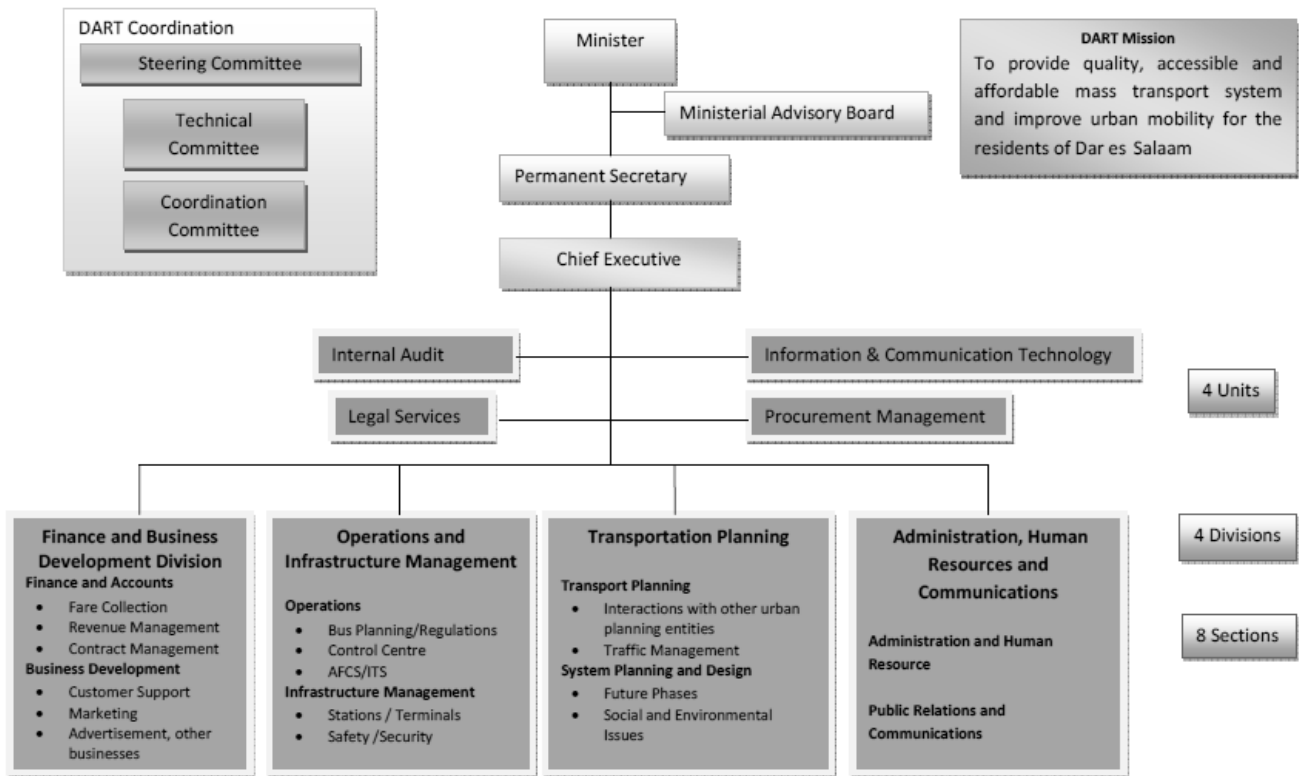
Source: SUMATRA, April 2017

● Annex 2-9. Organizational Structure of RFB



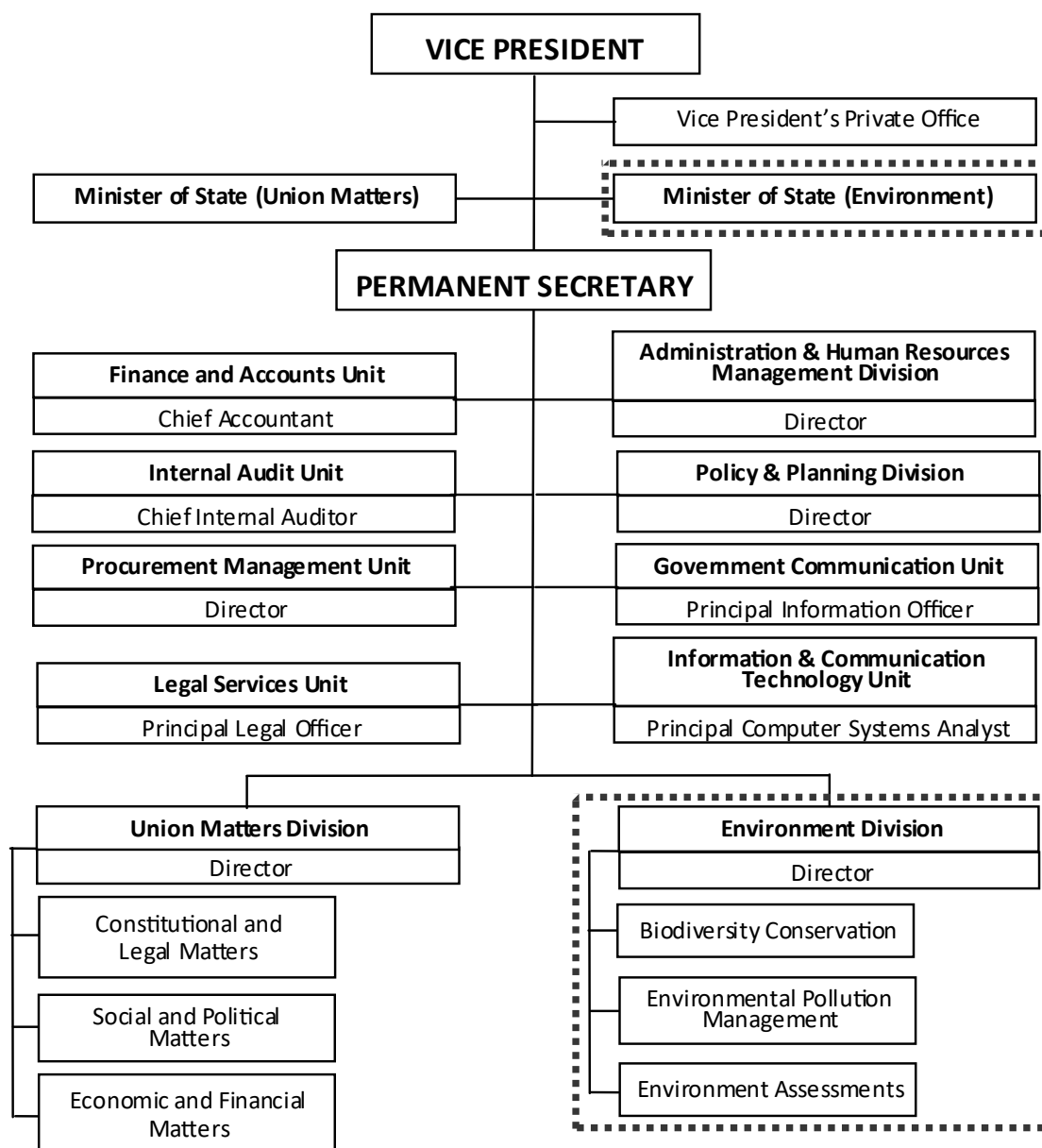
Source: RFB, 2016

● Annex 2-10. Organizational Structure of DART



Source: DART, WEB Site, June 2014

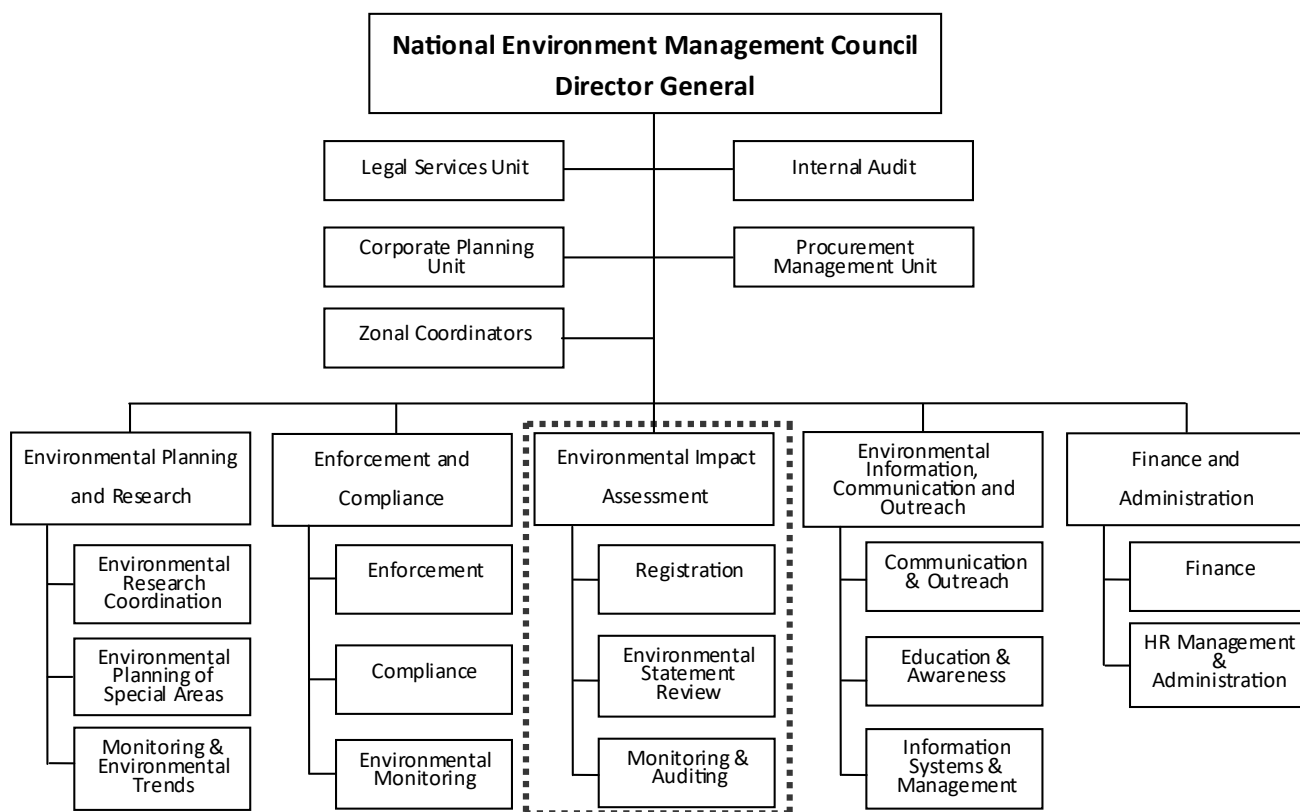
● Annex 2-11. Organizational Structure of VPO



Source: VPO, WEB Site, 2017



● Annex 2-12. Organizational Structure of NEMC



Source: Performance Audit Report on the Management of Environmental Impact Assessment Process in Development Projects, March 2016



## **Annex-3: Road and Public Transport Service (For Chapter-5)**

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- Annex 3-1: Long Distance Bus Routes Listed on a Fare Table
- Annex 3-2: Drawings of the Typical Cross Section
- Annex 3-3: Project Location Proposed by JICA-UTMP in 2008
- Annex 3-4: Passenger at Airports in Tanzania (2000-2015)
- Annex 3-5: Accident Type Classification
- Annex-3-6: Basic Information List of Traffic Signal in DSM



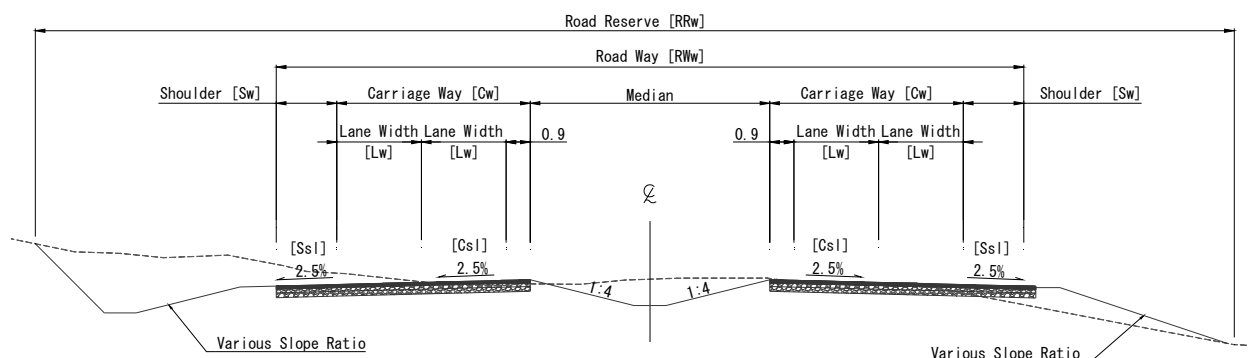
● Annex-3-1. Long Distance Bus Routes Listed on a Fare Table

Operation Route	
1	DAR ES SALAAM – DODOMA – NZEGA – TINDE – NGARA – RUSUMO
2	DAR ES SALAAM – DODOMA – NZEGA – LUSHANGA – BUKOBA – KARAGWE
3	DAR ES SALAAM – NZEGA – BUKENE – TABORA – URAMBO – UVINZA – KIGOMA
4	DAR ES SALAAM – DODOMA – SINGIDA – SINYANGA – MWANZA – MUSOMA
5	DAR ES SALAAM – DODOMA – SINGIDA – NZEGA – TABORA – SIKONGE – MPANDA
6	DAR ES SALAAM – DODOMA – NZEGA – KAHAMA – NYAKANAZI – KIGOMA
7	DAR ES SALAAM – DODOMA – KAHAMA – NYAKANAZI – UVINZA – MPANDA
8	DAR ES SALAAM – MOROGORO – IRINGA – MBEYA – TUNDUMA – SUMBAWANGA
9	DAR ES SALAAM – TUNDUMA – SUMBAWANGA – NAMANYERE – KIRANDO
10	DAR ES SALAAM – MOROGORO – IRINGA – UYOLE – TUKUYU – KYELA
11	DAR ES SALAAM – NJOMBE – SONGEA – PERAMIHO – MBAMBA BAY
12	DAR ES SALAAM – NJOMBE – MAKETE
13	DAR ES SALAAM – NJOMBE – LUDEWA – MANDA
14	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA
15	DAR ES SALAAM – TUNDUMA – HIMO – ROMBO – TARAKEA – RONGAI
16	DAR ES SALAAM – MOMBO – MKOMAZI – GONJA – KISIWANI
17	DAR ES SALAAM – MOMBO – LUSHOTO – BUMBULI
18	DAR ES SALAAM – MOMBO – LUSHOTO – MTAE
19	DAR ES SALAAM – MOMBO – LUSHOTO – MLALO
20	DAR ES SALAAM – MOMBO – LUSHOTO – MLOLA
21	DAR ES SALAAM – KOROGWE – MASHEWA
22	DAR ES SALAAM – SEGERA – TANGA – HOROHORO
23	DAR ES SALAAM – SEGERA – TANGA – PANGANI
24	DAR ES SALAAM – SEGERA – TANGA – NKINGA
25	DAR ES SALAAM – MKATA – HANDENI – SONGE
26	DAR ES SALAAM – LINDI – MTWARA – NEWALA
27	DAR ES SALAAM – LINDI – MINGOYO – MASASI – LIWALE – RUANGWA
28	DAR ES SALAAM – LINDI – MINGOYO – NANGANGA – RUANGWA
29	DAR ES SALAAM – LINDI – MINGOYO – NGONGO – RUANGWA
30	DAR ES SALAAM – LINDI – MINGOYO – MASASI – TUNDURU
31	DAR ES SALAAM – NANGURUKURU – KILWA
32	DAR ES SALAAM – NYAMWANMGE – UTETE
33	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – BABATI
34	DAR ES SALAAM – MIKUMI – IFAKARA – MAHENGE
35	DAR ES SALAAM – MIKUMI – IFAKARA – MBILINYI
36	DAR ES SALAAM – DODOMA – KONDOA – BABATI – MBULU – KARATU
37	DAR ES SALAAM – MOROGORO – DUMILA – KILOSA
38	DAR ES SALAAM – MOROGORO – MPWAPWA
39	DAR ES SALAAM – MOROGORO – DAKAWA – KIBAYA /KITETO
40	DAR ES SALAAM – MOROGORO – IRINGA – MAKAMBAKO – RUJUEWA – MBARALI
41	DAR ES SALAAM – MITEJA – KIPATIMU
42	DAR ES SALAAM – KAHAMA – CHATO – MULEBA – BUKOBA – KARAGWE
43	DAR ES SALAAM – LINDI – MASASI – NEWALA
44	DAR ES SALAAM – LINDI – MTAMA – NEWALA
45	DAR ES SALAAM – DODOMA – KAHAMA – MKOBA – GEITA
46	DAR ES SALAAM – LINDI – MINGOYO – MASASI – NANYUMBU
47	DAR ES SALAAM – LINDI – NANGANGA – NACHINGWEA – LIWALE
48	DAR ES SALAAM – LINDI – NANGANGA – NACHINGWEA – NANYUMBU
49	DAR ES SALAAM – DODOMA – KAHAMA – NGARA – KABANGA
50	DAR ES SALAAM – DODOMA – KAHAMA – NGARA – KABANGA
51	DAR ES SALAAM – MOROGORO – MATOMBO – DUTUMI – KISAKI
52	DAR ES SALAAM – NANGURUKURU – NJINJO – LIWALE
53	DAR ES SALAAM – LINDI – MINGOYO – MASASI – NACHINGWEA
54	DAR ES SALAAM – LINDI – NANGANGA – RUANGWA
55	DAR ES SALAAM – MOROGORO – DAKAWA – KIBAYA /KITETO – DALAI – BUSI
56	DAR ES SALAAM – MOROGORO – DAKAWA – KIBAYA – DALAI – BICHA – KONDOA
57	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – KARATU – MUGUMU
58	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – KARATU – MUSOMA
59	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – BABATI – KATESHI
60	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – KARATU – MBULU
61	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – BABATI – MBULU
62	DAR ES SALAAM – DODOMA – MTERA – IRINGA
63	DAR ES SALAAM – MOMBO – MOSHI – SANYA JUU
64	DAR ES SALAAM – MOROGORO – IRINGA – MBEYA – MPEMBA – ITUMBA (ILEJE)
65	DAR ES SALAAM – MOROGORO – IRINGA – MBEYA – CHUNYA
66	DAR ES SALAAM – DODOMA – SHINYANGA – MABUKI – NGUDU (KWIMBA)
67	DAR ES SALAAM – DODOMA – SHINYANGA – MASWA – BARIADI
68	DAR ES SALAAM – DODOMA – SHINYANGA – KISHAPU – MWAMHUNZI
69	DAR ES SALAAM – MOMBO – MOSHI – ARUSHA – MONDULI
70	DAR ES SALAAM – NZEGA – BUKENE – TABORA – URAMBO – UVINZA – KIGOMA
71	DAR ES SALAAM – DODOMA – MWANZA – ILEMELA
72	DAR ES SALAAM – MBEYA – TUNDUMA – SUMBAWANGA – MPANDA – INYONGA
73	DAR ES SALAAM – DODOMA – KAHAMA – MKOBA – GEITA – SENGEREMA
74	DAR ES SALAAM – LINDI – MASASI – NANYUMBU – MTAMBASWALADAR
75	DAR ES SALAAM – DODOMA – SINGIDA – KIOMBOI
76	DAR ES SALAAM – LINDI – NGONGO – RUTAMBA – MILOLA
77	DAR ES SALAAM – DODOMA – SINGIDA – KATESH – BABATI
78	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – KARARU – MUSOMA
79	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – BABATI – MBULU
80	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – MONDULI
81	DAR ES SALAAM – BAGAMOYO – MSATA – MOSHI – SANYA JUU
82	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – SINGIDA
83	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – KATATU – MUGUMU
84	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – KATATU – LOLIONDO
85	DAR ES SALAAM – BAGAMOYO – MSATA – ARUSHA – KATATU – LOLIONDO
86	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – LUSHOTO – MTAE
87	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – LUSHOTO – MLALO
88	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – LUSHOTO – MLOLA
89	DAR ES SALAAM – BAGAMOYO – MSATA – KOROGWE – MASHEWA
90	DAR ES SALAAM – BAGAMOYO – MSATA – ROMBO – TAKAKEA – RONGAI
91	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – MKOMAZI – GOJA – KISIWANI
92	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – MKOMAZI – MNAZI
93	DAR ES SALAAM – BAGAMOYO – MSATA – MOMBO – MKOMAZI – MAMBA MIAMBA
94	DAR ES SALAAM – KIBAHA – MSATA – MOMBO – MKOMAZI – MAMBA MIAMBA
95	DAR ES SALAAM – SEGERA – TANGA – HOROHORO
96	DAR ES SALAAM – SEGERA – TANGA – PANGANI
97	DAR ES SALAAM – SEGERA – TANGA – NKINGA
98	DAR ES SALAAM – MKATA – HANDENI – SONGE
99	DAR ES SALAAM – KIBAHA HANDENI – KIBAYA – ORKESUMET – ARUSHA
100	DAR ES SALAAM – KIBAHA HANDENI – KIBAYA – ORKESUMET – ARUSHA
101	DAR ES SALAAM – DODOMA – MANYONI – ITIGI – CHAYA – TABORA – KIGOMA
102	DAR ES SALAAM – DODOMA – MANYONI – ITIGI – CHUNYA – MBEYA
103	DAR ES SALAAM – MANYONI – ITIGI – RUNGWA – MPANDA SUMBAWANGA

Source: Maximum (capped) economic bus fares between DSM and other regional centres / districts / towns applicable with effect from 12 APRIL, 2013

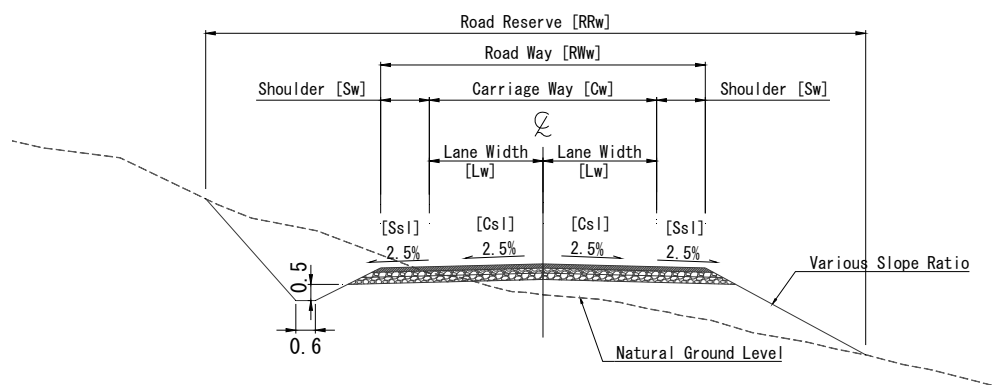
● Annex 3-2: Drawings of the Typical Cross Section

**Typical Cross Section for a Dual Carriageway, Design Class 1**



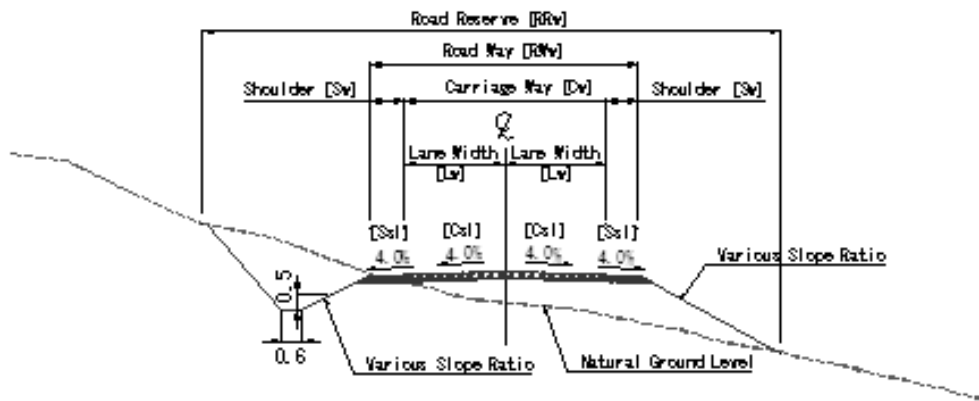
Design Class	Dimension (m)						Slope (%)		Median* width (m)
	RRw	RWw	Cw	No. of Lanes	Lw	Sw	Csl	Ssl	
1	60	28.0 to 31.0	2x7.0	4	3.5	2.5	2.5	2.5	9.0 to 12.0

**Typical Cross Section for Two Lane Paved Roads, Design Class 2 to 5**



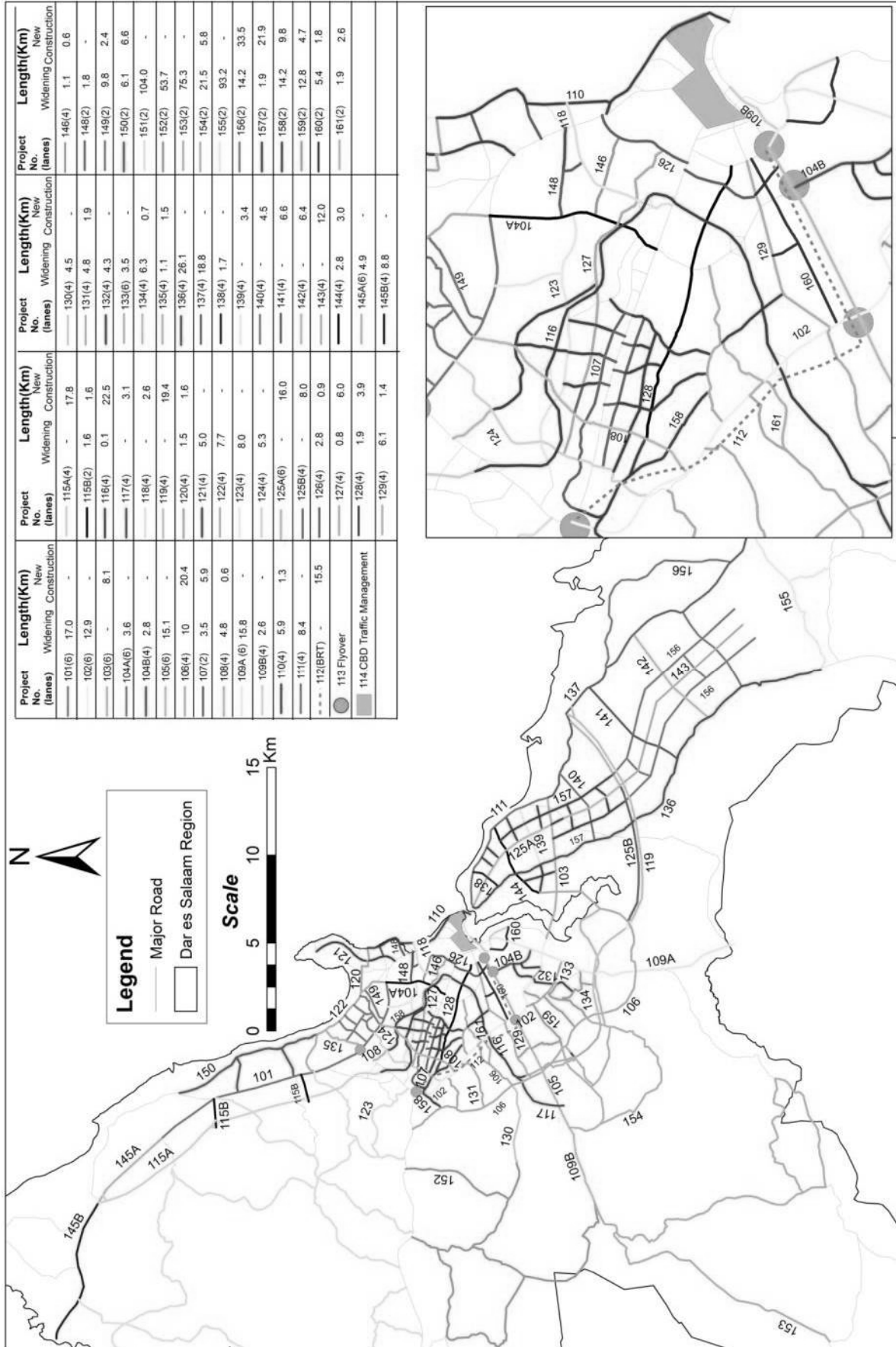
Design Class	Dimension (m)						Slope (%)	
	RRw	RWw	Cw	No. of Lanes	Lw	Sw	Csl	Ssl
2	60	11.5	7.5	2	3.75*	2.0	2.5	2.5
3	60	11.0	7.5	2	3.50	2.0	2.5	2.5
4	60	9.5	6.5	2	3.25	1.5	2.5	2.5
5	60	8.5	6.5	2	3.25	1.0	2.5	2.5

**Typical Cross Section for Gravel or Earth Roads, Design Class 6 to 8**



Design Class	Dimension (m)						Slope (%)		Surface type
	RRw	RWw	Cw	No. of Lanes	Lw	Sw	Csl	Ssl	
6	40	11.5	7.5	2	3.0	1.0	4	4	Gravel or paved
7	30	11.0	7.5	2	2.75	1.0	4	4	Gravel
8	20	9.5	6.0	1	4	1.0	4	4	Earth or gravel

● Annex 3-3. Project Location Proposed by JICA-UTMP in 2008



Annex 3-4



● Annex 3-4. Passenger at Airports in Tanzania (2000-2015)

AIRPORT	2000	2001	2002	2003	2004	2005	2006	2007
JNIA (DSM)	621,513	652,002	703,483	822,398	1,011,392	1,124,235	1,249,419	1,450,558
KIA (Kilimanjaro)	208,248	221,106	192,205	184,652	294,750	363,512	480,053	586,143
Zanzibar	254,126	203,586	307,765	317,308	452,176	484,405	544,861	600,359
MWANZA	100,845	119,695	110,961	137,767	161,213	186,590	203,033	229,870
ARUSHA	74,371	81,453	95,184	99,395	87,252	83,405	76,173	69,273
Others	122,297	141,030	152,010	170,875	193,281	215,935	213,417	241,055
<b>Total</b>	<b>1,381,400</b>	<b>1,418,872</b>	<b>1,561,608</b>	<b>1,732,395</b>	<b>2,200,064</b>	<b>2,458,082</b>	<b>2,766,956</b>	<b>3,177,258</b>

AIRPORT	2008	2009	2010	2011	2012	2013	2014	2015
JNIA (DSM)	1,542,778	1,422,846	1,556,410	1,829,219	2,088,282	2,348,819	2,478,055	2,496,394
KIA (Kilimanjaro)	520,308	427,816	477,206	659,181	665,108	824,848	802,371	780,800
Zanzibar	573,412	568,357	614,449	736,145	798,441	856,607	934,337	878,789
MWANZA	229,496	224,207	227,479	319,749	392,298	439,128	415,674	444,215
ARUSHA	130,602	122,621	154,174	112,433	162,268	187,911	179,511	142,224
Others	215,818	200,982	199,190	221,222	253,021	296,761	383,317	372,413
<b>Total</b>	<b>3,212,414</b>	<b>2,966,829</b>	<b>3,228,908</b>	<b>3,877,949</b>	<b>4,359,418</b>	<b>4,954,074</b>	<b>5,193,265</b>	<b>5,114,835</b>

Source: TAA

● Annex 3-5. Accident Type Classification

G ACCIDENT TYPE CLASSIFICATION IN 7 CATEGORIES "CAT" (tick only one most relevant)	
<b>CAT. 1: Single vehicle accidents</b>	
101	Leave road to left in left corner
102	Leave road straight from right corner
103	Leave straight road to the side
104	Leave road straight in left corner
105	Leave road to the right in right corner
106	Center collision roundabout
107	Leave road within crossing or diverge
108	Reverse or return
109	Falling or injury within vehicle
110	Coll. with fixed obstacles on road
111	Tree on car
<b>CAT. 2: Accidents between vehicles driving same travel direction (2 or more vehicles)</b>	
201	Collision while passing
202	Lane change to left
203	Lane change left 2nd vehi. leav. roa.
204	Lane change to right
205	Lane change right 2nd vehi. leav. roa.
206	Coll. roundabout incoming vehic.
207	Rear accid. outside junct. on road
208	Rear side accident left corner
209	Rear side accident right corner
210	Rear accid. junct. 1st vehi. stops
<b>CAT. 3: Accidents between vehicles driving opposite travel direction (2 or more vehicles)</b>	
301	Head coll. while changing lane
302	Leave / change left / right due op. vehi.
303	Coll. roundabout outgoing vehicle
304	Leave left corner left, due op. vehi.
305	Leave left corner right due op. vehi.
306	Leave right corner right due op. vehi.
307	Leave right corner left due op. vehi.
308	Graze collision on straight road
<b>CAT. 4: Accidents at a junct. turning in same or oppo. direction (2 or more vehi.)</b>	
401	Collision left turn with straight drive
402	Collision 2 left turning vehicles
403	Rear accident while turning right
404	Coll. right turn with straight drive
405	Coll. of 2 right turning vehicles
<b>CAT. 5: Collision at a junction between two or more participants</b>	
501	Coll. U-turn at junction same dir.
502	Coll. in same dir. right turn
503	Coll. opposing traffic right turn
504	Coll. of two left turn. vehicles
505	Collision of two right turn. vehi.
<b>CAT. 6: Accidents w. parked vehicles</b>	
601	Parked vehicle, rear accident
602	Parked vehicle while pass. right
603	Parked vehicle while passing left
701	Ped. crosses after minor road left
702	Ped. crosses before minor road
703	Ped. walks parall. vehicle turn left
704	Ped. walks parall. vehicle turn right
705	Ped. walks oppo. vehicle turn right
706	Coll. outside jun., Ped. from left
<b>CAT. 7: Pedestrian, animals and other accidents</b>	
707	Coll. outs. jun., Ped. from right
708	Pedestrian walks on road left
709	Pedestrian walks on road right
710	Coll. pedestrian on road side
711	Coll. with ped. while reversing
712	Coll. ped. enter. an entrance
713	Collision ped. leav. an entrance
714	Coll. pedestrian roundabout
715	Animal on the road
716	Accident with train
717	Coll. on Ferry manoeuvring

Source: Ministry of Works, Transportation, and Communication

● Annex-3-6. Basic Information List of Traffic Signal in DSM

S/N	Location (Route)	Intersection (Point)	Controller Model/Type	Year of Installation	
1	<b>BRT PHASE I</b>				
	<b>MOROGORO ROAD</b>				
		1.Morogoro/Bibi Titi	LUNAR 24-E230	2015	
		2.Morogoro/Lumumba	LUNAR 24-E230	2015	
		3.Morogoro/Msimbazi	LUNAR 24-E230	2015	
		4.Morogoro/United Nation	LUNAR 24-E230	2015	
		5.Jangwani U-turn	LUNAR 24-E230	2015	
		6.Magomeni Mapipa	LUNAR 24-E230	2015	
		7.Morogoro/Kawawa	LUNAR 24-E230	2015	
		8.Mwembechai U-turn	LUNAR 24-E230	2015	
		9.Mabibo U-turn	LUNAR 24-E230	2015	
		10.Shekilango	LUNAR 24-E230	2015	
		11.Ubungo Terminal	LUNAR 24-E230	2015	
		12.Morogoro/Mandela	LUNAR 24-E230	2015	
		13.Kibo U-turn	LUNAR 24-E230	2015	
		14.Bucher U-turn	LUNAR 24-E230	2015	
		<b>(B) KAWAWA ROAD</b>			
			1.Magomeni Kanisani U-turn	LUNAR 24-E230	2015
			2.Mwinyijuma	LUNAR 24-E230	2015
			3.Mwanamboka	LUNAR 24-E230	2015
			4.Kawawa/Dunga	LUNAR 24-E23	2015
			5.Moroco U-turn	LUNAR 24-E230	2015
		<b>(C) MSIMBAZI ROAD</b>			
			1.Msimbazi/Swahili	LUNAR 24-E230	2015
			2.Msimbazi/Mafia	LUNAR 24-E230	2015
			3.Msimbazi/Uhuru	LUNAR 24-E230	2015
			4.Msimbazi/Lindi	LUNAR 24-E230	2015
	2	<b>ALLY HASSAN</b>			
			1.Ally Hassan Mwinyi/Ohio (Serena)	XC3-60R-E	2013
			2.Agakhani	Kyosan	1995
			3.Palm beach	XC3-60R-E	2013
			4.Selander	XC3-60R-E	2013
			5.Kenyata	PL-4D (22G)	2010

		6.St. Peter	Kyosan	1995
		7.Namanga	JK-C	2012
		8.Moroco	Kyosan	1995
		9.Sayansi	PL -5D (22G)	2010
		10.Bamaga	PL -5D (22G)	2010
		11. Mwenge	XC3-60R-E	2013
<b>3</b>	<b>NYERERE ROAD</b>	1.Maktaba	Kyosan	1995
		2.Mnazi mmoja	XC3-60R-E	2013
		3.Co-Cabs	JK-C	2012
		4.KAMATA	XC3-60R-E	2013
		5.Chang'ombe VETA	Kyosan	1995
		6.Mandela/Nyerere	PL -5D (22G)	2010
		7.Vingunguti	PL -5D (22G)	2010
		8.Jet	PL-4D (22G)	2010
		9.Air port	PL -5D (22G)	2010
		10.Nyerere/ Segerea	PL -5D (22G)	2010
		11.JET/Nyerere	LUNAR 24-E230	2015
<b>4</b>	<b>MANDELA ROAD</b>	1.Mandela/Kilwa	XC3-60R-E	2013
		2.Chang'ombe Serengeti	XC3-60R-E	2013
		3.Sokota	PL -5D (22G)	2010
		4.Buguruni	PL-4D (22G)	2010
		5.Tabata	XC3-60R-E	2013
		6.External	PL -5D (22G)	2010
		7.University Road	XC3-60R-E	2013
		8.Igesa	XC3-60R-E	2013
<b>5</b>	<b>KAWAWA ROAD</b>	1.Karume	Kyosan	1995

Note: Nill means the controller hasn't yet undergone maintenance

Source: TEMESA

## **Annex-4: Traffic Survey**

### **(For Chapter-5)**

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- Annex 4-1: Results of Cordon Line Survey
- Annex 4-2: Results of Screen Line Survey
- Annex 4-3: Results of Traffic Volume Count Survey
- Annex 4-4: Zone Code Table for OD survey
- Annex 4-5: Zone Code Map
- Annex 4-6: Number of Samples and Expansion Factor for Household Interview Survey (Ward)
- Annex 4-7: Trip Distance Distribution by Transport Mode
- Annex 4-8: D-value on Radial Roads and Ring Roads
- Annex 4-9: OD Interview Result
- Annex 4-10: Public Transport Users and Car Users Interview Survey Result
- Annex 4-11: List of Freight Transport Company Interview Survey
- Annex 4-12: Result of Travel Speed Survey
- Annex 4-13: Result of Roadside Parking Survey



● Annex-4-1. Results of Cordon Line Survey

Location Map



## Result of Cordon Line Survey (Traffic Volume Counts)

No.	Survey Point	Road Name	Direction	Passenger Car	Taxi	Pick-up & Van	Microbus (Dala-dala)	Medium (Dala-dala)	Large bus	BRT	Organization Bus	2 Axle Truck (Light Truck)	3 Axle Truck (Dump Truck)	Heavy Truck	Motorcycle	Bajaj / (3 Wheels Motor Taxi)	Motorized Vehicle Total	NMT (Bicycle, Pushcart, etc)	Total
CL-1	BUNJU (CL-1)	Bagamoyo Road	Inbound	1,327	7	165	24	380	1	-	50	282	96	113	1,539	54	4,038	89	4,127
			outbound	1,368	4	184	15	316	4	-	38	263	55	87	1,415	42	3,791	148	3,939
			Total	2,695	11	349	39	696	5	-	88	545	151	200	2,954	96	7,829	237	8,066
CL-2	KIBAHA (CL-2)	Morogoro Road	Inbound	2,337	1	281	222	777	329	-	11	889	126	680	1,071	37	6,761	61	6,822
			outbound	1,693	5	218	131	660	332	-	60	733	73	769	719	30	5,423	36	5,459
			Total	4,030	6	499	353	1,437	661	-	71	1,622	199	1,449	1,790	67	12,184	97	12,281
CL-3	KISARAWA (CL-3)	PUGU ROAD	Inbound	305	1	38	48	91	4	-	8	113	53	48	273	14	996	14	1,010
			outbound	338	2	33	48	73	7	-	6	67	133	20	305	16	1,048	17	1,065
			Total	643	3	71	96	164	11	-	14	180	186	68	578	30	2,044	31	2,075
CL-4	MKURANGA (CL-4)	KILWA Road	Inbound	1,063	10	114	509	642	57	-	46	406	61	165	1,637	74	4,784	122	4,906
			outbound	1,114	14	177	510	667	47	-	46	295	151	198	1,600	82	4,901	126	5,027
			Total	2,177	24	291	1,019	1,309	104	-	92	701	212	363	3,237	156	9,685	248	9,933
CL-5	MIMWEMA (CL-5)	KIGAMBONI	Inbound	2,047	8	147	716	262	-	-	15	209	19	8	1,788	251	5,470	448	5,918
			outbound	1,746	8	157	726	272	-	-	44	192	51	6	1,566	219	4,987	447	5,434
			Total	3,793	16	304	1,442	534	-	-	59	401	70	14	3,354	470	10,457	895	11,352
CL-6(T1)	AIRPORT-TWL 1 -(CL-6)	Nyerere Road	Inbound	512	60	40	4	-	-	-	76	16	-	-	38	3	795	2	797
			outbound	612	80	44	2	-	-	-	48	4	8	2	45	5	850	12	862
			Total	1,170	140	84	6	-	-	-	124	20	8	2	83	8	1,645	14	1,659
CL-6(T2)	AIRPORT-TWL 2 -(CL-6)	Nyerere Road	Inbound	2,187	228	81	-	-	-	-	75	17	-	-	20	2	2,610	5	2,615
			outbound	2,073	272	97	-	-	-	-	112	16	-	-	19	3	2,592	5	2,597
			Total	4,260	500	178	-	-	-	-	187	33	-	-	39	5	5,202	10	5,212
CL-6(T1 passenger) (SL3-14(T1))	AIRPORT Terminal 1-Passenger		Inbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			outbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CL-6(T2 passenger) (SL3-14(T2))	AIRPORT Terminal 2-Passenger		Inbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			outbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CL-7(G3)	TPA-(CL-7) Gate 3:	Bandari Rd	Inbound	1,054	-	135	10	2	-	-	11	84	82	336	231	69	2,014	54	2,068
			outbound	786	-	90	1	-	-	-	12	37	25	453	147	60	1,611	42	1,653
			Total	1,840	-	225	11	2	-	-	23	121	107	789	378	129	3,625	96	3,721
CL-7(G5)	TPA-(CL-7) Gate 5: Operation - Outbound only	Bandari Rd	Inbound	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			outbound	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Total	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CL-7(G8)	TPA-(CL-7) Gate 8: Operation - Outbound only	Bandari Rd	Inbound	19	-	10	-	-	-	-	-	3	-	231	34	3	300	1	301
			outbound	19	-	10	-	-	-	-	-	3	-	231	34	3	300	1	301
			Total	38	-	20	-	-	-	-	-	6	-	462	68	6	600	2	602
CL-7(Ferry)	AZAM Ferry - Passengers		Inbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			outbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Detailed survey data at each survey points are saved in the attached CD.

## Result of Cordon Line Survey (Roadside OD Survey)

Result of OD by Mode, by Purpose are saved in the attached CD.



● Annex-4-2. Results of Screen Line Survey

Location Map



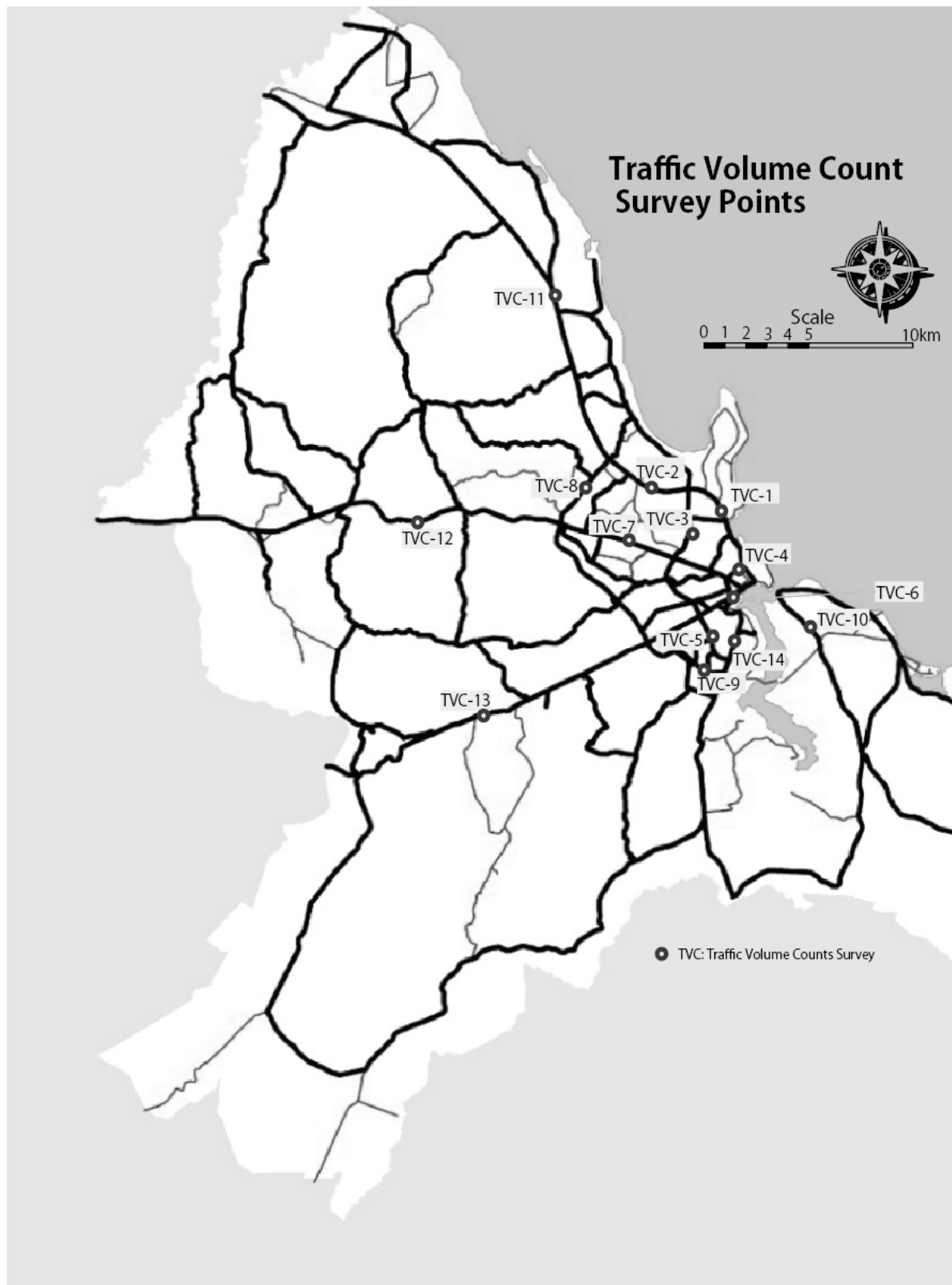
## Result of Screen Line Survey

No.	Survey Point	Road Name	Direction	Passenger Car	Taxi	Pick-up & Van	Microbus (Data-data)	Medium (Data-data)	Large bus	BRT	Organization Bus	2 Axle Truck (Light Truck)	3 Axle Truck (Dump Truck)	Heavy Truck	Motorcycle	Bhaji / Motor (3 Wheel)	Motorized Vehicle Total	NMT (Bicycle, Pushcart, etc)	Total
SL1-1	Mlalakawa (SL1-1)	Old Bagamoyo Rd	inbound	10,301	167	653	111	676	6	-	95	282	33	1	1,948	1,798	15,981	744	16,725
			outbound	7,835	194	656	115	659	-	-	130	360	5	1	1,474	1,261	12,700	989	13,289
			Total (24hr)	18,136	361	1,319	226	1,345	6	-	225	642	38	2	3,322	3,059	28,681	1,733	30,014
SL1-2	Makongo (SL1-2)	Bagamoyo Road	inbound	9,794	167	930	140	2,446	2	-	161	662	322	290	2,648	1,553	19,115	272	19,387
			outbound	9,910	80	395	171	2,281	-	-	204	543	733	258	2,099	1,128	17,802	205	18,007
			Total (24hr)	19,704	247	1,325	311	4,727	2	-	365	1,205	1,065	548	4,747	2,681	36,917	477	37,394
SL1-3	Kibo (SL1-3)	Morogoro Road	inbound	7,342	79	401	34	1,528	378	586	120	543	304	617	5,259	1,172	18,259	169	18,428
			outbound	5,357	106	1,024	447	1,528	278	520	82	468	110	889	3,589	711	15,209	134	15,343
			Total (24hr)	12,699	185	1,425	481	3,056	652	1,106	202	1,011	414	1,506	8,848	1,883	33,468	303	33,771
SL1-4	TAZARA SL(1-4)	Nyerere Road	inbound	8,721	329	479	186	2,169	5	-	90	619	520	964	6,067	406	20,605	1,262	21,867
			outbound	6,158	219	363	99	2,017	4	-	132	768	124	716	4,160	393	15,503	1,050	16,553
			Total (24hr)	14,929	548	872	285	4,186	9	-	222	1,417	644	1,680	10,227	799	36,108	2,312	38,460
SL1-5	Mbagala Misheni SL (1-5)	Kilwa Road	inbound	5,324	199	877	116	4,271	44	-	93	1,063	177	511	4,395	589	17,659	615	18,274
			outbound	5,900	131	983	183	4,347	44	-	64	635	184	514	4,708	661	18,354	678	19,032
			Total (24hr)	11,224	330	1,860	299	8,618	88	-	157	1,698	361	1,025	9,103	1,250	36,013	1,293	37,306
SL1-6	Surrender Bridge SL(2-6)	Ally Hassan Mwinyi Road	inbound	22,306	697	866	172	1,184	18	-	189	634	27	6	1,262	404	27,598	398	27,996
			outbound	22,763	697	1,003	164	977	18	-	302	641	28	2	2,252	349	29,196	464	29,660
			Total (24hr)	45,069	1,244	1,869	336	2,161	36	-	491	1,275	55	8	3,514	753	56,794	862	57,656
SL2-7	Jungwani (SL2-7)	Morogoro Road	inbound	26,305	879	1,146	181	1,077	3	-	215	707	70	20	1,600	519	31,836	426	32,262
			outbound	51,791	1,585	2,194	373	2,347	21	-	546	1,432	163	29	4,176	1,018	65,682	922	66,604
			Total (24hr)	78,096	2,464	3,340	554	3,424	24	-	761	2,139	133	49	5,776	1,537	97,518	1,348	98,866
SL2-8	Kigogo Sambusa (SL2-8)	Kawawa Road	inbound	6,809	155	366	49	4,607	23	-	100	1,217	793	327	4,678	886	20,010	853	20,863
			outbound	5,912	148	478	3	3,416	27	-	228	1,620	218	153	5,035	586	17,824	1,109	18,933
			Total (24hr)	12,721	303	844	52	8,023	50	-	328	2,837	1,011	283	10,113	1,472	37,834	1,962	39,796
SL2-9	SUKITA SL(2-9)	Mandala Road	inbound	2,866	47	253	40	2,052	18	-	36	533	293	985	5,592	933	13,648	905	14,553
			outbound	2,984	47	182	45	2,036	15	-	76	856	355	1,213	4,740	853	13,402	655	14,057
			Total (24hr)	5,850	94	435	85	4,088	33	-	112	1,389	648	2,198	10,332	1,786	27,050	1,560	28,610
SL3-10	Breweries SL(3-10)	Uhuru Road	inbound	2,663	185	176	82	2,799	3	-	9	608	21	16	1,922	260	8,344	2,013	10,359
			outbound	2,638	199	396	64	3,054	1	-	38	951	21	48	1,744	233	8,938	1,909	10,847
			Total (24hr)	4,901	384	572	146	5,853	4	-	47	1,159	23	64	3,636	493	17,282	3,924	21,206
SL3-11	Darajani Shoprite SL(3-11)	Nyerere Road	inbound	9,303	545	650	153	2,174	2	-	76	1,699	71	64	3,516	224	18,477	995	19,472
			outbound	9,564	556	733	116	2,659	7	-	201	1,009	356	63	3,218	175	18,657	1,389	20,046
			Total (24hr)	18,867	1,101	1,383	269	4,833	9	-	277	2,708	427	127	6,734	399	37,134	2,384	39,518
SL3-12	Railway Bridge (SL3-12)	Bandari Rd	inbound	10,823	634	794	205	2,632	4	-	80	1,805	98	92	4,020	266	21,453	1,039	22,492
			outbound	11,356	735	847	132	3,173	12	-	222	1,138	410	94	3,934	266	22,319	1,527	23,846
			Total (24hr)	22,179	1,369	1,641	337	5,805	16	-	302	2,943	508	186	7,954	532	43,772	2,566	46,338
SL3-13	Kigamboni Ferry SL (3-13)	Nyerere Road	inbound	7,942	384	496	48	2,348	1	-	105	514	28	19	4,459	193	16,537	594	17,131
			outbound	7,606	325	466	48	2,253	1	-	70	378	21	58	2,378	154	13,757	292	14,049
			Total (24hr)	15,548	709	962	96	4,601	1	-	175	892	49	77	6,837	347	30,294	886	31,180
SL3-14(T1)	AIRPORT-TML 1 (SL-14)	Nyerere Road	inbound	1,015	10	51	6	-	-	-	1	60	-	-	105	29	1,277	306	1,583
			outbound	2,150	67	126	18	4	-	-	9	140	-	-	327	92	2,934	972	3,906
			Total (24hr)	3,165	77	177	24	4	-	-	10	200	-	-	332	121	4,211	1,278	5,489
SL3-14(T2)	AIRPORT-TML 2 (SL-14)	Nyerere Road	inbound	612	80	44	4	-	-	-	48	4	8	2	45	5	850	12	862
			outbound	1,170	140	84	6	-	-	-	124	20	8	2	83	8	1,645	14	1,659
			Total (24hr)	1,782	220	128	10	-	-	-	172	24	16	4	128	13	2,495	26	2,521
SL3-15(G3)	TPA (SL-15)	Bandari Rd	inbound	2,187	228	81	-	-	-	-	75	17	-	-	20	2	2,610	5	2,615
			outbound	2,073	272	97	-	-	-	-	112	16	-	-	19	3	2,592	5	2,597
			Total (24hr)	4,260	500	178	-	-	-	-	187	33	-	-	39	5	5,202	10	5,212
SL3-15(G5)	TPA (SL-15)	Bandari Rd	inbound	2,765	374	121	24	8	-	-	131	16	-	-	21	3	3,494	6	3,500
			outbound	2,703	698	211	42	10	-	-	202	33	-	-	110	4	4,352	7	4,359
			Total (24hr)	5,703	1,072	332	66	18	-	-	333	49	-	-	221	7	7,846	13	7,859
SL3-16	Kigamboni Bridge (SL-16) /Mwalimu Nyerere Bridge	Kigamboni Road	inbound	2,766	19	239	105	166	1	-	8	181	21	139	977	104	4,736	250	4,976
			outbound	2,131	10	213	71	171	-	-	10	236	23	54	723	84	3,726	161	3,887
			Total (24hr)	4,897	29	452	176	337	1	-	18	417	44	193	1,700	188	8,462	411	8,863

Detailed survey data at each survey points are saved in the attached CD.

● Annex-4-3. Results of Traffic Volume Count Survey

Location Map



## Result of Traffic Volume Count Survey

No.	Survey Point	Road Name	Direction	Passenger Car	Taxi	Pick-up & Van	Microbus (Dala-dala)	Medium (Dala-dala)	Large bus	BRT	Organizational Bus	2 Axle Truck (Light Truck)	3 Axle Truck (Dump Truck)	Heavy Truck	Motorcycle	Bhaji/ (3 Wheels Motor Taxi)	Motorized Vehicle	Unit: vehicles	Total	
																				MNT (Bicycle, Pushcart, etc)
TVC-1	OSTERBAY (TVC-1)	ALI HASSAN MWINYI	Inbound	15,431	531	1,135	32	905	1	-	-	398	712	125	21	2,360	22,739	211	22,950	
			outbound	12,003	1,340	1,103	36	788	3	-	-	123	240	98	10	1,769	701	271	18,485	
			Total(14hr)	27,434	1,871	2,238	68	1,693	4	-	-	521	952	223	31	4,129	1,789	482	41,435	
TVC-2	MILLENIUM LAFI (TVC-2)	Bagamoyo Road	Inbound	12,025	126	590	81	2,959	-	-	-	146	494	97	28	2,675	20,697	266	20,963	
			outbound	14,649	169	811	139	2,696	4	-	-	121	518	60	46	2,648	17,300	281	23,872	
			Total(14hr)	26,674	295	1,401	220	5,655	4	-	-	267	1,012	157	74	5,323	3,206	44,288	547	44,835
TVC-3	MKWAJUNI (TVC-3)	Kawawa Road	Inbound	8,885	105	885	74	3,427	2	306	132	530	95	22	3,925	893	16,863	798	17,661	
			outbound	6,291	97	376	107	2,371	1	308	107	555	87	25	3,699	811	14,835	457	15,292	
			Total(14hr)	12,758	202	1,261	181	5,798	3	614	239	1,085	182	47	7,624	1,704	31,698	1,255	32,953	
TVC-4	MAKTABA (TVC-4)	Bibi Titi Road	Inbound	8,989	799	506	27	686	-	-	-	124	334	5	7	1,903	305	13,685	364	14,049
			outbound	7,890	589	537	65	385	2	-	-	92	257	74	35	1,619	128	11,673	285	11,958
			Total(14hr)	16,879	1,388	1,043	92	1,071	2	-	-	216	591	79	42	3,522	433	25,358	649	26,007
TVC-5	Chang'ombe (TVC-5)	Chang'ombe Road	Inbound	3,828	132	354	54	2,643	11	-	-	78	838	119	78	2,565	322	11,116	950	12,066
			outbound	7,750	232	987	111	5,179	14	-	-	157	1,655	256	232	5,172	609	22,374	1,660	24,034
			Total(14hr)	11,578	364	1,341	165	7,822	25	-	-	235	2,313	315	364	7,744	1,231	23,748	3,310	27,058
TVC-6	SOKOINE DRIVE (TVC-6)	Sokoine Drive	Inbound	6,827	383	500	42	878	-	-	-	92	327	14	2	2,596	141	11,802	373	12,175
			outbound	7,357	405	567	46	941	-	-	-	70	437	13	8	2,412	203	12,459	345	12,804
			Total(14hr)	14,184	788	1,067	88	1,819	-	-	-	162	764	27	10	5,008	344	24,261	718	24,979
TVC-7	MANZESE (TVC-7)	Morogoro Road	Inbound	7,294	228	517	100	2,121	46	840	113	919	163	92	4,317	1,218	17,968	1,319	19,287	
			outbound	6,310	330	550	89	1,772	29	979	66	556	236	114	4,698	1,381	17,110	1,298	18,408	
			Total(14hr)	13,604	558	1,067	189	3,893	75	1,819	179	1,475	399	206	9,015	2,599	35,078	2,617	37,695	
TVC-8	MILIMANI CIT (TVC-8)	Sam Nujoma Road	Inbound	8,198	115	573	43	1,998	26	-	-	222	762	171	250	2,966	1,535	16,859	35	16,894
			outbound	8,448	66	639	33	1,594	3	-	-	98	783	133	324	3,556	1,398	17,075	181	17,256
			Total(14hr)	16,646	181	1,212	76	3,592	29	-	-	320	1,545	304	574	6,522	2,933	33,934	216	34,150
TVC-9	SERENGETI (TVC-9)	Nelson Mandela Road	Inbound	2,768	35	365	34	401	8	-	-	41	265	111	1,389	1,865	256	7,538	261	7,799
			outbound	2,675	49	542	50	382	3	-	-	32	468	122	1,248	2,475	354	8,400	476	8,876
			Total(14hr)	5,443	84	907	84	783	11	-	-	73	733	233	2,637	4,340	610	15,938	737	16,675
TVC-10	KIGAMBONI (TVC-10)	Kigamboni	Inbound	1,465	3	112	636	401	6	-	-	52	140	8	-	3,427	3,286	9,536	633	10,169
			outbound	1,752	11	151	214	227	-	-	-	24	124	8	3	3,845	4,317	10,676	705	11,381
			Total(14hr)	3,217	14	263	850	628	6	-	-	76	264	16	3	7,272	7,603	20,212	1,338	21,550
TVC-11	TEGETA (TVC-11)	Bagamoyo Road	Inbound	5,976	17	492	92	1,863	1	-	-	199	872	176	176	2,325	995	13,184	149	13,333
			outbound	7,289	25	629	73	1,902	2	-	-	103	889	237	136	2,959	1,217	15,461	159	15,620
			Total(14hr)	13,265	42	1,121	165	3,765	3	-	-	302	1,761	413	312	5,284	2,212	28,645	308	28,953
TVC-12	Mbzi (MKA) (TVC-12)	Morogoro Road	Inbound	4,980	17	344	34	1,752	249	224	187	433	670	782	3,042	705	13,419	49	13,468	
			outbound	3,683	11	641	48	1,491	334	200	201	1,007	86	719	3,018	549	11,988	95	12,083	
			Total(14hr)	8,663	28	985	82	3,243	583	424	388	1,440	756	1,501	6,060	1,254	25,407	144	25,551	
TVC-13	UKONGA (TVC-13)	Nyerere Road	Inbound	3,585	72	203	61	2,590	1	-	-	80	552	108	81	3,318	322	10,973	284	11,257
			outbound	3,671	40	247	43	2,467	4	-	-	63	559	99	75	2,627	245	10,140	466	10,606
			Total(14hr)	7,256	112	450	104	5,057	5	-	-	143	1,111	207	156	5,945	567	21,113	750	21,863
TVC-14	MIVINIENI (TVC-14)	Kilwa Road	Inbound	6,635	342	533	81	2,277	-	-	-	74	344	176	379	2,798	198	13,837	452	14,289
			outbound	6,799	427	392	46	2,015	9	-	-	101	362	197	326	2,315	175	13,164	207	13,371
			Total(14hr)	13,434	769	925	127	4,292	9	-	-	175	706	373	705	5,113	373	27,001	659	27,660

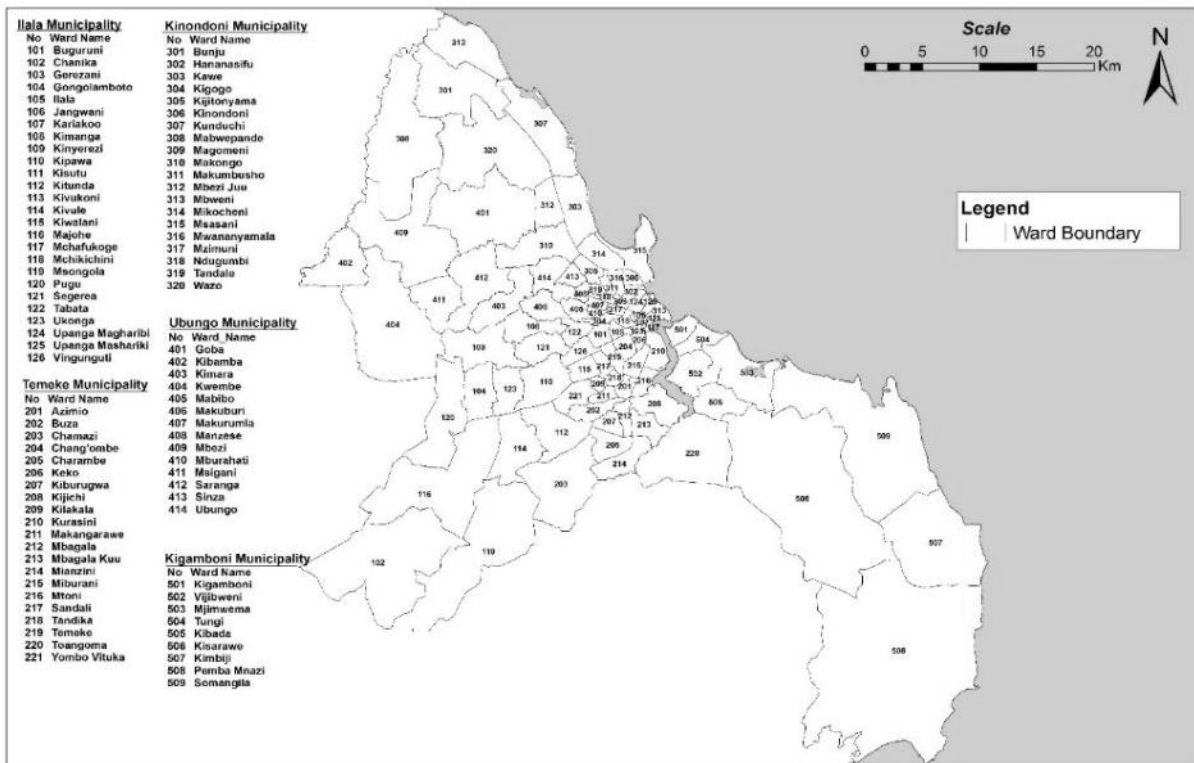
Detailed survey data at each survey points are saved in the attached CD.

Annex-4-4. Zone Code Table for OD survey

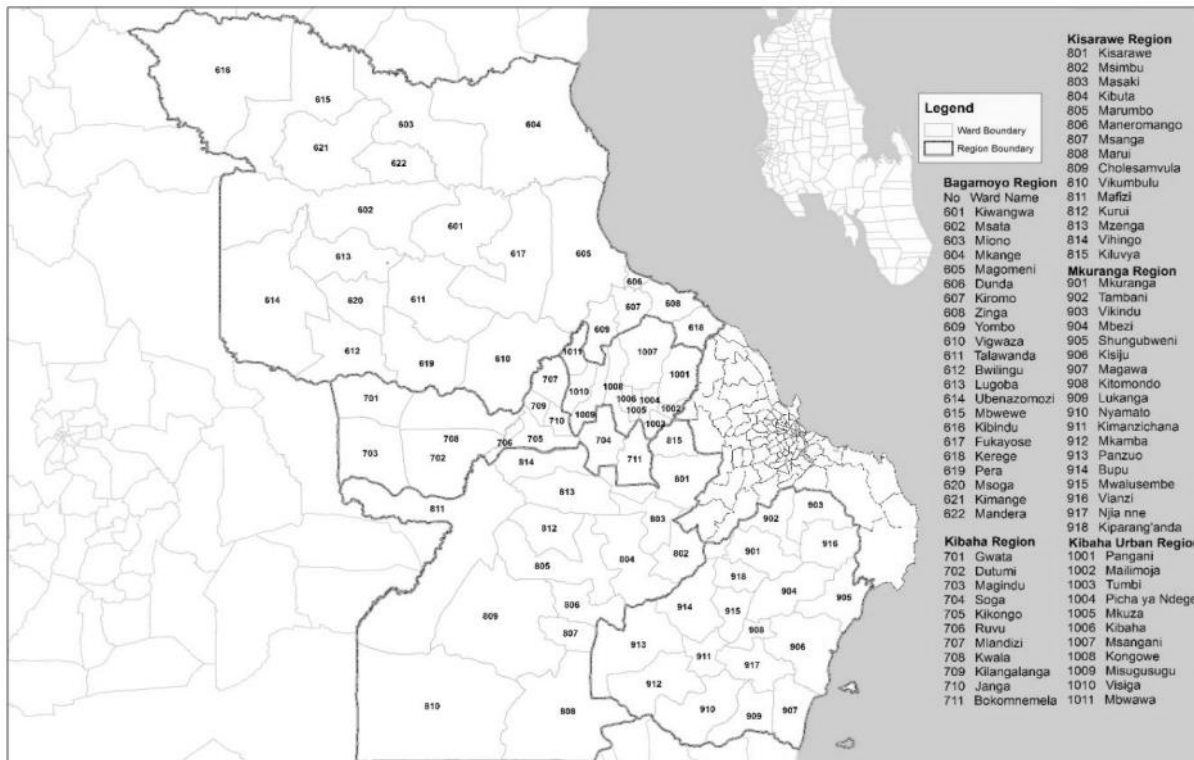
Dar es Salaam						
Ilala(26)	101	Buguruni	Kinondoni(20)	301	Bunju	
	102	Chanika		302	Hanasif	
	103	Gerezani		303	Kawe	
	104	Gongo la Mboto		304	Kigogo	
	105	Ilala		305	Kijitonyama	
	106	Jangwani		306	Kinondoni	
	107	Kariakoo		307	Kunduchi	
	108	Kimanga		308	Mabwepande	
	109	Kinyerezi		309	Magomeni	
	110	Kipawa		310	Makongo	
	111	Kisutu		311	Makumbusho	
	112	Kitunda		312	Mbezi juu	
	113	Kivukoni		313	Mbweni	
	114	Kivule		314	Mikocheni	
	115	Kiwalani		315	Msasani	
	116	Majohe		316	Mwananyamala	
	117	Mchafukoge		317	Mzimuni	
	118	Mchikichini		318	Ndugumbi	
	119	Msongola		319	Tandale	
	120	Pugu		320	Wazo	
	121	Segerea	Ubungo(14)	401	Goba	
	122	Tabata		402	Kibamba	
	123	Ukonga		403	Kimara	
	124	Upanga Magharibi		404	Kwembe	
	125	Upanga Mashariki		405	Mabibo	
	126	Vingunguti		406	Makuburi	
Temeke(21)	201	Azimio		407	Makurumla	
	202	Buza		408	Manzese	
	203	Chamazi		409	Mbezi	
	204	Chang'ombe		410	Mburahati	
	205	Charambe		411	Msigani	
	206	Keko		412	Saranga	
	207	Kiburugwa		413	Sinza	
	208	Kijichi		414	Ubungo	
	209	Kilakala		Kigamboni(9)	501	Kigamboni
	210	Kurasini			502	Vijibweni
	211	Makangarawe			503	Mjimwema
	212	Mbagala			504	Tungi
	213	Mbagala Kuu			505	Kibada
	214	Mianzini			506	Kisarawe II
	215	Miburani	507		Kimbiji	
216	Mtoni	508	Pembamnazi			
217	Sandali	509	Somangila			
218	Tandika					
219	Temeke					
220	Toangoma					
221	Yombo Vituka					

Outside of Dar es Salaam						
Bagamoyo	601	Kiwangwa	Mkrunga	901	Mkuranga	
	602	Msata		902	Tambani	
	603	Miono		903	Vikindu	
	604	Mkange		904	Mbezi	
	605	Magomeni		905	Shungubweni	
	606	Dunda		906	Kisiju	
	607	Kiromo		907	Magawa	
	608	Zinga		908	Kitomondo	
	609	Yombo		909	Lukanga	
	610	Vigwaza		910	Nyamato	
	611	Talawanda		911	Kimanzichana	
	612	Bwilingu		912	Mkamba	
	613	Lugoba		913	Panzuo	
	614	Ubenazomozi		914	Bupu	
	615	Mbwewe		915	Mwalusembe	
	616	Kibindu		916	Vianzi	
	617	Fukayose		917	Njia Nne	
	Kibaha	618	Kerege	Kibaha Urban	1001	Pangani
		619	Pera		1002	Maili Moja
		620	Msoga		1003	Tumbi
		621	Kimange		1004	Picha ya Ndege
		622	Mandera		1005	Mkuza
701		Gwata	1006		Kibaha	
702		Dutumi	1007		Msangani	
703		Magindu	1008		Kongowe	
704		Soga	1009		Misugusugu	
705		Kikongo	1010		Visiga	
706		Ruvu	1011		Mbwawa	
Kisarawe	707	Mlandizi	<b>Other Tanzania Region</b>			
	708	Kwala	2001	Tanga		
	709	Kilangalanga	2002	Morogoro		
	710	Janga	2003	Lindi		
	711	Bokomnemela	2004	Mtwara		
	801	Kisarawe	2005	Ruvuma		
	802	Msimbu	2006	Njombe		
	803	Masaki	2007	Iringa		
	804	Kibuta	2008	Dodoma		
	805	Marumbo	2009	Manyara		
	806	Maneromango	2010	Kilimanjaro		
807	Msanga	2011	Arusha			
808	Marui	2012	Mara			
809	Cholesamvula	2013	Simiyu			
810	Vikumbulu	2014	Singida			
811	Mafizi	2015	Mbeya			
812	Kurui	2016	Tabora			
813	Mzenga	2017	Shinyanga			
814	Vihingo	2018	Mwanza			
815	Kiluvya	2019	Geita			
			2020	Kagera		
			2021	Kigoma		
			2022	Katavi		
			2023	Rukwa		
			<b>Outside of Tanzania</b>			
			3000	Kenya		
			3100	Uganda		
			3200	Rwanda		
			3300	Burundi		
			3400	DR Congo		
			3500	Zambia		
		3600	Malawi			
		3700	Mozambique			

● Annex-4-5. Zone Code Map



Zone Code Map (DSM)



Zone Code Map (Outside of DSM)

● Annex-4-6. Number of Samples and Expansion Factor for Household Interview Survey (Ward)

Zone			Number of Sample		2012 Census		2017 Estimated		Sampling rate (Household)		Expansion Factor (2017 Population)
			No. of household	No. of Population	No. of household	No. of Population	No. of household	No. of Population	Sample/2012	Sample/2017	
			[Unit:Household]	[Unit:person]	[Unit:Household]	[Unit:person]	[Unit:Household]	[Unit:person]	[Unit: %]	[Unit: %]	-
No.	Municipal	Ward	a1	a2	b1	b1	c1	c2	a1/b1	a1/c1	EF=b2/a2
101	Ilaia	Buguruni	400	1,939	18,575	70,585	19,752	75,059	2.2	2.0	39
102		Chanika	236	1,138	10,978	43,912	14,112	56,447	2.1	1.7	50
103		Gerezani	45	229	1,654	7,276	1,973	8,682	2.7	2.3	38
104		Gongolamboto	299	1,440	14,328	57,312	20,436	81,742	2.1	1.5	57
105		Ilaia	154	818	7,229	31,083	7,165	30,809	2.1	2.1	38
106		Janzwani	91	459	4,202	17,647	4,646	19,513	2.2	2.0	43
107		Kariakoo	90	398	3,205	13,780	4,093	17,599	2.8	2.2	44
108		Kimanga	409	1,922	19,180	78,557	26,923	110,383	2.1	1.5	57
109		Kinyerezi	196	952	8,720	38,366	14,336	63,053	2.2	1.4	66
110		Kipawa	383	1,783	18,545	74,180	23,521	94,084	2.1	1.6	53
111		Kisutu	50	208	2,245	8,308	2,687	9,941	2.2	1.9	48
112		Kitunda	282	1,330	12,985	57,132	20,610	90,682	2.2	1.4	68
113	Kivukoni	40	186	1,686	6,742	2,159	8,638	2.4	1.9	46	
114	Kivule	328	1,600	16,371	72,032	26,983	118,724	2.0	1.2	74	
115	Kiwilani	451	2,078	22,241	82,292	26,813	99,209	2.0	1.7	48	
116	Majehe	585	2,816	19,440	81,646	33,971	142,679	3.0	1.7	51	
117	Mchafukoze	61	280	2,741	10,688	3,445	13,437	2.2	1.8	48	
118	Mchikichini	178	881	6,541	25,510	7,846	30,598	2.7	2.3	35	
119	Msongola	126	616	5,689	24,461	9,130	39,260	2.2	1.4	64	
120	Pugu	242	1,161	11,767	49,422	17,895	75,161	2.1	1.4	65	
121	Segerea	417	1,958	19,376	83,315	27,145	116,724	2.2	1.5	60	
122	Tabata	430	1,922	19,669	74,742	25,650	97,468	2.2	1.7	51	
123	Ukongea	400	1,935	19,520	80,034	20,422	83,728	2.0	2.0	43	
124	Upanga Mashariki	70	294	3,369	13,476	4,224	16,896	2.1	1.7	57	
125	Upanga Mashariki	60	273	2,792	11,167	3,550	14,201	2.1	1.7	52	
126	Vingunguti	581	2,572	28,904	106,946	37,157	137,481	2.0	1.6	53	
Ilaia Total			6,604	31,188	301,929	1,220,611	408,685	1,652,198	2.2	1.6	53
201	Temeke	Azimio	419	1,997	20,765	76,832	24,388	90,236	2.0	1.7	45
202		Buza	286	1,386	13,435	55,082	20,806	85,305	2.1	1.4	62
203		Chamazi	312	1,560	15,155	63,650	25,124	105,523	2.1	1.2	68
204		Chang'ombe	100	530	4,826	19,302	4,927	19,707	2.1	2.0	37
205		Charambe	514	2,440	25,483	101,933	38,343	153,371	2.0	1.3	63
206		Keko	190	977	9,253	35,163	10,057	38,217	2.1	1.9	39
207		Kiburujwa	430	2,073	20,766	78,911	30,028	114,106	2.1	1.4	55
208		Kijichi	345	1,784	16,877	69,195	24,144	98,991	2.0	1.4	55
209		Kilakala	257	1,245	12,148	44,949	16,432	60,799	2.1	1.6	49
210		Kurasini	140	715	6,893	26,193	5,971	22,691	2.0	2.3	32
211		Makanarawe	286	1,659	13,664	53,291	18,949	73,900	2.1	1.5	45
212		Mbagala	285	1,389	13,837	52,582	17,200	65,361	2.1	1.7	47
213		Mbagala Kuu	396	1,937	19,173	74,774	26,328	102,681	2.1	1.5	53
214		Mianzini	509	2,516	25,182	100,649	35,281	141,123	2.0	1.4	56
215		Miburani	231	1,160	11,073	44,290	12,176	48,705	2.1	1.9	42
216		Mtoni	330	1,300	16,048	59,378	18,719	69,261	2.1	1.8	53
217	Sandali	280	1,271	13,858	52,660	15,759	59,886	2.0	1.8	44	
218	Tandika	272	1,286	13,376	49,491	15,225	56,334	2.0	1.8	44	
219	Temeke	140	643	6,679	26,047	6,591	25,703	2.1	2.1	40	
220	Toangoma	211	1,105	10,367	44,578	15,865	68,221	2.0	1.3	62	
221	Yombo Vituka	391	1,904	19,250	76,999	26,601	106,405	2.0	1.5	56	
Temeke Total			6,324	30,877	308,088	1,205,949	410,425	1,606,526	2.1	1.5	52
301	Kinondoni	Bunju	301	1,448	14,692	60,236	22,537	92,403	2.0	1.3	64
302		Hananasifu	220	1,033	10,031	37,115	11,299	41,805	2.2	1.9	40
303		Kawe	360	1,646	16,779	67,115	21,435	85,742	2.1	1.7	52
304		Kigogo	300	1,476	14,773	57,613	18,826	73,421	2.0	1.6	50
305		Kijitonyama	300	1,357	14,906	58,132	16,402	63,970	2.0	1.8	47
306		Kinondoni	120	604	5,589	21,239	5,689	21,619	2.1	2.1	36
307		Kunduchi	378	1,789	17,861	75,016	22,946	96,371	2.1	1.6	54
308		Mabwepande	143	619	6,700	25,460	11,255	42,769	2.1	1.3	69
309		Majomeni	157	864	6,421	24,400	6,932	26,342	2.4	2.3	30
310		Makonjo	211	968	10,185	43,796	13,015	55,964	2.1	1.6	58
311		Makumbusho	380	1,548	18,404	68,093	21,333	78,931	2.1	1.8	51
312		Mbezi juu	199	957	9,843	41,340	14,020	58,884	2.0	1.4	62
313		Mbweni	70	285	3,278	13,766	5,236	21,990	2.1	1.3	77
314		Mikocheni	170	776	8,237	32,947	9,487	37,948	2.1	1.8	49
315		Msasani	260	1,141	12,544	48,920	13,896	54,194	2.1	1.9	47
316		Mwananyamala	280	1,230	13,685	50,560	15,275	56,517	2.0	1.8	46
317	Mzimuni	156	808	5,240	21,486	4,891	20,052	3.0	3.2	25	
318	Ndugumbi	200	979	9,957	36,841	10,111	37,409	2.0	2.0	38	
319	Tandale	333	1,671	15,217	54,781	15,544	55,957	2.2	2.1	33	
320	Wazo	462	2,014	22,706	90,825	35,654	142,615	2.0	1.3	71	
Kinondoni Total			5,000	23,213	237,026	929,681	296,996	1,164,901	2.1	1.7	50
401	Ubungo	Goba	236	1,062	10,159	42,669	16,351	68,675	2.3	1.4	65
402		Kibamba	140	587	6,877	28,885	9,684	40,671	2.0	1.4	69
403		Kimara	388	1,783	18,677	76,577	28,446	116,630	2.1	1.4	65
404		Kwembe	284	1,350	13,878	56,899	23,562	96,604	2.0	1.2	72
405		Mabibo	484	2,318	21,983	85,735	24,763	96,577	2.2	2.0	42
406		Makuburi	312	1,383	15,107	57,408	20,022	76,084	2.1	1.6	55
407		Makurumfa	399	2,079	16,672	63,352	18,102	68,787	2.4	2.2	33
408		Manzese	416	1,856	19,056	70,507	20,291	75,076	2.2	2.1	40
409		Mbezi	353	1,511	17,480	73,414	26,660	111,974	2.0	1.3	74
410		Mburahati	182	887	8,749	34,123	11,309	44,105	2.1	1.6	50
411		Msigani	261	1,078	12,817	55,111	20,832	89,576	2.0	1.3	83
412	Saranga	508	2,336	24,792	104,127	34,070	143,095	2.0	1.5	61	
413	Sinza	213	906	9,889	40,546	9,392	38,506	2.2	2.3	43	
414	Ubungo	361	1,658	14,741	56,015	16,780	63,766	2.4	2.2	38	
Ubungo Total			4,537	20,794	210,878	845,368	281,910	1,130,124	2.2	1.6	54
501	Kigamboni	Kigamboni	162	789	7,624	30,496	10,652	42,607	2.1	1.5	54
502		Vijibweni	150	752	7,076	29,010	11,486	47,094	2.1	1.3	63
503		Mijimwema	159	756	6,947	27,789	10,532	42,126	2.3	1.5	56
504		Tunzi	121	657	5,567	23,380	6,526	27,407	2.2	1.9	42
505		Kibada	50	259	2,094	8,585	3,084	12,645	2.4	1.6	49
506		Kisarawe II	50	251	2,130	8,306	2,938	11,457	2.3	1.7	46
507		Kimbi	40	232	1,584	6,411	2,092	8,578	2.6	1.9	37
508		Pemba mnazi	50	260	2,359	9,672	3,228	13,233	2.1	1.5	51
509	Somanjila	98	519	4,703	19,283	5,527	22,660	2.1	1.8	44	
Kigamboni Total			880	4,475	40,063	162,932	56,015	227,808	2.2	1.6	51
Dar es Salaam Total			23,345	110,647	1,097,983	4,364,541	1,454,461	5,781,557	2.1	1.6	52

Source: JST

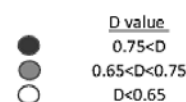


● Annex 4-7: Trip Distance Distribution by Transport Mode

			Distance									
			0.0-1.0	1.0-5.0	5.0-10.0	10.0-15.0	15.0-20.0	20.0-30.0	30.0-40.0	40.0-50.0	60-	All
Mode	NMT	Walking	84.7%	68.3%	11.5%	6.2%	4.4%	2.2%	0.7%	2.2%	0.2%	39.0%
		Bicycle	0.4%	0.6%	0.6%	0.4%	0.2%	0.3%	0.3%	0.0%	0.0%	0.5%
	Sub Total	85.1%	68.9%	12.0%	6.6%	4.6%	2.5%	1.0%	2.2%	0.2%	39.5%	
	Private Mode	Car	1.3%	1.8%	4.2%	4.5%	5.1%	6.9%	5.6%	5.0%	7.4%	4.9%
		M/C	2.1%	5.4%	4.7%	4.1%	3.9%	3.6%	1.7%	3.5%	5.2%	3.7%
	Sub Total	3.3%	7.2%	8.9%	8.6%	9.0%	10.4%	7.3%	8.5%	12.5%	8.6%	
	Public Mode	Bus	11.3%	23.3%	74.6%	80.3%	77.0%	78.8%	87.0%	89.1%	85.1%	47.9%
		BRT	0.3%	0.6%	4.2%	3.8%	8.4%	7.5%	2.8%	0.2%	1.7%	3.3%
		Railway	0.0%	0.0%	0.3%	0.6%	1.0%	0.6%	1.9%	0.0%	0.4%	0.4%
	Sub Total	11.6%	23.9%	79.1%	84.7%	86.4%	87.0%	91.7%	89.3%	87.3%	51.6%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
			Mode									
			NMT		Sub Total	Private Mode		Sub Total	Public Mode			Sub Total
Walking	Bicycle	Car	M/C	Bus		BRT	Railway					
Distance	0.0-1.0	13.9%	5.0%	13.8%	2.2%	2.7%	2.5%	1.3%	0.5%	0.0%	1.2%	5.9%
	1.0-5.0	75.5%	49.7%	75.2%	20.6%	47.3%	35.7%	17.5%	7.7%	3.9%	16.9%	39.5%
	5.0-10.0	6.1%	22.1%	6.3%	23.0%	20.0%	21.3%	27.0%	26.2%	16.4%	26.9%	19.0%
	10.0-15.0	2.8%	13.2%	3.0%	21.3%	14.9%	17.6%	24.8%	20.4%	27.7%	24.6%	16.2%
	15.0-20.0	1.1%	3.3%	1.1%	13.0%	7.7%	10.0%	13.0%	24.5%	25.1%	13.7%	8.8%
	20.0-30.0	0.4%	5.2%	0.5%	14.5%	5.7%	9.5%	10.9%	18.1%	12.7%	11.3%	7.2%
	30.0-40.0	0.1%	1.4%	0.1%	4.4%	1.0%	2.5%	4.5%	2.5%	13.9%	4.5%	2.7%
	40.0-50.0	0.0%	0.0%	0.0%	0.5%	0.3%	0.4%	0.6%	0.0%	0.0%	0.6%	0.4%
	60-	0.0%	0.0%	0.0%	0.6%	0.3%	0.4%	0.4%	0.1%	0.3%	0.4%	0.3%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: JST

● Annex 4-8: D-value on Radial Roads and Ring Roads



D value on Radial Roads

Morning Peak

Location	Traffic Volume(pcu/h)			D value	Peak Hour
	inbound	outbound	total		
CL-1	183.5	278.5	462.0	○	0.60 9:00-10:00
CL-2	257.5	635.5	893.0	●	0.71 6:00-7:00
CL-3	52.0	157.0	209.0	●	0.75 7:00-8:00
CL-4	283.8	417.8	701.5	○	0.60 7:00-8:00
CL-5	534.3	195.8	730.0	●	0.73 6:00-7:00
SL1-1	2,096.5	373.3	2,469.8	●	0.85 7:00-8:00
SL1-2	2,574.5	1,135.8	3,710.3	●	0.69 6:00-7:00
SL1-3	2,503.0	960.0	3,463.0	●	0.72 7:00-8:00
SL1-4	2,373.5	993.8	3,367.3	●	0.70 6:00-7:00
SL1-5	2,569.3	1,187.8	3,757.0	●	0.68 7:00-8:00
SL2-6	2,416.8	1,178.0	3,594.8	●	0.67 6:00-7:00
SL2-7	1,552.3	513.0	2,065.3	●	0.75 6:00-7:00
SL3-11	1,677.3	1,207.8	2,885.0	○	0.58 6:00-7:00
TVC-1	2,214.0	899.3	3,113.3	○	0.71 6:00-7:00
TVC-2	2,350.3	1,076.0	3,426.3	●	0.69 6:00-7:00
TVC-7	1,501.5	778.8	2,280.3	●	0.66 6:00-7:00
TVC-11	1,430.3	766.8	2,197.0	○	0.65 6:00-7:00
TVC-12	1,339.5	888.8	2,228.3	○	0.60 8:00-9:00
TVC-13	1,368.5	629.3	1,997.8	●	0.69 7:00-8:00
TVC-14	2,521.5	354.3	2,875.8	●	0.88 7:00-8:00

Evening Peak

Location	Traffic Volume(pcu/h)			D value	Peak Hour
	inbound	outbound	total		
CL-1	461.5	267.3	728.8	○	0.63 19:00-20:00
CL-2	875.0	511.3	1,386.3	○	0.63 14:00-15:00
CL-3	129.0	71.3	200.3	○	0.64 15:00-16:00
CL-4	295.0	426.3	721.3	○	0.59 14:00-15:00
CL-5	429.0	587.8	1,016.8	○	0.58 18:00-19:00
SL1-1	602.8	1,441.0	2,043.8	●	0.71 17:00-18:00
SL1-2	959.8	2,198.8	3,158.5	●	0.70 19:00-20:00
SL1-3	1,111.3	1,824.3	2,935.5	○	0.62 16:00-17:00
SL1-4	1,812.5	1,305.0	3,117.5	○	0.58 12:00-13:00
SL1-5	1,149.5	2,272.8	3,422.3	●	0.66 19:00-20:00
SL2-6	1,295.5	2,870.8	4,166.3	●	0.69 17:00-18:00
SL2-7	774.3	1,520.0	2,294.3	●	0.66 18:00-19:00
SL3-11	436.0	775.0	1,211.0	○	0.64 21:00-22:00
TVC-1	2,066.3	1,165.8	3,232.0	○	0.64 14:00-15:00
TVC-2	1,085.0	2,592.5	3,677.5	●	0.70 18:00-19:00
TVC-7	1,159.5	1,903.3	3,062.8	○	0.62 19:00-20:00
TVC-11	1,014.8	1,600.3	2,615.0	○	0.61 19:00-20:00
TVC-12	1,723.3	1,271.8	2,995.0	○	0.58 19:00-20:00
TVC-13	966.0	1,588.8	2,554.8	○	0.62 17:00-18:00
TVC-14	776.0	2,489.8	3,265.8	●	0.76 17:00-18:00

D Value on Ring Roads

Morning Peak

Location	Traffic Volume(pcu/h)			D value	Peak Hour
	inbound	outbound	total		
SL2-8	1,910.0	1,251.0	3,161.0	○	0.60 9:00-10:00
SL2-9	1,424.0	1,086.3	2,510.3	○	0.57 6:00-7:00
SL3-10	1,033.3	685.0	1,718.3	○	0.60 6:00-7:00
SL3-12	1,931.5	596.5	2,528.0	●	0.76 7:00-8:00
SL-16	844.0	289.0	1,133.0	●	0.74 7:00-8:00
TVC-3	1,636.3	1,118.5	2,754.8	○	0.59 11:00-12:00
TVC-4	1,480.8	801.5	2,282.3	○	0.65 7:00-8:00
TVC-5	1,146.8	831.5	1,978.3	○	0.58 6:00-7:00
TVC-6	1,827.5	190.8	2,018.3	●	0.91 7:00-8:00
TVC-8	1,468.3	2,700.8	4,169.0	○	0.65 8:00-9:00
TVC-9	752.8	407.3	1,160.0	○	0.65 6:00-7:00
TVC-10	612.3	446.3	1,058.5	○	0.58 9:00-10:00

Evening Peak

Location	Traffic Volume(pcu/h)			D value	Peak Hour
	inbound	outbound	total		
SL2-8	2,511.5	1,652.3	4,163.8	○	0.60 16:00-17:00
SL2-9	997.5	1,545.8	2,543.3	○	0.61 17:00-18:00
SL3-10	642.5	986.5	1,629.0	○	0.61 16:00-17:00
SL3-12	654.0	1,742.8	2,396.8	●	0.73 18:00-19:00
SL-16	222.5	445.3	667.8	●	0.67 19:00-20:00
TVC-3	1,522.0	1,036.3	2,558.3	○	0.59 18:00-19:00
TVC-4	714.0	498.8	1,212.8	○	0.59 19:00-20:00
TVC-5	857.3	1,154.5	2,011.8	○	0.57 19:00-20:00
TVC-6	382.8	1,467.8	1,850.5	●	0.79 18:00-19:00
TVC-8	2,173.0	1,170.5	3,343.5	○	0.65 14:00-15:00
TVC-9	553.5	986.8	1,540.3	○	0.64 17:00-18:00
TVC-10	532.8	971.3	1,504.0	○	0.65 16:00-17:00

Source: JST

● Annex 4-9: OD Interview Result

Location	Direction	Type of Vehicle(1)	Type of Vehicle(2)	Number of Samples		Number of Traffic Counted (24H adjusted)		Sample Ratio (%)	Expansion Factor	
				(Vehicle/day)	(Vehicle/day)	(Vehicle/day)	(Vehicle/day)			
BUNJU (CL-1)	Inbound	Motorcycle	M/C	29	39	1807	1870	2.1%	48	
		Bike Taxi		1		0				
		Bajaji		9		63				
		Passenger car	Car	223	247	1558	1760	14.0%	7	
		Pick-up/Van		24		194				
		Taxi		0		8				
		Micro bus(Daladala)	Bus	7	65	28	534	12.2%	8	
		Medium/Small daladala		53		446				
		Large bus		0		1				
		School Bus	Truck	5	132	59	576	22.9%	4	
		2 Axles Truck		104		331				
		3 Axles truck		13		113				
		Heavy truck	BRT	15	0	133	0	0	0	0
		BRT		0		0				
		Ferry		0		0				
	Railway	Railway	0	0	0	0	0	0	0	
	Walking	Other	0	0	0	0	0	0	0	
	Bicycle		0		104					
	Other		0		0					
	Outbound	M/C	Motorcycle	18	28	1661	1711	1.6%	61	
			Bike Taxi	5		0				
			Bajaji	5		49				
		Passenger car	Car	160	173	1606	1827	9.5%	11	
		Pick-up/Van		13		216				
		Taxi		0		5				
		Micro bus(Daladala)	Bus	1	66	18	438	15.1%	7	
		Medium/Small daladala		57		371				
		Large bus		0		5				
		School Bus	Truck	8	88	45	476	18.5%	5	
		2 Axles Truck		70		309				
3 Axles truck		14		65						
Heavy truck		BRT	4	0	102	0	0	0	0	
BRT			0		0					
Ferry			0		0					
Railway	Railway	0	0	0	0	0	0	0		
Walking	Other	0	0	0	0	0	0	0		
Bicycle		0		174						
Other		1		0						

Location	Direction	Type of Vehicle(1)	Type of Vehicle(2)	Number of Samples		Number of Traffic Counted (24H adjusted)		Sample Ratio (%)	Expansion Factor	
				(Vehicle/day)	(Vehicle/day)	(Vehicle/day)	(Vehicle/day)			
KIBAHA (CL-2)	Inbound	Motorcycle	M/C	7	11	1257	1301	0.8%	118	
		Bike Taxi		3		0				
		Bajaji		1		43				
		Passenger car	Car	150	155	2744	3075	5.0%	20	
		Pick-up/Van		4		330				
		Taxi		1		1				
		Micro bus(Daladala)	Bus	7	133	261	1572	8.5%	12	
		Medium/Small daladala		61		912				
		Large bus		64		386				
		School Bus	Truck	1	202	13	1990	10.2%	10	
		2 Axles Truck		51		1044				
		3 Axles truck		53		148				
		Heavy truck	BRT	98	0	798	0	0	0	0
		BRT		0		0				
		Ferry		0		0				
	Railway	Railway	0	0	0	0	0	0	0	
	Walking	Other	0	0	0	0	0	0	0	
	Bicycle		0		72					
	Other		0		0					
	Outbound	M/C	Motorcycle	4	9	844	879	1.0%	98	
			Bike Taxi	3		0				
			Bajaji	2		35				
		Passenger car	Car	153	180	1988	2250	8.0%	12	
		Pick-up/Van		26		256				
		Taxi		1		6				
		Micro bus(Daladala)	Bus	13	150	154	1389	10.8%	9	
		Medium/Small daladala		68		775				
		Large bus		65		390				
		School Bus	Truck	4	231	70	1849	12.5%	8	
		2 Axles Truck		118		861				
3 Axles truck		56		86						
Heavy truck		BRT	57	0	903	0	0	0	0	
BRT			0		0					
Ferry			0		0					
Railway	Railway	0	0	0	0	0	0	0		
Walking	Other	0	0	0	0	0	0	0		
Bicycle		0		42						
Other		0		0						

Source: JST

Location	Direction	Type of Vehicle(1)	Type of Vehicle(2)	Number of Samples		Number of Traffic Counted (24H adjusted)		Sample Ratio (%)	Expansion Factor	
				(Vehicle/day)		(Vehicle/day)				
KISARAWA (CL-3)	Inbound	Motorcycle	M/C	21	30	321	337	8.9%	11	
		Bike Taxi		0		0				
		Bajaji		9		16				
		Passenger car	Car	197	202	358	404	50.0%	2	
		Pick-up/Van		5		45				
		Taxi		0		1				
		Micro bus(Daladala)	Bus	6	45	56	177	25.4%	4	
		Medium/Small daladala		11		107				
		Large bus		26		5				
		School Bus		2		9				
		2 Axles Truck	Truck	45	65	133	251	25.9%	4	
		3 Axles truck		7		62				
		Heavy truck		13		56				
		BRT	BRT	0		0				
		Ferry	Ferry	0		0				
	Railway	Railway	0		0					
	Walking		0		0					
	Bicycle		0		16					
	Other		2		0					
	Outbound	Motorcycle	M/C	6	11	358	377	2.9%	34	
		Bike Taxi		0		0				
		Bajaji		5		19				
		Passenger car	Car	60	76	397	438	17.4%	6	
		Pick-up/Van		15		39				
		Taxi		1		2				
		Micro bus(Daladala)	Bus	7	29	56	157	18.4%	5	
		Medium/Small daladala		14		86				
		Large bus		7		8				
		School Bus		1		7				
		2 Axles Truck	Truck	21	47	79	258	18.2%	5	
3 Axles truck		8		156						
Heavy truck		18		23						
BRT		BRT	0		0					
Ferry		Ferry	0		0					
Railway	Railway	0		0						
Walking		0		0						
Bicycle		0		20						
Other		3		0						
Location	Direction	Type of Vehicle(1)	Type of Vehicle(2)	Number of Samples		Number of Traffic Counted (24H adjusted)		Sample Ratio (%)	Expansion Factor	
				(Vehicle/day)		(Vehicle/day)				
MKURANGA (CL-4)	Inbound	Motorcycle	M/C	67	74	1922	2009	3.7%	27	
		Bike Taxi		1		0				
		Bajaji		6		87				
		Passenger car	Car	127	135	1248	1394	9.7%	10	
		Pick-up/Van		6		134				
		Taxi		2		12				
		Micro bus(Daladala)	Bus	104	261	598	1472	17.7%	6	
		Medium/Small daladala		145		754				
		Large bus		6		67				
		School Bus		6		54				
		2 Axles Truck	Truck	69	105	477	742	14.2%	7	
		3 Axles truck		15		72				
		Heavy truck		21		194				
		BRT	BRT	0		0				
		Ferry	Ferry	0		0				
	Railway	Railway	0		0					
	Walking		0		0					
	Bicycle		0		143					
	Other		0		0					
	Outbound	Motorcycle	M/C	32	49	1879	1975	2.5%	40	
		Bike Taxi		0		0				
		Bajaji		17		96				
		Passenger car	Car	214	248	1308	1532	16.2%	6	
		Pick-up/Van		31		208				
		Taxi		3		16				
		Micro bus(Daladala)	Bus	60	292	599	1491	19.6%	5	
		Medium/Small daladala		224		783				
		Large bus		2		55				
		School Bus		6		54				
		2 Axles Truck	Truck	56	153	346	756	20.2%	5	
3 Axles truck		58		177						
Heavy truck		39		232						
BRT		BRT	0		0					
Ferry		Ferry	0		0					
Railway	Railway	0		0						
Walking		0		0						
Bicycle		0		148						
Other		1		0						

Source: JST

● Annex 4-10: Public Transport Users and Car Users Interview Survey Result

**Preference for BRT by BRT Users**

Preference for BRT by BRT user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	95	1.	High	0	1.	Comfortable	3	1.	Secure	125	1.	Reasonable	62	1.	Convenient	15
2.	Somewhat Fast	395	2.	Somewhat High	183	2.	Somewhat Comfortable	53	2.	Somewhat Secure	355	2.	Somewhat Reasonable	20	2.	Somewhat Convenient	98
3.	Fair	15	3.	Fair	191	3.	Fair	101	3.	Fair	23	3.	Fair	322	3.	Fair	90
4.	Somewhat Slow	1	4.	Somewhat Low	130	4.	Somewhat Uncomfortable	297	4.	Somewhat Danger	3	4.	Somewhat Expensive	100	4.	Somewhat Inconvenient	238
5.	Slow	1	5.	Low	3	5.	Uncomfortable	53	5.	Danger	0	5.	Expensive	2	5.	Inconvenient	66

**Preference for Daladala by BRT Users**

Preference for Daladala by BRT user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	2	1.	High	112	1.	Comfortable	4	1.	Secure	18	1.	Reasonable	330	1.	Convenient	371
2.	Somewhat Fast	1	2.	Somewhat High	334	2.	Somewhat Comfortable	5	2.	Somewhat Secure	209	2.	Somewhat Reasonable	86	2.	Somewhat Convenient	99
3.	Fair	2	3.	Fair	57	3.	Fair	7	3.	Fair	171	3.	Fair	90	3.	Fair	31
4.	Somewhat Slow	56	4.	Somewhat Low	1	4.	Somewhat Uncomfortable	78	4.	Somewhat Danger	108	4.	Somewhat Expensive	1	4.	Somewhat Inconvenient	5
5.	Slow	446	5.	Low	3	5.	Uncomfortable	413	5.	Danger	0	5.	Expensive	0	5.	Inconvenient	1

**Preference for Railway by BRT Users**

Preference for Railway by BRT user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	496	1.	High	6	1.	Comfortable	379	1.	Secure	457	1.	Reasonable	63	1.	Convenient	73
2.	Somewhat Fast	9	2.	Somewhat High	105	2.	Somewhat Comfortable	117	2.	Somewhat Secure	42	2.	Somewhat Reasonable	41	2.	Somewhat Convenient	433
3.	Fair	1	3.	Fair	139	3.	Fair	4	3.	Fair	5	3.	Fair	262	3.	Fair	0
4.	Somewhat Slow	1	4.	Somewhat Low	245	4.	Somewhat Uncomfortable	5	4.	Somewhat Danger	2	4.	Somewhat Expensive	131	4.	Somewhat Inconvenient	0
5.	Slow	0	5.	Low	11	5.	Uncomfortable	1	5.	Danger	0	5.	Expensive	8	5.	Inconvenient	0

### Preference for Daladala by Daladala Users

Preference for Daladala by Daladala user																	
Travel Speed			Time Reliability			Comfort			Security			Cost			Accessibility to Station		
1.	Fast	27	1.	High	26	1.	Comfortable	16	1.	Secure	10	1.	Reasonable	26	1.	Convenient	12
2.	Somewhat Fast	92	2.	Somewhat High	96	2.	Somewhat Comfortable	72	2.	Somewhat Secure	33	2.	Somewhat Reasonable	51	2.	Somewhat Convenient	15
3.	Fair	323	3.	Fair	248	3.	Fair	330	3.	Fair	303	3.	Fair	388	3.	Fair	198
4.	Somewhat Slow	57	4.	Somewhat Low	125	4.	Somewhat Uncomfortable	81	4.	Somewhat Danger	152	4.	Somewhat Expensive	38	4.	Somewhat Inconvenient	193
5.	Slow	5	5.	Low	9	5.	Uncomfortable	5	5.	Danger	6	5.	Expensive	1	5.	Inconvenient	82

### Preference for BRT by Daladala Users

Preference for BRT by Daladala user																	
Travel Speed			Time Reliability			Comfort			Security			Cost			Accessibility to Station		
1.	Fast	425	1.	High	401	1.	Comfortable	331	1.	Secure	191	1.	Reasonable	15	1.	Convenient	16
2.	Somewhat Fast	69	2.	Somewhat High	94	2.	Somewhat Comfortable	108	2.	Somewhat Secure	104	2.	Somewhat Reasonable	12	2.	Somewhat Convenient	22
3.	Fair	10	3.	Fair	8	3.	Fair	65	3.	Fair	201	3.	Fair	93	3.	Fair	120
4.	Somewhat Slow	0	4.	Somewhat Low	1	4.	Somewhat Uncomfortable	0	4.	Somewhat Danger	3	4.	Somewhat Expensive	192	4.	Somewhat Inconvenient	211
5.	Slow	0	5.	Low	0	5.	Uncomfortable	0	5.	Danger	5	5.	Expensive	192	5.	Inconvenient	134

### Preference for Railway by Daladala Users

Preference for Railway by Daladala user																	
Travel Speed			Time Reliability			Comfort			Security			Cost			Accessibility to Station		
1.	Fast	470	1.	High	416	1.	Comfortable	332	1.	Secure	257	1.	Reasonable	95	1.	Convenient	15
2.	Somewhat Fast	27	2.	Somewhat High	64	2.	Somewhat Comfortable	81	2.	Somewhat Secure	77	2.	Somewhat Reasonable	56	2.	Somewhat Convenient	29
3.	Fair	7	3.	Fair	23	3.	Fair	86	3.	Fair	164	3.	Fair	333	3.	Fair	88
4.	Somewhat Slow	0	4.	Somewhat Low	1	4.	Somewhat Uncomfortable	1	4.	Somewhat Danger	6	4.	Somewhat Expensive	14	4.	Somewhat Inconvenient	196
5.	Slow	0	5.	Low	0	5.	Uncomfortable	4	5.	Danger	0	5.	Expensive	6	5.	Inconvenient	176

### Preference for Railway by Railway Users

Preference for Railway by Railway user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	453	1.	High	339	1.	Comfortable	229	1.	Secure	466	1.	Reasonable	307	1.	Convenient	29
2.	Somewhat Fast	57	2.	Somewhat High	152	2.	Somewhat Comfortable	168	2.	Somewhat Secure	45	2.	Somewhat Reasonable	33	2.	Somewhat Convenient	57
3.	Fair	0	3.	Fair	22	3.	Fair	103	3.	Fair	3	3.	Fair	143	3.	Fair	99
4.	Somewhat Slow	0	4.	Somewhat Low	1	4.	Somewhat Uncomfortable	15	4.	Somewhat Danger	1	4.	Somewhat Expensive	26	4.	Somewhat Inconvenient	195
5.	Slow	0	5.	Low	0	5.	Uncomfortable	0	5.	Danger	0	5.	Expensive	6	5.	Inconvenient	134

### Preference for BRT by Railway Users

Preference for BRT by Railway user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	171	1.	High	77	1.	Comfortable	17	1.	Secure	162	1.	Reasonable	40	1.	Convenient	11
2.	Somewhat Fast	305	2.	Somewhat High	330	2.	Somewhat Comfortable	194	2.	Somewhat Secure	309	2.	Somewhat Reasonable	47	2.	Somewhat Convenient	25
3.	Fair	33	3.	Fair	103	3.	Fair	78	3.	Fair	43	3.	Fair	123	3.	Fair	79
4.	Somewhat Slow	2	4.	Somewhat Low	5	4.	Somewhat Uncomfortable	173	4.	Somewhat Danger	1	4.	Somewhat Expensive	167	4.	Somewhat Inconvenient	225
5.	Slow	4	5.	Low	0	5.	Uncomfortable	53	5.	Danger	0	5.	Expensive	138	5.	Inconvenient	173

### Preference for Daladala by Railway Users

Preference for Daladala by Railway user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	2	1.	High	11	1.	Comfortable	6	1.	Secure	26	1.	Reasonable	187	1.	Convenient	46
2.	Somewhat Fast	21	2.	Somewhat High	190	2.	Somewhat Comfortable	26	2.	Somewhat Secure	212	2.	Somewhat Reasonable	215	2.	Somewhat Convenient	186
3.	Fair	29	3.	Fair	236	3.	Fair	64	3.	Fair	245	3.	Fair	108	3.	Fair	205
4.	Somewhat Slow	128	4.	Somewhat Low	51	4.	Somewhat Uncomfortable	123	4.	Somewhat Danger	30	4.	Somewhat Expensive	4	4.	Somewhat Inconvenient	60
5.	Slow	335	5.	Low	26	5.	Uncomfortable	295	5.	Danger	2	5.	Expensive	1	5.	Inconvenient	18

### Preference for Car by Car Users

Preference for Car by Car user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	229	1.	High	64	1.	Comfortable	134	1.	Secure	170	1.	Reasonable	111	1.	Convenient	140
2.	Somewhat Fast	148	2.	Somewhat High	172	2.	Somewhat Comfortable	139	2.	Somewhat Secure	151	2.	Somewhat Reasonable	147	2.	Somewhat Convenient	100
3.	Fair	120	3.	Fair	254	3.	Fair	203	3.	Fair	160	3.	Fair	198	3.	Fair	212
4.	Somewhat Slow	16	4.	Somewhat Low	24	4.	Somewhat Uncomfortable	35	4.	Somewhat Danger	32	4.	Somewhat Expensive	39	4.	Somewhat Inconvenient	42
5.	Slow	2	5.	Low	1	5.	Uncomfortable	4	5.	Danger	2	5.	Expensive	20	5.	Inconvenient	21

### Preference for BRT by Car Users

Preference for BRT by Car user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	486	1.	High	292	1.	Comfortable	235	1.	Secure	253	1.	Reasonable	227	1.	Convenient	205
2.	Somewhat Fast	25	2.	Somewhat High	83	2.	Somewhat Comfortable	104	2.	Somewhat Secure	133	2.	Somewhat Reasonable	142	2.	Somewhat Convenient	138
3.	Fair	3	3.	Fair	130	3.	Fair	152	3.	Fair	102	3.	Fair	107	3.	Fair	138
4.	Somewhat Slow	1	4.	Somewhat Low	8	4.	Somewhat Uncomfortable	21	4.	Somewhat Danger	23	4.	Somewhat Expensive	26	4.	Somewhat Inconvenient	28
5.	Slow	0	5.	Low	2	5.	Uncomfortable	3	5.	Danger	4	5.	Expensive	11	5.	Inconvenient	6

### Preference for Railway by Car Users

Preference for Railway by Car user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	460	1.	High	292	1.	Comfortable	158	1.	Secure	189	1.	Reasonable	130	1.	Convenient	165
2.	Somewhat Fast	37	2.	Somewhat High	111	2.	Somewhat Comfortable	129	2.	Somewhat Secure	119	2.	Somewhat Reasonable	209	2.	Somewhat Convenient	125
3.	Fair	15	3.	Fair	102	3.	Fair	166	3.	Fair	164	3.	Fair	151	3.	Fair	184
4.	Somewhat Slow	2	4.	Somewhat Low	9	4.	Somewhat Uncomfortable	53	4.	Somewhat Danger	40	4.	Somewhat Expensive	23	4.	Somewhat Inconvenient	35
5.	Slow	1	5.	Low	1	5.	Uncomfortable	9	5.	Danger	3	5.	Expensive	2	5.	Inconvenient	6



**Preference for Preference for Ferry by Ferry Users**

Preference for Ferry by Ferry user																	
Travel Speed			Time Reliability			Comfort		Security		Cost		Accessibility to Station					
1.	Fast	47	1.	High	42	1.	Comfortable	68	1.	Secure	95	1.	Reasonable	83	1.	Convenient	70
2.	Somewhat Fast	44	2.	Somewhat High	44	2.	Somewhat Comfortable	51	2.	Somewhat Secure	52	2.	Somewhat Reasonable	45	2.	Somewhat Convenient	49
3.	Fair	56	3.	Fair	52	3.	Fair	57	3.	Fair	36	3.	Fair	49	3.	Fair	48
4.	Somewhat Slow	13	4.	Somewhat Low	27	4.	Somewhat Uncomfortable	21	4.	Somewhat Danger	16	4.	Somewhat Expensive	11	4.	Somewhat Inconvenient	20
5.	Slow	44	5.	Low	39	5.	Uncomfortable	7	5.	Danger	5	5.	Expensive	16	5.	Inconvenient	17

● Annex 4-11: List of Freight Transport Company Interview Survey

No.	COMPANY	INTERVIEW DATE	BRANDED ITEMS/OR PRODUCTS	NO. OF DRIVERS
1	TANGA FRESH LTD	2-Aug-17	Tanga Fresh Milk	16
2	TANZANIA BREWERIES LTD	14-Feb-17	Safari Lager, Ndovu Beer, Castle Lite, etc	23
3	SBC(T) LTD (PEPSI)	16-Feb-17	Pepsi, 7Up, Mirinda	64
4	SADOLIN PAINTS (T) LTD	16-Feb-17	Sadolin paints	6
5	ASAS DIARIES LTD	17-Feb-17	Asas Milk	14
6	WATER COM (AFYA WATER)	18-Feb-17	Afya Mineral Drinking Water	25
7	MILCOM(DAR FRESH)	18-Feb-17	Dar Fresh Milk	16
8	AQUA COOL LTD (KISIMA)	20-Feb-17	Kisima Drinking Water	20
9	OIL COM TANZANIA LTD (O-GAS)	21-Feb-17	O-Gas	5
10	MIHAN GAS COMPANY LTD	21-Feb-17	Mihan Gas	15
11	AZAM CSD	22-Feb-17	Azam Cola,Energy Drinks	26
12	BAKHRESA FOOD PRODUCTS LTD (UHAI DRINKING WATER)	23-Feb-17	Uhai Mineral Drinking Water	30
13	BAKHRESA FOOD PRODUCTS LTD (AZAM SEA LINK & CARGO TRANSPORTS)	24-Feb-17	Transport of Azam products	61
14	MURZAH WILMAR EAST AFRICA LTD	27-Feb-17	Korie Cooking Oil	36
15	BAKHRESA FOOD PRODUCTS LTD (FRUIT JUICES)	28-Feb-17	Azam Embe Juice, Tropical Juice	15
16	BAKHRESA FOOD PRODUCTS LTD (ICE CREAM)	28-Feb-17	Azam Ice cream, Caramello, Choko Chips,Komamanga	13
17	BAKHRESA FOOD PRODUCTS LTD (AZAM BAKERY BREAD)	28-Feb-17	Azam Bread, Azam Chapati	17
18	BAKHRESA FOOD PRODUCTS LTD (AZAM BAKERY BISCUIT)	28-Feb-17	Azam Glucose Biscuits	3
19	AZAM DIARY PRODUCT LTD(ADL)	3-Mar-17	Azam Milk	8
20	TOL GASES LTD	3-Mar-17	Oxygen, Carbondioxide and Helium Gases	26
21	BORA INDUSTRIES LTD	6-Mar-17	Bora Shoes	5
22	M/S GENERAL PETROLEUM	6-Mar-17	Engen Oil, DeoGen Oil, PETROGEN Oil and BY-GEN Oil	3
23	GOLD STAR PAINTS TANZANIA LTD	7-Mar-17	Gold Star Paints	11
24	MURZAH WILMAR EAST AFRICA LTD	7-Mar-17	Kuku bar soap	25
25	INSIGNIA LTD	8-Mar-17	Coral Paints	15
26	OMAR PACKAGING INDUSTRY LTD	8-Mar-17	Packages	8
27	FIVE START PRINTER LTD	8-Mar-17	Five star Books and Stationeries	3
28	TANZANIA PASTA INDUSTRIES LTD	8-Mar-17	Kasuku, Spaggetes, Santa Lucia	2
29	GREEN WASTE PRO	10-Mar-17	Solid Waste Management Dar es salaam City Center	21
30	COST MILLERS LTD	10-Mar-17	Nyati wheat flours	35
31	BIGBON GAS TANZANIA LTD	13-Mar-17	Bigbon Gas	6
32	TARMAL INDUSTRY LTD	15-Mar-17	SUNLIGHT Soap	7
33	MMI STEEL MILLS	15-Mar-17	Kiboko iron sheets, plastic pipes, water tanks and steel bars	30
34	ORYX GAS	16-Mar-17	Oryx Gas	35
35	SAID SALIM BAKHRESA & CO LTD (SSB)	16-Mar-17	Azam Wheat Flour	60
36	SHELY PHARMACEUTICAL LTD	17-Mar-17	Diclopal, Konfily, Panadol, etc	8
37	MIKOANI TRADERS LTD (AZANIA)	17-Mar-17	Azania Wheat Flour, Azania Cooking Oil	40
38	JAMBO PLASTICS (T) LTD	17-Mar-17	Jambo food containers, drums, domestic utensils, etc	10
39	ROYAL SOAP AND DETERGENTS INDUSTRY LTD	20-Mar-17	Foma,clinsoft	8
40	ORYX OIL COMPANY	21-Mar-17	Oryx oil	20
41	ORYX SERVICES AND SPECIALISTIES LTD	21-Mar-17	Enduro600, Break fluid premium, Axcella400	2
42	COCA COLA KWANZA LTD	22-Mar-17	Coca cola,Fanta,sprite	34
43	SUPER CONSTRUCTION CO.LTD	24-Mar-17	Ready mix concrete,blocks	8
44	CRJE EAST AFRICA LTD	24-Mar-17	Construction equipment	15
45	DAR BREW LTD	24-Mar-17	Chibuku	29
46	KAJENJERE TRADING CO LTD	27-Mar-17	Solid Waste Management Dar es salaam City	7
47	SITA STEEL ROLLINGS LTD	27-Mar-17	Steel Bars,Steel Pipes	6

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48	ELIAS TRANSPORT CO LTD	28-Mar-17	Construction materials	46
49	DIPPSI CONPRO LTD	28-Mar-17	Concrete	10
50	GROUP SIX INTERNATIONAL LTD	28-Mar-17	Supply of Construction equipment and materials	17
51	SAID SALIM BAKHRESA & CO LTD (AZAM LOCAL & INTERNATIONAL CARGO)	3-Apr-17	food and beverage	160
52	SPECIALISED HAULERS (T) LTD (SHTL)	3-Apr-17	Construction Material	65
53	MOHAMMED ENTERPRISES TANZANIA LIMITED (METL)	4-Apr-17	Vegetable Cooking Oils Bar Soap Drinking Water; etc	300
54	EAST AFRICAN WAREHOUSING (T) LIMITED (CAMEL CONCRETE)	10-Apr-17	Cement, Concrete	14
55	AL HUSHOOM INVESTMENT (T) LTD (OIL COM)	11-Apr-17	trade of Oil & Petroleum Products	120

● Annex 4-12: Result of Travel Speed Survey

**Travel Speed Survey Results (Morning Peak Hours)**

Morning Peak		Travel time(min)					Travel Speed(km/h)							
Section		Boundary-Miririty Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St	Total Travel Time	Section		Boundary-Miririty Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St				
Bagamoyo Road		distance(km)	23.4	7.3	4.9	35.6	distance(km)	0	23.4	7.3	4.9			
Travel Time (min)	Inbound	2007	30.3	18.3	8.7	57.3	Travel Speed (km/h)	Inbound	2007	46.3	23.9	33.8		
		2017	93.9	28.4	26.8	149.1			2017	15.0	15.4	11.0		
		balance	63.6	10.1	18.1				balance	-31.3	-8.5	-22.8		
	Outbound	2007	27.7	14.0	7.0	48.7		Outbound	2007	50.7	31.3	42.0		
		2017	44.2	14.3	13.4	71.9			2017	31.8	30.6	21.9		
		balance	16.5	0.3	6.4				balance	-18.9	-0.7	-20.1		
Morogoro Road		distance(km)	23.7	5.7	2.7	32.1	distance(km)	0	23.7	5.7	2.7			
Travel Time (min)	Inbound	2007	33.0	14.0	10.2	57.2	Travel Speed (km/h)	Inbound	2007	43.0	24.4	15.9		
		2017	58.3	19.0	9.4	86.7			2017	24.4	18.0	17.2		
		balance	25.3	5.0	-0.8				balance	-18.6	-6.4	1.3		
	Outbound	2007	24.3	8.7	15.3	48.3		Outbound	2007	58.5	39.3	10.6		
		2017	45.0	14.5	11.4	70.9			2017	31.6	23.6	14.2		
		balance	20.7	5.8	-3.9				balance	-26.9	-15.7	3.6		
Nyerere Road		distance(km)	10.8	5.4	2.8	21.6	distance(km)	0	10.8	5.4	2.8			
Travel Time (min)	Inbound	2007	22.7	23.5	15.7	9.5	71.4	Travel Speed (km/h)	Inbound	2007	28.5	13.8	10.7	16.4
		2017	41.7	24.1	4.8	14.8	85.4			2017	15.5	13.4	35.0	10.5
		balance	19.0	0.6	-10.9	5.3				balance	-13.0	-0.4	24.3	-5.9
	Outbound	2007	17.7	8.3	3.8	6.0	35.8		Outbound	2007	36.6	39.0	44.2	26.0
		2017	36.1	12.7	7.3	10.6	66.7			2017	18.0	25.5	23.0	14.7
		balance	18.4	4.4	3.5	4.6				balance	-18.6	-13.5	-21.2	-11.3
Kilwa Road		distance(km)	11.5	5.3	16.8		distance(km)	0	11.5	5.3				
Travel Time (min)	Inbound	2007	33.0	16.7	49.7		Travel Speed (km/h)	Inbound	2007	20.9	19.0			
		2017	30.8	24.8	55.6				2017	22.4	12.8			
		balance	-2.2	8.1					balance	1.5	-6.2			
	Outbound	2007	22.8	14.0	36.8			Outbound	2007	30.7	22.7			
		2017	25.6	21.9	47.5				2017	27.0	14.5			
		balance	2.8	7.9					balance	-3.7	-8.2			

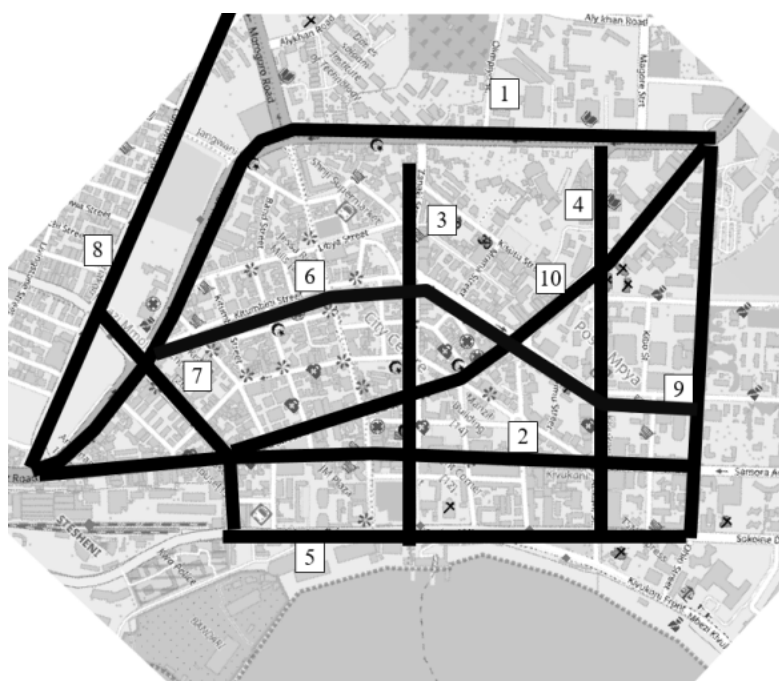
**Travel Speed Survey Results (Evening Peak Hours)**

Evening Peak		Travel time(min)					Travel Speed(km/h)								
Section	Boundary-Military Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St	Total Travel Time		Section	Boundary-Military Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St						
											distance(km)	2007	2017	balance	2007
Bagamoyo Road	Travel Time (min)	Inbound	2007	29.8	17.5	7.7	55.0	Travel Speed (km/h)	Inbound	2007	47.1	25.0	38.2		
			2017	111.0	14.5	15.1	140.6			2017	12.6	30.2	19.5		
			balance	81.2	-3.0	7.4				balance	-34.5	5.2	-18.7		
	Outbound	2007	34.5	24.8	23.3	82.6	2007	40.0	17.7	12.6					
		2017	69.0	21.9	14.5	105.4	2017	20.3	20.0	20.3					
		balance	34.5	-2.9	-8.8		balance	-19.7	2.3	7.7					
Morogoro Road	Travel Time (min)	Inbound	2007	28.3	11.5	6.6	46.4	Travel Speed (km/h)	Inbound	2007	50.2	29.7	23.8		
			2017	41.8	17.5	8.4	67.7			2017	34.0	19.5	19.3		
			balance	13.5	6.0	1.8				balance	-16.2	-10.2	-4.5		
	Outbound	2007	27.5	23.8	10.5	61.8	2007	51.7	14.4	15.4					
		2017	37.4	25.2	21.1	83.7	2017	38.0	13.6	7.7					
		balance	9.9	1.4	10.6		balance	-13.7	-0.8	-7.7					
Nyerere Road	Travel Time (min)	Inbound	2007	17.7	7.5	5.3	10.0	40.5	Travel Speed (km/h)	Inbound	2007	36.6	43.2	31.7	15.6
			2017	51.1	11.6	5.4	25.2	93.3			2017	12.7	27.9	31.1	6.2
			balance	33.4	4.1	0.1	15.2				balance	-23.9	-15.3	-0.6	-9.4
	Outbound	2007	18.3	6.8	6.8	12.2	44.1	2007	35.4	47.6	24.7	12.8			
		2017	40.0	12.6	10.4	8.5	71.5	2017	16.2	25.7	16.2	18.4			
		balance	21.7	5.8	3.6	-3.7		balance	-19.2	-21.9	-8.5	5.6			
Kilwa Road	Travel Time (min)	Inbound	2007	24.0	12.3		36.3	Travel Speed (km/h)	Inbound	2007	28.8	25.9			
			2017	37.2	17.6		54.8			2017	18.5	18.1			
			balance	13.2	5.3					balance	-10.3	-7.8			
	Outbound	2007	24.5	15.5		40.0	2007	28.2	20.5						
		2017	29.6	21.3		50.9	2017	23.3	14.9						
		balance	5.1	5.8			balance	-4.9	-5.6						

**Travel Speed Survey Results (Off peak hours)**

Off Peak		Travel time(min)					Travel Speed(km/h)								
Section		Boundary-Military Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St	Total Travel Time	Section		Boundary-Military Camp	Military Camo-Kawawa Jct	Kawawa Jct - Ohio St					
Bagamoyo Road	distance(km)		23.4	7.3	4.9		distance(km)		23.4	7.3	4.9				
	Travel Time (min)	Inbound	2007	31.2	17.3	7.8	56.3	Travel Speed (km/h)	Inbound	2007	45.0	25.3	37.7		
			2017	70.3	16.3	14.5	101.1			2017	20.0	26.9	20.3		
			balance	39.1	-1.0	6.7				balance	-25.0	1.6	-17.4		
	Outbound	2007	33.8	14.5	7.5	55.8	Outbound	2007	41.5	30.2	39.2				
		2017	44.1	18.7	22.1	84.9		2017	31.8	23.4	13.3				
		balance	10.3	4.2	14.6			balance	-9.7	-6.8	-25.9				
	Morogoro Road	distance(km)		23.7	5.7	2.7		distance(km)		23.7	5.7	2.7			
Travel Time (min)		Inbound	2007	25.2	11.7	11.7	48.6	Travel Speed (km/h)	Inbound	2007	56.4	29.2	13.8		
			2017	37.0	21.6	8.6	67.2			2017	38.4	15.8	18.8		
			balance	11.8	9.9	-3.1				balance	-18.0	-13.4	5.0		
Outbound		2007	22.5	8.5	8.3	39.3	Outbound	2007	63.2	40.2	19.5				
		2017	35.0	16.1	9.3	60.4		2017	40.6	21.2	17.4				
		balance	12.5	7.6	1.0			balance	-22.6	-19.0	-2.1				
Nyerere Road		distance(km)		10.8	5.4	2.8	2.6	distance(km)		10.8	5.4	2.8	2.6		
	Travel Time (min)	Inbound	2007	16.0	8.2	7.3	11.5	43	Travel Speed (km/h)	Inbound	2007	40.5	39.5	23.0	13.6
			2017	29.0	14.6	11.1	7.2	61.9			2017	22.3	22.2	15.1	21.7
			balance	13.0	6.4	3.8	-4.3				balance	-18.2	-17.3	-7.9	8.1
	Outbound	2007	20.3	6.8	3.8	12.7	43.6	Outbound	2007	31.9	47.6	44.2	12.3		
		2017	31.2	15.6	7.5	7.4	61.7		2017	20.8	20.8	22.4	21.1		
		balance	10.9	8.8	3.7	-5.3			balance	-11.1	-26.8	-21.8	8.8		
	Kilwa Road	distance(km)		11.5	5.3			distance(km)		11.5	5.3				
Travel Time (min)		Inbound	2007	20.8	16.0	36.8		Travel Speed (km/h)	Inbound	2007	33.2	19.9			
			2017	30.2	14.6	44.8				2017	22.8	21.8			
			balance	9.4	-1.4					balance	-10.4	1.9			
Outbound		2007	22.0	15.5	37.5		Outbound	2007	31.4	20.5					
		2017	22.7	13.1	35.8			2017	30.4	24.3					
		balance	0.7	-2.4				balance	-1.0	3.8					

● Annex 4-13: Result of Roadside Parking Survey



No.	Objective Roads
(1)	Bibi Titit Mohamed Road
(2)	Samora Avenue
(3)	Zanaki Street
(4)	Azikiwe Road
(5)	Sokoine Drive
(6)	Jamhuri Street
(7)	Uhuru Street
(8)	Lumumba Street
(9)	Ohio Street
(10)	India Street

(1) Bibi Titi Mohamed Road

Road Side Parking Bibi Titi Mohamed Road																					
Bibi Titi Mohamed Road																					
07:00-09:00(morning)																					
Right hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	20	0	0	0	0	0	0	0	0	0	6	8	14	23	0	5	5	7	0	0	88
Taxi	0	0	0	0	0	0	0	0	0	0	2	0	18	3	0	0	0	1	0	0	24
Pickup and Vans	0	0	0	0	0	0	0	0	0	0	6	0	8	1	0	1	1	1	0	0	18
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>8</b>	<b>40</b>	<b>27</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>130</b>

Bibi Titi Mohamed Road																					
12:00-14:00(noon)																					
Right hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	60	0	0	0	0	0	0	0	0	0	15	13	67	68	0	15	25	21	5	0	289
Taxi	0	0	0	0	0	0	0	0	0	0	0	0	33	7	0	0	9	0	0	0	49
Pickup and Vans	5	0	0	0	0	0	0	0	0	0	1	0	2	3	0	0	0	5	0	0	16
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	10	0	0	0	0	0	0	0	0	0	12	9	0	1	0	0	0	0	0	0	32
<b>Total</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>22</b>	<b>102</b>	<b>79</b>	<b>0</b>	<b>15</b>	<b>34</b>	<b>26</b>	<b>5</b>	<b>0</b>	<b>386</b>

Bibi Titi Mohamed Road																					
16:00-18:00(evening)																					
Right hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	15	0	0	2	0	0	0	0	0	0	45	16	16	36	0	6	23	7	0	0	166
Taxi	0	0	0	0	0	0	0	0	1	0	1	0	1	6	0	0	4	1	0	0	14
Pickup and Vans	2	0	0	0	0	0	0	0	0	0	2	0	3	1	0	0	2	0	0	0	10
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	0	0	0	0	0	0	0	0	0	0	11	2	9	0	0	7	1	0	0	0	30
<b>Total</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>48</b>	<b>27</b>	<b>22</b>	<b>54</b>	<b>0</b>	<b>6</b>	<b>36</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>222</b>

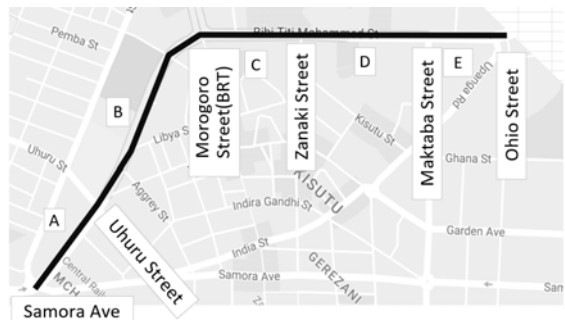
Bibi Titi Mohamed Road																					
07:00-09:00(morning)																					
Left hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	0	0	15	19	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0	42
Taxi	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	6
Pickup and Vans	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	11	10	3	9	0	3	9	0	0	0	15	0	0	0	0	0	0	0	0	0	42
Motorcycles	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	6	14
<b>Total</b>	<b>11</b>	<b>10</b>	<b>23</b>	<b>19</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>105</b>

Bibi Titi Mohamed Road																					
12:00-14:00(noon)																					
Left hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	16	0	4	39	0	0	0	0	0	0	7	0	0	0	0	7	0	0	6	0	79
Taxi	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Pickup and Vans	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bajaji	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	6
Daladala	12	7	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
Motorcycles	0	1	0	0	0	6	2	0	0	0	12	0	0	0	0	7	0	0	7	0	35
<b>Total</b>	<b>29</b>	<b>8</b>	<b>8</b>	<b>51</b>	<b>0</b>	<b>8</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>155</b>

Bibi Titi Mohamed Road																					
16:00-18:00(evening)																					
Left hand side																		31/1/2017			
VEHICLE TYPE	ONSTREET RESERVED					ON STREET NON-RESERVED					OFF STREET RESERVED					OFF STREET NON-RESERVED					Total
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
Passenger Car	1	0	2	39	0	0	0	0	0	0	0	0	0	0	0	1	0	0	14	0	57
Taxi	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	7
Pickup and Vans	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3
Trucks	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	14	8	4	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	33
Motorcycles	0	0	0	1	0	0	0	0	0	0	22	0	0	0	0	3	2	17	0	0	45
<b>Total</b>	<b>15</b>	<b>8</b>	<b>7</b>	<b>45</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>4</b>	<b>31</b>	<b>0</b>	<b>146</b>

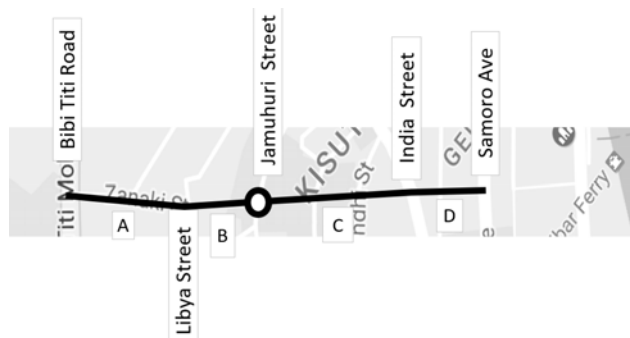






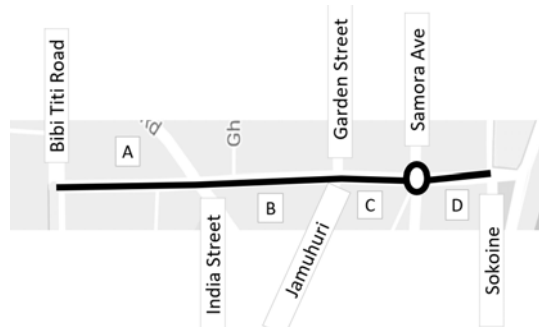
(3) Zanaki Street

Road Side Parking Zanaki Street																	
Zanaki Street		07:00-09:00(morning)				Right hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	0	0	0	13	6	3	28	20	59	0	85	15	0	0	0	0	229
Taxi	0	0	0	0	0	0	0	0	10	0	29	0	0	0	0	0	39
Pickup and Vans	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	3
Trucks	0	0	0	0	3	0	0	0	4	0	4	0	0	0	0	0	11
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	4
Motorcycles	0	0	0	0	0	0	2	0	20	0	9	0	0	0	0	0	31
Total	0	0	0	13	9	3	31	20	95	0	130	16	0	0	0	0	317
Zanaki Street		12:00-14:00(noon)				Right hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	0	0	0	18	2	1	28	36	65	0	112	27	1	2	2	0	294
Taxi	0	0	0	0	0	0	7	0	7	0	26	0	0	0	0	0	40
Pickup and Vans	0	0	0	0	0	0	2	0	4	0	4	0	0	0	0	0	10
Trucks	0	0	0	0	7	0	0	1	4	0	1	0	0	0	1	0	14
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	0	0	0	1	1	0	14	0	16	0	12	0	4	0	8	0	56
Total	0	0	0	19	10	1	51	37	96	0	155	27	5	2	11	0	414
Zanaki Street		16:00-18:00(evening)				Right hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	0	0	0	13	3	0	31	21	61	0	98	16	0	1	6	0	250
Taxi	0	0	0	0	0	0	7	0	11	0	33	0	0	0	1	0	52
Pickup and Vans	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Trucks	0	0	0	0	3	0	1	0	4	0	4	0	0	0	0	0	12
Bajaji	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	3
Daladala	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
Motorcycles	0	0	0	0	3	1	1	0	21	0	5	0	4	2	17	0	54
Total	0	0	0	13	9	1	42	21	100	0	141	17	5	3	24	0	376
Zanaki Street		07:00-09:00(morning)				Left hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	9	0	0	0	14	6	40	6	9	3	0	0	0	43	20	61	211
Taxi	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	21	24
Pickup and Vans	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	3
Trucks	0	0	0	0	1	0	0	3	0	0	0	0	0	0	6	1	11
Bajaji	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Motorcycles	2	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	9
Total	12	0	0	0	16	7	49	10	9	3	0	0	0	44	27	83	260
Zanaki Street		12:00-14:00(noon)				Left hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	38	14	4	11	45	31	30	39	43	2	19	13	35	45	43	125	537
Taxi	6	1	0	0	2	0	7	5	0	1	0	0	0	4	9	5	40
Pickup and Vans	0	1	0	0	2	0	3	8	0	0	3	0	0	0	0	3	20
Trucks	0	3	0	0	15	0	11	1	0	0	0	0	1	5	0	4	40
Bajaji	3	0	0	0	0	20	2	0	0	0	0	0	2	4	0	1	32
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	2	0	0	0	19	10	31	6	0	0	0	0	0	2	14	4	88
Total	49	19	4	11	83	61	84	59	43	3	22	13	38	60	66	142	757
Zanaki Street		16:00-18:00(evening)				Left hand side				31/1/2017							
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
Passenger Car	42	5	2	0	19	24	16	9	13	3	19	19	0	46	45	73	335
Taxi	15	1	0	0	0	0	4	3	0	0	0	0	0	0	0	15	38
Pickup and Vans	1	0	0	0	0	5	3	2	0	2	3	2	0	5	1	1	25
Trucks	3	0	0	0	0	3	0	0	0	0	0	3	0	0	5	0	14
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	13	0	0	0	8	5	14	0	0	0	0	0	0	11	9	0	60
Total	74	6	2	0	27	37	37	14	13	5	22	24	0	62	60	89	472



(4) Azikiwe Street

Road Side Parking Azikiwe Street																		
Azikiwe Street		07:00-09:00(morning)				Right hand side				2017/02/02								
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	30	50	14	8	6	5	4	21	32	2	2	0	6	5	22	7	Passenger Car	214
Taxi	5	5	0	1	1	0	1	3	4	2	0	0	2	0	1	0	Taxi	25
Pickup and Vans	8	3	0	0	0	0	0	9	1	0	0	0	1	0	6	0	Pickup and Vans	28
Trucks	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3	0	Trucks	8
Bajaji	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	Bajaji	4
Daladala	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Daladala	4
Motorcycles	2	7	0	0	0	2	0	2	0	0	0	0	8	0	4	0	Motorcycles	25
Total	50	67	14	9	8	7	6	36	38	5	2	0	17	6	36	7	Total	308
Azikiwe Street 12:00-14:00(noon) Right hand side 2017/02/02																		
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	69	79	10	13	0	5	2	0	10	25	7	25	20	1	11	0	Passenger Car	277
Taxi	6	7	12	12	3	1	2	0	0	3	9	51	4	1	0	0	Taxi	111
Pickup and Vans	8	1	0	1	0	0	0	0	1	0	0	8	0	1	0	0	Pickup and Vans	20
Trucks	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	2
Bajaji	0	0	1	0	3	4	0	0	0	0	0	1	0	0	0	0	Bajaji	9
Daladala	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Daladala	1
Motorcycles					18	5	0	0	2	0	0	5	0	0	23	0	Motorcycles	53
Total	84	88	23	26	25	15	4	0	13	28	16	90	24	3	34	0	Total	473
Azikiwe Street 16:00-18:00(evening) Right hand side 2017/02/02																		
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	65	108	0	100	9	6	2	7	1	1	0	5	3	2	16	7	Passenger Car	332
Taxi	10	5	0	17	3	9	0	7	15	12	0	0	2	0	5	0	Taxi	85
Pickup and Vans	4	4	0	13	1	0	0	2	0	0	0	2	1	2	0	0	Pickup and Vans	29
Trucks	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	4
Bajaji	0	2	0	0	6	2	0	0	0	0	0	0	0	0	2	2	Bajaji	14
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	0
Motorcycles	1	1	0	0	9	0	0	0	0	0	0	5	0	19	28	9	Motorcycles	72
Total	80	120	0	134	28	17	2	16	16	13	0	12	6	23	51	18	Total	536
Azikiwe Street 07:00-09:00(morning) Left hand side 2017/02/02																		
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	26	4	0	0	9	6	1	0	0	3	0	56	0	2	0	27	Passenger Car	134
Taxi	10	0	0	0	0	0	0	0	8	0	0	30	0	0	0	0	Taxi	48
Pickup and Vans	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	Pickup and Vans	2
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	0
Bajaji	0	2	0	0	0	13	1	0	0	1	0	0	0	3	1	0	Bajaji	21
Daladala	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	19
Motorcycles	0	0	0	0	1	16	0	0	0	0	0	0	5	4	5	9	Motorcycles	40
Total	36	25	0	0	10	35	2	0	8	5	0	86	5	10	6	36	Total	264
Azikiwe Street 12:00-14:00(noon) Left hand side 2017/02/02																		
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	39	2	0	29	0	1	1	1	39	4	8	33	1	4	3	6	Passenger Car	171
Taxi	1	0	0	0	0	0	0	0	6	0	6	17	5	0	0	0	Taxi	35
Pickup and Vans	2	0	0	0	0	0	0	0	0	2	0	1	0	1	0	1	Pickup and Vans	7
Trucks	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	1
Bajaji	0	10	0	0	0	3	0	0	0	1	0	0	0	1	0	0	Bajaji	15
Daladala	0	28	0	0	0	2	0	0	0	0	0	0	0	0	0	0	Daladala	30
Motorcycles	0	5	0	0	0	10	0	0	2	0	0	0	0	3	3	0	Motorcycles	23
Total	43	45	0	29	0	16	1	1	47	7	14	51	6	9	6	7	Total	282
Azikiwe Street 16:00-18:00(evening) Left hand side 2017/02/02																		
VEHICLE TYPE	ONSTREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED					OFF STREET NON-RESERVED				Total
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
Passenger Car	10	0	0	17	2	0	0	3	0	1	0	15	2	2	1	1	Passenger Car	54
Taxi	2	0	0	0	0	0	0	0	6	0	0	16	4	0	0	0	Taxi	28
Pickup and Vans	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	Pickup and Vans	2
Trucks	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	Trucks	7
Bajaji	0	3	0	0	1	3	0	0	0	0	0	0	0	4	1	0	Bajaji	12
Daladala	0	28	0	0	3	21	0	0	1	0	0	0	0	0	0	0	Daladala	53
Motorcycles	0	1	0	2	0	0	0	0	0	5	0	0	3	7	0	0	Motorcycles	18
Total	12	32	0	19	6	32	0	3	7	6	0	31	9	13	2	2	Total	174





(6) Jamhuri Street

Jamhuri Street		07:00-09:00(morning)								Right hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	19	5	30	47	24	44	0	0	5	0	16	3	3	2	0	0	0	0	0	0	0	0	9	21	0	0	1	1	8	1	3	0	242	
Taxi	6	3	0	0	1	1	0	0	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	1	0	36	
Pickup and Vans	1	2	0	5	8	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	
Trucks	6	8	0	0	4	1	0	0	0	9	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	32	18	30	52	37	47	0	0	5	11	22	3	4	4	0	0	0	0	0	0	0	0	9	42	0	0	1	1	9	1	4	0	332	
Jamhuri street		12:00-14:00(noon)								Right hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	36	30	56	48	55	35	0	5	10	2	12	2	3	0	4	1	0	0	0	0	0	0	1	26	30	40	1	3	0	6	6	3	418	
Taxi	6	0	0	6	6	4	1	2	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	4	10	0	0	0	0	0	0	0	45	
Pickup and Vans	2	4	5	8	7	4	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	
Trucks	9	8	1	1	2	0	0	0	3	8	6	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	42	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	
Motorcycles	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
Total	53	42	63	64	72	46	1	8	13	10	18	3	3	0	4	1	9	0	0	0	0	0	1	38	34	50	1	4	1	7	6	3	558	
Jamhuri street		16:00-18:00(evening)								Left hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	23	1	18	71	34	46	6	2	0	0	16	2	0	0	0	0	2	0	2	4	0	0	25	1	0	0	0	9	10	8	11	0	291	
Taxi	6	0	0	0	4	3	10	5	0	0	2	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	1	0	0	0	0	0	38	
Pickup and Vans	2	0	4	10	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	
Trucks	1	13	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	21	
Bajaji	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Daladala	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	5	1	0	0	0	0	5	0	0	0	0	0	17	
Motorcycles	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Total	32	14	28	81	49	53	16	7	0	5	23	2	0	0	0	0	2	0	2	5	6	1	32	1	0	0	7	9	10	8	11	0	399	
Jamhuri street		07:00-09:00(morning)								Left hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	19	10	9	10	12	5	1	18	0	6	15	0	29	12	1	1	4	0	13	7	0	4	0	0	1	0	0	3	9	0	1	0	190	
Taxi	0	0	9	2	0	0	28	0	2	1	3	9	0	0	3	0	0	7	0	10	0	2	0	0	0	0	0	0	2	0	1	0	0	79
Pickup and Vans	0	2	2	0	0	3	1	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	13
Trucks	5	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	18
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Daladala	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	6	0	0	0	0	0	0	0	6	17	
Total	24	20	20	12	12	36	4	20	1	10	24	0	30	16	8	1	11	0	24	8	3	4	6	0	3	2	3	11	0	2	6	0	321	
Jamhuri street		12:00-14:00(noon)								Left hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	16	6	15	7	20	6	13	16	25	12	5	21	43	34	0	12	1	2	20	0	0	6	5	0	12	5	3	12	2	10	0	0	329	
Taxi	0	19	9	0	1	7	1	2	0	0	0	7	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	1	0	0	69
Pickup and Vans	0	1	0	0	0	0	0	0	1	0	3	1	2	1	0	0	3	0	8	0	0	1	0	4	3	0	0	3	0	0	2	0	33	
Trucks	0	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	3	0	0	0	0	0	0	0	3	2	0	1	0	0	0	0	15	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	3	0	1	1	0	8	
Total	16	29	24	7	21	13	14	18	26	14	17	22	53	37	0	12	7	2	29	8	0	7	5	4	15	8	7	21	4	12	3	0	455	
Jamhuri street		16:00-18:00(evening)								Left hand side								31/1/2017								Total								
VEHICLE TYPE	ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total	
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H		
Passenger Car	33	12	20	14	9	25	0	11	1	3	2	2	19	6	0	15	10	0	6	15	9	7	0	0	1	0	0	9	0	0	0	1	230	
Taxi	2	0	12	0	0	9	0	4	0	5	1	1	1	0	10	0	3	3	0	0	0	0	0	0	5	2	0	0	0	0	0	0	57	
Pickup and Vans	2	0	1	0	0	1	0	0	6	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	15	
Trucks	7	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	18	
Bajaji	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0</				

(7) Uhuru Street

Road Side Parking Uhuru Street														
Uhuru Street			07:00-09:00(morning)						Right hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	0	3	0	0	10	0	0	68	38	0	5	8	Total	132
Taxi	0	10	0	0	0	0	2	8	34	6	0	0	Total	60
Pickup and Vans	0	0	0	0	4	0	0	16	0	0	2	0	Total	22
Trucks	0	0	0	0	0	0	0	4	0	0	0	0	Total	4
Bajaji	48	0	0	0	0	0	0	0	0	0	0	0	Total	48
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	Total	0
Motorcycles	1	0	0	0	0	1	2	0	6	3	0	0	Total	13
<b>Total</b>	<b>49</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>4</b>	<b>96</b>	<b>78</b>	<b>9</b>	<b>7</b>	<b>8</b>	<b>Total</b>	<b>279</b>

Uhuru Street			12:00-14:00(noon)						Right hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	7	8	1	0	0	0	0	80	77	0	0	0	Total	173
Taxi	0	28	0	0	1	0	0	0	43	0	0	0	Total	72
Pickup and Vans	0	0	0	2	0	0	0	8	9	1	5	0	Total	25
Trucks	0	0	0	0	0	0	0	8	3	0	1	0	Total	12
Bajaji	35	0	2	2	0	0	0	2	1	0	1	0	Total	43
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	Total	0
Motorcycles	2	1	0	0	0	0	3	3	21	6	4	1	Total	41
<b>Total</b>	<b>44</b>	<b>37</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>101</b>	<b>154</b>	<b>7</b>	<b>11</b>	<b>1</b>	<b>Total</b>	<b>366</b>

Uhuru Street			16:00-18:00(evening)						Right hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	6	1	1	0	1	0	0	59	70	0	10	5	Total	153
Taxi	0	8	0	0	17	0	0	17	21	0	0	5	Total	68
Pickup and Vans	0	0	0	0	0	0	0	9	2	0	7	1	Total	19
Trucks	0	0	0	0	0	0	0	1	0	0	0	0	Total	1
Bajaji	0	0	0	0	0	0	0	35	0	0	0	0	Total	35
Daladala	0	0	0	0	0	0	0	35	0	0	0	0	Total	35
Motorcycles	0	0	0	0	0	0	17	5	14	0	2	0	Total	38
<b>Total</b>	<b>6</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>17</b>	<b>161</b>	<b>107</b>	<b>0</b>	<b>19</b>	<b>11</b>	<b>Total</b>	<b>349</b>

Uhuru Street			07:00-09:00(morning)						Left hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	1	0	0	0	0	0	0	21	11	2	97	3	Total	135
Taxi	0	0	0	0	0	0	0	1	0	0	4	0	Total	5
Pickup and Vans	0	0	0	0	0	0	0	3	5	0	6	2	Total	16
Trucks	0	0	0	0	0	0	0	0	3	0	0	0	Total	3
Bajaji	0	0	0	0	0	0	0	0	0	6	0	0	Total	6
Daladala	13	0	0	5	0	0	0	0	0	0	0	0	Total	18
Motorcycles	0	0	0	0	0	0	5	1	4	6	0	0	Total	16
<b>Total</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>26</b>	<b>23</b>	<b>14</b>	<b>107</b>	<b>5</b>	<b>Total</b>	<b>199</b>

Uhuru Street			12:00-14:00(noon)						Left hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	0	0	4	0	1	0	0	97	21	0	42	20	Total	185
Taxi	0	0	0	0	1	0	0	1	0	0	1	0	Total	3
Pickup and Vans	0	0	0	0	1	0	0	2	8	0	7	0	Total	18
Trucks	0	0	0	0	1	0	0	2	0	0	5	0	Total	8
Bajaji	0	0	0	0	0	0	0	0	0	5	0	0	Total	5
Daladala	20	0	0	1	0	0	0	0	0	0	0	0	Total	21
Motorcycles	0	0	0	0	0	0	0	2	2	18	6	0	Total	28
<b>Total</b>	<b>20</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>104</b>	<b>31</b>	<b>23</b>	<b>61</b>	<b>20</b>	<b>Total</b>	<b>268</b>

Uhuru Street			16:00-18:00(evening)						Left hand side			2017/02/02		
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED				
	A	B	C	A	B	C	A	B	C	A	B	C		
Passenger Car	0	0	1	1	2	1	0	83	15	0	21	15	Total	139
Taxi	0	0	0	0	0	0	0	3	1	0	3	0	Total	7
Pickup and Vans	0	0	0	0	0	0	0	6	7	0	10	0	Total	23
Trucks	0	0	1	0	0	3	0	1	0	0	0	0	Total	5
Bajaji	0	0	0	0	0	0	0	0	0	8	1	0	Total	9
Daladala	19	0	0	13	0	0	0	0	0	0	0	0	Total	32
Motorcycles	0	0	0	0	0	0	0	3	2	23	2	0	Total	30
<b>Total</b>	<b>19</b>	<b>0</b>	<b>2</b>	<b>14</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>96</b>	<b>25</b>	<b>31</b>	<b>37</b>	<b>15</b>	<b>Total</b>	<b>245</b>



(8) Lumumba Street

Road Side Parking Lumumba Street													
Lumumba Street			07:00-09:00(morning)			Right hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	76	70	106	9	1	0	4	6	7	5	7	51	342
Taxi	4	48	6	5	0	0	11	1	10	10	2	4	101
Pickup and Vans	10	20	7	0	0	0	1	0	0	0	0	5	43
Trucks	5	22	0	0	0	0	0	0	0	0	0	0	27
Bajaji	0	0	0	0	0	0	0	8	0	0	5	0	13
Daladala	0	2	0	1	0	0	0	0	0	0	0	0	3
Motorcycles	0	0	0	0	5	0	3	0	0	0	0	0	8
<b>Total</b>	<b>95</b>	<b>162</b>	<b>119</b>	<b>15</b>	<b>6</b>	<b>0</b>	<b>19</b>	<b>15</b>	<b>17</b>	<b>15</b>	<b>14</b>	<b>60</b>	<b>537</b>

Lumumba Street													
Lumumba Street			12:00-14:00(noon)			Right hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	139	86	109	26	0	2	21	3	26	4	0	63	479
Taxi	4	30	2	0	0	0	10	5	4	0	0	2	57
Pickup and Vans	20	26	10	2	0	0	3	2	1	0	0	3	67
Trucks	5	6	0	1	0	0	0	0	0	1	0	0	13
Bajaji	0	0	1	0	0	0	0	12	0	0	0	0	13
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	0	0	0	0	0	0	5	0	0	0	0	0	5
<b>Total</b>	<b>168</b>	<b>148</b>	<b>122</b>	<b>29</b>	<b>0</b>	<b>2</b>	<b>39</b>	<b>22</b>	<b>31</b>	<b>5</b>	<b>0</b>	<b>68</b>	<b>634</b>

Lumumba Street													
Lumumba Street			16:00-18:00(evening)			Right hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	102	100	76	6	1	0	22	1	10	1	0	67	386
Taxi	13	12	4	1	0	0	17	4	11	2	0	0	64
Pickup and Vans	26	23	8	5	0	0	4	0	0	0	0	1	67
Trucks	4	7	0	2	0	0	0	0	1	0	0	0	14
Bajaji	0	0	0	0	0	0	0	8	0	1	0	0	9
Daladala	1	4	0	0	0	0	0	0	0	0	0	0	5
Motorcycles	0	1	0	0	0	0	1	0	0	0	0	0	2
<b>Total</b>	<b>146</b>	<b>147</b>	<b>88</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>44</b>	<b>13</b>	<b>22</b>	<b>4</b>	<b>0</b>	<b>68</b>	<b>547</b>

Lumumba Street													
Lumumba Street			07:00-09:00(morning)			Left hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	45	41	25	0	0	0	20	20	25	25	20	27	248
Taxi	2	0	0	1	0	0	0	0	5	2	0	5	15
Pickup and Vans	31	15	15	1	0	0	0	15	0	7	5	2	91
Trucks	1	0	0	0	0	0	1	0	0	0	0	1	3
Bajaji	0	0	2	0	0	0	0	1	0	0	0	0	3
Daladala	1	3	1	0	0	0	0	0	0	0	0	0	5
Motorcycles	2	15	5	0	0	0	0	1	0	10	1	0	34
<b>Total</b>	<b>82</b>	<b>74</b>	<b>48</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>37</b>	<b>30</b>	<b>44</b>	<b>26</b>	<b>35</b>	<b>399</b>

Lumumba Street													
Lumumba Street			12:00-14:00(noon)			Left hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	104	92	52	25	7	22	44	19	19	62	68	45	559
Taxi	0	1	0	2	0	3	0	0	0	2	0	2	10
Pickup and Vans	21	6	7	3	4	2	5	1	1	5	9	5	69
Trucks	3	2	1	0	0	0	0	0	0	0	0	2	8
Bajaji	1	0	0	0	0	0	0	0	0	0	2	0	3
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	5	0	3	5	0	1	6	2	0	5	22	3	52
<b>Total</b>	<b>134</b>	<b>101</b>	<b>63</b>	<b>35</b>	<b>11</b>	<b>28</b>	<b>55</b>	<b>22</b>	<b>20</b>	<b>74</b>	<b>101</b>	<b>57</b>	<b>701</b>

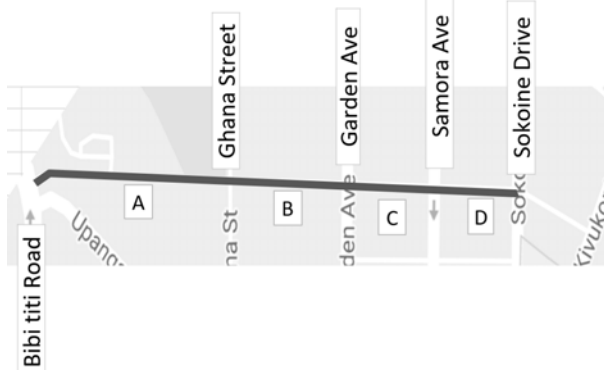
  

Lumumba Street													
Lumumba Street			16:00-18:00(evening)			Left hand side			2017/02/02				
VEHICLE TYPE	ONSTREET RESERVED			ON STREET NON-RESERVED			OFF STREET RESERVED			OFF STREET NON-RESERVED			Total
	A	B	C	A	B	C	A	B	C	A	B	C	
Passenger Car	76	73	16	15	10	30	81	62	19	27	32	18	459
Taxi	0	2	0	1	2	1	0	0	1	1	25	1	34
Pickup and Vans	10	6	3	1	0	3	13	13	1	3	4	3	60
Trucks	0	2	0	0	0	0	0	1	0	0	0	0	3
Bajaji	0	1	0	0	0	0	0	2	0	0	0	0	3
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles	5	4	0	0	1	0	10	16	2	2	21	7	68
<b>Total</b>	<b>91</b>	<b>88</b>	<b>19</b>	<b>17</b>	<b>13</b>	<b>34</b>	<b>104</b>	<b>94</b>	<b>23</b>	<b>33</b>	<b>82</b>	<b>29</b>	<b>627</b>



(9) Ohio Street

Road Side Parking Ohio Street																			
Ohio Street		07:00-09:00(morning)				Right hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	0	0	0	0	0	0	2	0	0	22	24	24	51	0	14	7	38	Passenger Car	182
Taxi	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	1	Taxi	11	
Pickup and Vans	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	Pickup and Vans	2	
Trucks	0	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	Trucks	4	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bajaji	0	
Daladala	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	Daladala	4	
Motorcycles	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	Motorcycles	6	
Total	0	0	0	0	1	2	0	0	34	31	24	53	0	14	7	43	Total	209	
Ohio Street		12:00-14:00(noon)				Right hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	0	0	0	0	5	0	1	0	0	0	51	110	0	56	1	42	Passenger Car	266	
Taxi	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	Taxi	3	
Pickup and Vans	0	0	0	0	0	0	0	0	0	0	5	0	2	3	0	0	Pickup and Vans	10	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	0	
Bajaji	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	Bajaji	3	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	Daladala	5	
Motorcycles	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	Motorcycles	2	
Total	0	0	0	0	7	0	2	0	0	0	51	116	0	58	4	51	Total	289	
Ohio Street		16:00-18:00(evening)				Right hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	0	0	0	0	11	2	1	4	0	0	8	97	0	21	0	5	Passenger Car	149	
Taxi	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	Taxi	3	
Pickup and Vans	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	Pickup and Vans	4	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	0	
Bajaji	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	Bajaji	4	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	0	
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Motorcycles	0	
Total	0	0	0	0	14	5	2	4	0	0	8	97	0	24	0	6	Total	160	
Ohio Street		07:00-09:00(morning)				Left hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	0	7	0	0	3	8	0	0	0	45	5	13	0	3	0	0	Passenger Car	84	
Taxi	2	0	0	0	0	1	0	0	0	13	0	0	0	0	0	0	Taxi	16	
Pickup and Vans	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	Pickup and Vans	3	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Trucks	0	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bajaji	0	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	0	
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Motorcycles	0	
Total	2	7	0	0	3	9	0	0	0	58	6	15	0	3	0	0	Total	103	
Ohio Street		12:00-14:00(noon)				Left hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	3	0	0	0	1	0	0	0	0	297	19	56	0	11	2	3	Passenger Car	392	
Taxi	0	0	0	0	0	0	0	0	0	30	0	5	0	0	0	0	Taxi	35	
Pickup and Vans	0	0	0	0	0	0	0	0	0	6	2	7	0	0	3	0	Pickup and Vans	18	
Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Trucks	1	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Bajaji	1	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	0	
Motorcycles	0	0	0	0	0	0	0	0	0	3	0	3	0	1	5	0	Motorcycles	12	
Total	3	0	0	0	1	0	0	0	0	336	22	71	0	12	11	3	Total	459	
Ohio Street		16:00-18:00(evening)				Left hand side				31/1/2017									
VEHICLE TYPE	ON STREET RESERVED				ON STREET NON-RESERVED				OFF STREET RESERVED				OFF STREET NON-RESERVED				Total		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D			
Passenger Car	0	0	0	0	1	0	0	0	0	118	26	35	0	18	0	0	Passenger Car	198	
Taxi	0	0	0	0	0	0	0	0	0	13	0	11	0	7	0	0	Taxi	31	
Pickup and Vans	0	0	0	0	0	0	0	0	1	2	8	4	0	0	0	0	Pickup and Vans	15	
Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Trucks	1	
Bajaji	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bajaji	0	
Daladala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Daladala	0	
Motorcycles	0	0	0	0	0	0	0	0	0	0	0	2	0	0	5	0	Motorcycles	7	
Total	0	0	0	0	1	0	0	0	1	133	35	52	0	25	5	0	Total	252	





(10) India Street

Road Side Parking Indian Street																																					
India street		07:00-09:00(morning)																Right hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		36	13	3	14	16	0	0	0	9	0	16	17	7	0	19	17	0	0	0	0	4	3	2	0	22	0	0	0	1	6	9	0	0	0	224	
Taxi		4	6	0	1	7	0	0	0	1	0	1	3	1	0	2	4	1	0	0	0	0	0	0	0	5	0	0	0	1	1	2	0	0	0	40	
Pickup and Vans		0	1	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Trucks		1	1	0	0	0	0	0	0	8	0	8	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	23	
Bajaji		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Daladala		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Total		41	21	3	15	23	0	0	0	18	0	26	25	9	0	21	23	1	0	0	0	4	3	2	0	27	0	0	0	2	7	11	0	0	11	293	
India street		12:00-14:00(noon)																Right hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		36	36	0	1	8	56	0	40	0	2	21	38	20	2	87	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	29	400	
Taxi		0	14	0	0	1	3	0	2	0	0	2	3	10	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	53	
Pickup and Vans		0	1	1	0	0	0	0	0	0	0	2	5	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
Trucks		0	1	0	0	0	0	0	1	0	0	21	1	3	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	35	
Bajaji		0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Daladala		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles		0	0	0	0	0	0	0	1	0	0	0	1	3	1	6	0	0	0	0	2	0	0	0	0	0	0	0	0	8	0	0	0	0	0	22	
Total		36	52	1	1	9	60	0	44	0	2	46	48	36	21	10	108	2	0	0	5	0	0	0	0	0	0	0	1	11	2	0	0	0	29	524	
India street		16:00-18:00(evening)																Right hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		31	24	0	2	10	0	0	50	0	0	22	27	27	22	1	37	1	0	0	0	0	0	0	0	0	11	0	0	0	0	17	0	0	0	5	288
Taxi		0	14	0	0	0	0	0	4	0	0	4	0	14	3	6	10	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	63	
Pickup and Vans		1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Trucks		2	0	1	0	0	0	0	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	
Bajaji		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Daladala		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles		0	0	0	0	0	0	0	0	0	0	1	0	2	0	9	1	0	0	0	1	0	0	0	0	0	0	0	1	4	0	3	0	0	0	22	
Total		34	39	1	2	10	0	0	54	0	0	39	30	43	25	16	48	1	1	0	1	0	0	0	0	11	0	0	1	12	0	20	0	0	5	393	
India street		07:00-09:00(morning)																Left hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		3	0	5	4	0	0	0	0	14	10	7	6	0	3	10	15	2	0	3	0	0	0	0	0	41	30	19	0	1	0	0	0	0	11	184	
Taxi		2	0	0	3	2	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
Pickup and Vans		1	0	1	2	0	0	0	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	15	
Trucks		0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Bajaji		0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Daladala		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles		0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	0	0	0	4	5	0	1	10	0	0	0	0	0	29	
Total		6	0	6	10	2	2	0	1	19	10	10	8	1	3	10	18	3	0	8	0	0	0	0	0	48	38	20	1	11	0	0	0	0	11	246	
India street		12:00-14:00(noon)																Left hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		0	0	5	5	1	1	0	7	17	15	17	5	2	44	4	37	3	2	0	13	3	0	0	0	20	61	53	32	0	11	2	0	0	1	361	
Taxi		0	0	0	0	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	
Pickup and Vans		1	0	0	2	0	0	0	0	4	4	2	1	0	0	0	0	2	2	2	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	26	
Trucks		0	0	0	0	0	0	1	1	1	2	12	0	0	0	0	0	0	0	3	1	0	0	0	0	1	1	3	1	1	2	1	0	0	0	32	
Bajaji		0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Daladala		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles		0	0	0	0	0	0	1	0	0	0	1	0	4	1	12	1	2	0	0	1	0	0	0	0	4	8	4	2	8	2	0	0	0	1	52	
Total		1	0	5	16	1	3	2	13	22	21	33	6	6	45	16	40	10	5	0	15	3	0	0	0	21	69	66	40	3	21	5	0	0	2	490	
India street		16:00-18:00(evening)																Left hand side																2017/02/02			
VEHICLE TYPE		ON STREET RESERVED								ON STREET NON-RESERVED								OFF STREET RESERVED								OFF STREET NON-RESERVED								Total			
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
Passenger Car		0	0	7	6	0	0	0	2	0	23	22	2	0	34	0	28	3	0	0	15	0	0	0	0	17	59	19	34	4	4	0	0	0	1	280	
Taxi		6	0	4	6	0	4	2	1	0	0	0	1	0	2	0																					



## **Annex-5: Demand Forecast**

### **(For Chapter-8)**

---

- Annex 5-1: Description & Data (saved in the attached CD-R)



## ● Annex 5-1. Description & Data (saved in the attached CD-R)

### (1) Data type and format

Data for Road traffic assignment and Public transit assignment are stored. Types of data and the format are shown as follows;

[Road traffic assignment]

Road traffic assignment are done by using JICA STRADA. Therefore, there files can be opened and used by JICA STRADA.

#### - Input data for JICA STRADA

Network file (.csv), Parameter file (.par), OD file (.csv)

#### - Output data for JICA STRADA

Assignment result file (.csv)

“Network file” is road network data for traffic assignment, and it contains each link’s attributions. Data format is not “INT” which is unique to JICA STRADA, but “CSV”. There are 3types of road network, which are network at 2017, network at 2030 and network at 2040. Network at 2017 is corresponding to current road network, and is used for represent the 2017 traffic situation for verification of the model and also used for Do-Nothing case. Network at 2030 includes newly developed route, such as the northern half section of Middle Ring road, Expressway from Kigamboni to Kibamba. Network at 2040 includes the Middle Ring road, Expressway and Bay link.

“Parameter file” specifies the calculation method and conditions such as structure information (Number of links, zones, nodes...), time value by each vehicle type, and so on.

“OD file” contains road traffic assignment OD data by each type of 6vehicles (MC, Car, Bus, 2Axle Truck, 3Axle Truck and Heavy Truck). In each line, i zone, j zone, OD traffic volume are included in this order. Relationship between zone number and zone is shown in Figure 1, 2 and Table 1, 2. In the analysis, peripheral region and countries are included. These regions aren’t shown in the map, but are listed in the lower part of Table 2.

Zoning system for Transport demand forecast is basically 198zones. For calculation of road traffic assignment, zone dividing is done for accuracy improvement. Specifically, Zone No.62 is divided into 2zones. The dividing ratio is 64.7% and 35.3%. The newly generated zone, which has 35.3% of original zone, is named as Zone No.199. Therefore, stored data files for road traffic assignment is based on 199zone system.

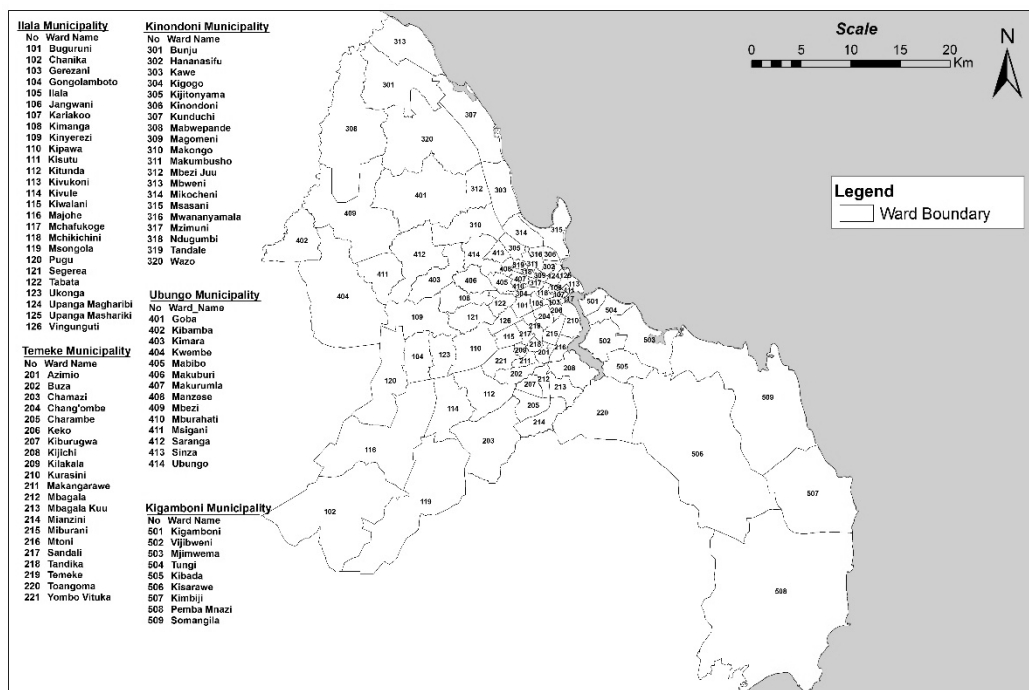


Figure 1 Zones for Demand Forecasting in Dar es Salaam

Table 1 Zone numbers for Demand Forecasting in Dar es Salaam

Zone			
Zone	No.	Municipal	Ward
1	101	Ilala	Buguruni
2	102	Ilala	Chanika
3	103	Ilala	Gerezani
4	104	Ilala	Gongolamboto
5	105	Ilala	Ilala
6	106	Ilala	Jangwani
7	107	Ilala	Kariakoo
8	108	Ilala	Kimanga
9	109	Ilala	Kinyerezi
10	110	Ilala	Kipawa
11	111	Ilala	Kisutu
12	112	Ilala	Kitunda
13	113	Ilala	Kivukoni
14	114	Ilala	Kivule
15	115	Ilala	Kiwalani
16	116	Ilala	Majohe
17	117	Ilala	Mchafukoge
18	118	Ilala	Mchikichini
19	119	Ilala	Msongola
20	120	Ilala	Pugu
21	121	Ilala	Segerea
22	122	Ilala	Tabata
23	123	Ilala	Ukongga
24	124	Ilala	Upanga Magharibi
25	125	Ilala	Upanga Mashariki
26	126	Ilala	Vingunguti
27	201	Temeke	Azimio
28	202	Temeke	Buza
29	203	Temeke	Chamazi
30	204	Temeke	Chang'ombe
31	205	Temeke	Charambe
32	206	Temeke	Keko
33	207	Temeke	Kiburugwa
34	208	Temeke	Kijichi
35	209	Temeke	Kilakala
36	210	Temeke	Kurasini
37	211	Temeke	Makangarawe
38	212	Temeke	Mbagala
39	213	Temeke	Mbagala Kuu
40	214	Temeke	Mianzini
41	215	Temeke	Miburani
42	216	Temeke	Mtoni
43	217	Temeke	Sandali
44	218	Temeke	Tandika
45	219	Temeke	Temeke
46	220	Temeke	Toangoma
47	221	Temeke	Yombo Vituka
48	301	Kinondoni	Bunju
49	302	Kinondoni	Hanasasifu
50	303	Kinondoni	Kawe
51	304	Kinondoni	Kigogo
52	305	Kinondoni	Kijitonyama
53	306	Kinondoni	Kinondoni
54	307	Kinondoni	Kunduchi
55	308	Kinondoni	Mabwepande
56	309	Kinondoni	Magomeni
57	310	Kinondoni	Makongo
58	311	Kinondoni	Makumbusho
59	312	Kinondoni	Mbezi juu
60	313	Kinondoni	Mbweni
61	314	Kinondoni	Mikocheni
62	315	Kinondoni	Msasani
63	316	Kinondoni	Mwananyamala
64	317	Kinondoni	Mzimuni
65	318	Kinondoni	Ndugumbi
66	319	Kinondoni	Tandale
67	320	Kinondoni	Wazo
68	401	Ubungo	Goba
69	402	Ubungo	Kibamba
70	403	Ubungo	Kimara
71	404	Ubungo	Kwembe
72	405	Ubungo	Mabibo
73	406	Ubungo	Makuburi
74	407	Ubungo	Makurumla
75	408	Ubungo	Manzese
76	409	Ubungo	Mbezi
77	410	Ubungo	Mburahati
78	411	Ubungo	Msigani
79	412	Ubungo	Saranga
80	413	Ubungo	Sinza
81	414	Ubungo	Ubungo
82	501	Kigamboni	Kigamboni
83	502	Kigamboni	Vijibweni
84	503	Kigamboni	Mjimwema
85	504	Kigamboni	Tungi
86	505	Kigamboni	Kibada
87	506	Kigamboni	Kisarawe II
88	507	Kigamboni	Kimbiji
89	508	Kigamboni	Pemba mnazi
90	509	Kigamboni	Somangila

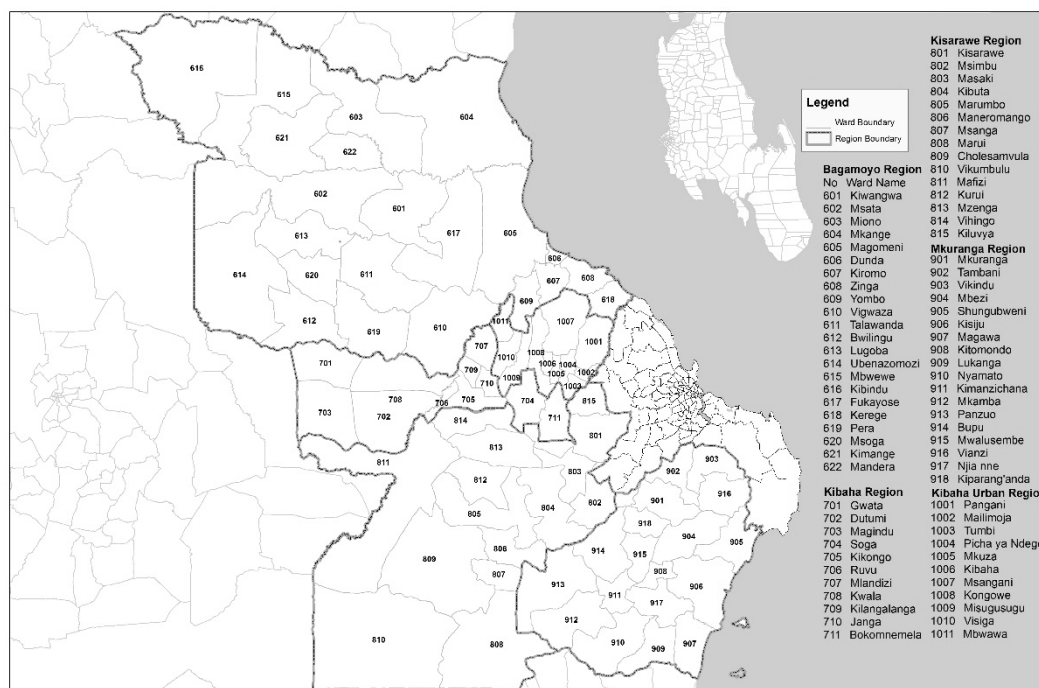


Figure 2 Zones for Demand Forecasting outside of Dar es Salaam

Table 2 Zone numbers for Demand Forecasting outside of Dar es Salaam

Zone				Zone				Zone			
Zone No.	No.	Region	Ward	Zone No.	No.	Region	Ward	Zone No.	No.	Region	Ward
91	601	Bagamoyo	Kiwangwa	117	705	Kibaha	Kikongo	143	905	Mkuranga	Shungubweni
92	602	Bagamoyo	Msata	118	706	Kibaha	Ruvu	144	906	Mkuranga	Kisiju
93	603	Bagamoyo	Miono	119	707	Kibaha	Mlandizi	145	907	Mkuranga	Magawa
94	604	Bagamoyo	Mkange	120	708	Kibaha	Kwala	146	908	Mkuranga	Kitomondo
95	605	Bagamoyo	Magomeni	121	709	Kibaha	Kilangalanga	147	909	Mkuranga	Lukanga
96	606	Bagamoyo	Dunda	122	710	Kibaha	Janga	148	910	Mkuranga	Nyamato
97	607	Bagamoyo	Kiromo	123	711	Kibaha	Bokomnemela	149	911	Mkuranga	Kimanzichana
98	608	Bagamoyo	Zinga	124	801	Kisarawe	Kisarawe	150	912	Mkuranga	Mkamba
99	609	Bagamoyo	Yombo	125	802	Kisarawe	Msimbu	151	913	Mkuranga	Panzuo
100	610	Bagamoyo	Vigwaza	126	803	Kisarawe	Masaki	152	914	Mkuranga	Bupu
101	611	Bagamoyo	Talawanda	127	804	Kisarawe	Kibuta	153	915	Mkuranga	Mwalusembe
102	612	Bagamoyo	Bwilingu	128	805	Kisarawe	Marumbo	154	916	Mkuranga	Vianzi
103	613	Bagamoyo	Lugoba	129	806	Kisarawe	Maneromango	155	917	Mkuranga	Njia nne
104	614	Bagamoyo	Ubenazomozzi	130	807	Kisarawe	Msanga	156	918	Mkuranga	Kiparang'anda
105	615	Bagamoyo	Mbwewe	131	808	Kisarawe	Marui	157	1001	Kibaha Urban	Pangani
106	616	Bagamoyo	Kibindu	132	809	Kisarawe	Cholesamvula	158	1002	Kibaha Urban	Mailimoja
107	617	Bagamoyo	Fukayose	133	810	Kisarawe	Vikumbulu	159	1003	Kibaha Urban	Tumbi
108	618	Bagamoyo	Kerege	134	811	Kisarawe	Mafizi	160	1004	Kibaha Urban	Picha ya Ndege
109	619	Bagamoyo	Pera	135	812	Kisarawe	Kurui	161	1005	Kibaha Urban	Mkuza
110	620	Bagamoyo	Msoga	136	813	Kisarawe	Mzenga	162	1006	Kibaha Urban	Kibaha
111	621	Bagamoyo	Kimange	137	814	Kisarawe	Vihingo	163	1007	Kibaha Urban	Msangani
112	622	Bagamoyo	Mandera	138	815	Kisarawe	Kiluvya	164	1008	Kibaha Urban	Kongowe
113	701	Kibaha	Gwata	139	901	Mkuranga	Mkuranga	165	1009	Kibaha Urban	Misugusugu
114	702	Kibaha	Dutumi	140	902	Mkuranga	Tambani	166	1010	Kibaha Urban	Visiga
115	703	Kibaha	Magindu	141	903	Mkuranga	Vikindu	167	1011	Kibaha Urban	Mbwawa
116	704	Kibaha	Soga	142	904	Mkuranga	Mbezi				

Zone			Zone			Zone		
Zone No.	No.	Region	Zone No.	No.	Region	Zone No.	No.	Region
168	2001	Tanga	179	2012	Mara	190	2023	Rukwa
169	2002	Morogoro	180	2013	Simiyu	191	3000	Kenya
170	2003	Lindi	181	2014	Singida	192	3100	Uganda
171	2004	Mtwara	182	2015	Mbeya	193	3200	Rwanda
172	2005	Ruvuma	183	2016	Tabora	194	3300	Burundi
173	2006	Njombe	184	2017	Shinyanga	195	3400	DR Congo
174	2007	Iringa	185	2018	Mwanza	196	3500	Zambia
175	2008	Dodoma	186	2019	Geita	197	3600	Malawi
176	2009	Manyara	187	2020	Kagera	198	3700	Mozambique
177	2010	Kilimanjaro	188	2021	Kigoma			
178	2011	Arusha	189	2022	Katavi			

[Public transit assignment]

- Input data

OD file (.csv)

- Output data

Assignment result file (.pdf)

Note: Data files for JICA STRADA don't exist for public transit assignment because the calculation isn't done by using JICA STRADA. The methodology for assignment is explained in Chapter 8.

“OD file” contains OD data of person trips which use public transit such as Bus, BRT and Rail. In each line, i zone, j zone, OD volume are included in this order. Relationship between zone number and zone is the same as Road traffic assignment case and it is shown in Figure 1, 2 and Table 1, 2.

**(2) File name and Folder structure**

Data files are stored in the same folder on each simulation cases. Simulation cases, file names and folder structure are summarised in the table below.

**Table 3 Simulation cases and Data files of Road traffic assignment**

Cases			Stored data				
Chapter	Target	Name of	Folder Name	Network file	Parameter file	OD	Assignment result
8	2017	Current	0_2017	roadnet_2017	par_2017	carOD_2017	result_2017
		Do-nothing	1_2040_DN	roadnet_2040_DN	par_DN	carOD_2040_DN	result_2040_DN
	2040	Alternative	2_2040_Alt	roadnet_2040_MP	par_MP	carOD_2040_Alt	result_2040_Alt
Master Plan		3_2040_MP	roadnet_2040_MP	par_MP	carOD_2040_MP	result_2040_MP	
11	2030	Do-nothing	4_2030_c11_c1	roadnet_2030_DN	par_DN	carOD_2030_c11_c1	result_2030_c11_c1
		BRT-only	5_2030_c11_c2	roadnet_2030_MP	par_MP	carOD_2030_c11_c2	result_2030_c11_c2
		Master Plan	6_2030_c11_c3	roadnet_2030_MP	par_MP	carOD_2030_c11_c3	result_2030_c11_c3
		Tegeta line	7_2030_c11_c4	roadnet_2030_MP	par_MP	carOD_2030_c11_c4	result_2030_c11_c4
		Morogoro	8_2030_c11_c5	roadnet_2030_MP	par_MP	carOD_2030_c11_c5	result_2030_c11_c5
13	2030	Loop line	9_2030_c13_c1	roadnet_2030_MP	par_MP	carOD_2030_c13_c1	result_2030_c13_c1
		Half loop &	10_2030_c13_c2	roadnet_2030_MP	par_MP	carOD_2030_c13_c2	result_2030_c13_c2
		Tegeta(1)	11_2030_c13_c3a	roadnet_2030_MP	par_MP	carOD_2030_c13_c3a	result_2030_c13_c3a
		Tegeta(2)	12_2030_c13_c3b	roadnet_2030_MP	par_MP	carOD_2030_c13_c3b	result_2030_c13_c3b
		Tegeta &	13_2030_c13_c4	roadnet_2030_MP	par_MP	carOD_2030_c13_c4	result_2030_c13_c4



**Table 4 Simulation cases and Data files of Public transit assignment**

Chapte	Target	Case	Stored data			
		Name of Case	Folder Name	OD	Rail Assignment result	BRT Assignment result
8	2040	Do-nothing Case	1_2040_DN	pubOD_2040_DN	result_2040_DN_Rail	result_2040_DN_BRT
		Alternative(BRT Only)	2_2040_Alt	pubOD_2040_Alt	result_2040_Alt_Rail	result_2040_Alt_BRT
		Master Plan Case	3_2040_MP	pubOD_2040_MP	result_2040_MP_Rail	result_2040_MP_BRT
11	2030	Do-nothing Case	4_2030_c11_c1	pubOD_2030_c11_c1	result_2030_c11_c1_Rail	result_2030_c11_c1_BRT
		BRT-only Case	5_2030_c11_c2	pubOD_2030_c11_c2	result_2030_c11_c2_Rail	result_2030_c11_c2_BRT
		Master Plan Case	6_2030_c11_c3	pubOD_2030_c11_c3	result_2030_c11_c3_Rail	result_2030_c11_c3_BRT
		Tegeta line Case	7_2030_c11_c4	pubOD_2030_c11_c4	result_2030_c11_c4_Rail	result_2030_c11_c4_BRT
		Morogoro line Case	8_2030_c11_c5	pubOD_2030_c11_c5	result_2030_c11_c5_Rail	result_2030_c11_c5_BRT
13	2030	Loop line Case	9_2030_c13_c1	pubOD_2030_c13_c1	result_2030_c13_c1_Rail	result_2030_c13_c1_BRT
		Half loop & Tegeta Case	10_2030_c13_c2	pubOD_2030_c13_c2	result_2030_c13_c2_Rail	result_2030_c13_c2_BRT
		Tegeta(1) Case	11_2030_c13_c3	pubOD_2030_c13_c3a	result_2030_c13_c3a_Rai	result_2030_c13_c3a_BR
		Tegeta(2) Case	12_2030_c13_c3	pubOD_2030_c13_c3b	result_2030_c13_c3b_Rai	result_2030_c13_c3b_BR
		Tegeta & Loop Case	13_2030_c13_c4	pubOD_2030_c13_c4	result_2030_c13_c4_Rail	result_2030_c13_c4_BRT



## **Annex-6: SEA and IEE Final Report**

### **(For Chapter-9)**

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- Annex 6-1: SEA Final Report
- Annex 6-2: IEE Final Report



● **Annex 6-1. SEA Final Report**

**UNITED REPUBLIC OF TANZANIA**



**PRESIDENT OFFICE – REGIONAL ADMINISTRATION AND LOCAL  
GOVERNMENTS**

**DAR ES SALAAM CITY COUNCIL**

**STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR UPDATING THE  
DAR ES SALAAM TRANSPORT MASTER PLAN**



**PREPARED BY  
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**May, 2018**

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Furthermore, our gratitude goes to staff that attended the national workshop for their variable contributions and ideas. PORALG believes that SEA is a process, it does not end with a report but rather the report is a compilation of suggestions in an orderly manner to help guide how to approach the planned development. The value of an SEA is not the report, but the outcome of that report- namely working towards sustainability. As such we are committed to uphold sustainability principles provided in this report. As Tanzania

moves towards industrialization and middle-income level, the need for reliable and affordable transport system in big cities such as Dar es Salaam becomes apparent. Implementing a Transport Master Plan such as this one will go a long way in ensuring Dar es Salaam achieves sustainable development and this report will help shape that path.

**To all those who made this work possible, we say THANK YOU VERY MUCH!**

## ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BRT	Bus Rapid Transit
CBD	Central Business District
CBOs	Community Based Organizations
CSG	Client Stakeholders Group
CO <sub>2</sub>	Carbon dioxide
CC	Carrying Capacity
DSM	Dar Es Salaam
DMRS	Dar es Salaam Marine Reserves System
DAWASA	Dar es Salaam Water and Sewerage Authority
DCC	Dar es Salaam City Council
DRC	Democratic Republic of Congo
DART	Dar es Salaam Rapid Transit Agency
DoE	Division of Environment
DUTA	Dar es Salaam Urban Transport Authority
DARTMP	Dar es Salaam Transport Master Plan
EIA	Environmental Impact Assessment
EMA	Environnemental Management Act
EMoP	Environmental Monitoring Plan
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESI	Electricity Supply Industry
EWURA	Energy and Water Utilities Regulatory Authority
FGD	Focus Group Discussion
FYDP	Five Year Development Plan
GHG	Green House Gases
GDP	Gross Domestic Product
HIV	Human Immune Virus
IFC	International Finance Corporation



IPP	Independent Power Producer
IRA	Institute of Resources Assessment
IRMP	Integrated Resource Management Plan
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency
KSG	Key Stakeholder Group
MRT	Mass Rapid Transit
MIRAI	Multifunctional, Inter-regional, Resilient, And Innovative.
MPRU	Marine Parks and Reserves Unit
MLHHSDD	Ministry of Land, Housing and Human Settlement Development
MoWI	Ministry of Water and Irrigation
NGOs	Non Governmental Organizations
NEMC	National Environment Management Council
NCTS	National Center for Transport Studies
NSGRP	National Strategy for Growth and Reduction of Poverty
OSHA	Occupational Safety and Health Authority
Pre-FS	Preliminary Feasibility Study
PO-RALG	President Office Regional Administration and Local Government
PSPF	Public Service Pension Fund
SEA	Strategic Environmental Assessment
SGR	Standard Gauge Rail
SUMATRA	Surface and Marine Transport Regulatory Authority
RAHCO	Railway Asset Holding Company
TPA	Tanzania Port Authority
TAT	Transporters Association of Tanzania
TAZARA	Tanzania –Zambia Railway
TACAIDS	Tanzania Commission for AIDS
TRL	Tanzania Railway Limited

TANROADs	Tanzania National Roads Agency
TATOA	Tanzania Truck Owners Association
ToR	Terms of References
LGRA	Local Government and Regional Administration
LAU	Limits of Acceptable Use/Change
TPDC	Tanzania Petroleum Development Corporation
URT	United Republic of Tanzania
UNFCCC	United Nations Framework Convention on Climate Change
UNESCO	United Nations Educational, Scientific and Cultural Organization
VPO	Vice President Office
WEO	Ward Executive Officer
WWF	World Wildlife Fund

## **EXECUTIVE SUMMARY**

### **Background**

The review of the DARTMP was carried out to address a number of transport, and infrastructures challenges that the Dar es Salaam city is facing. The First plan developed in 2008 was supposed to be reviewed after five years. Instead, this review comes nine years after establishment of the Master Plan. Furthermore, the planned objective to establish DUTA and NCTS to manage the transport system were not realized. Also, the Gerezani Area Transport Enhancement Project was not implemented while the TAZARA Intersection Improvement Project which was part of the priority intervention in 2008 objective one started late in 2017. The need for review of DARTMP was due to the fact that the 2008 was long overdue for review, considering the rapid increase of urban population and increasing transportation challenges in Dar es Salaam.

The revision of the DARTMP is influenced by the proposed Dar es Salaam Urban Structure and Land Use Plan, which designate the city into several structures that includes one CBD, Satellite Cities, Sub Centres and District Centres. In addition, there will be five Urban Corridors linking the CBD with Satellite cities, sub Centres and the adjacent districts of Mkuranga, Kisarawe, Kibaha and Bagamoyo. The Urban Structure will designate specific functions in each of the cities and centres to create a City which is safe, convenient, comfortable and resilient. This urban structure is the foundation of the Transport Master Plan in which several transport modes under the Master Plan are developed.

The proposed transport infrastructures that will be developed include the road plan, railway plan, public transport plan and traffic management plan. There will be several roads including expressway with 6 lanes; arterial (ring roads); trunk roads/BRT with 4 lanes; regional roads with 2 lanes; outer ring roads; middle ring roads and bay link road linking with Kigamboni. The roads will be developed in different parts of Dar es Salaam between 2025 and 2040. The Master Plan is promoting development of public transport system to create a shift from private vehicle use to public transport use mainly BRT, buses and Mass Rapid Transit (MRT) – railway system. This shift is aimed at addressing

the mobility, accessibility, punctuality, affordability, comfortability and safety challenges characterizing the current public transport system in Dar es Salaam.

### **The Objective of the Current DARTMP Review**

This review of the Dar es Salaam Urban Transport Master Plan is aiming at harmonizing the transport system and urban structures and is expected to take into account Population and Urban Structure Plan; Road Transport Plan; Public Transport Plan; as well as Traffic Management Plan. The public transport plan will be formulated in such a way that it will be easily accessible and cover the whole area of Dar es Salaam City. The public transport plan will constitute Mass Rapid Transit (MRT), Bus Rapid Transit (BRT), long distance busses (Express way) and other alternative major buses transport. Thus the main objective is to come up with the following:

- Effective integration of urban structure, road network, public transport network, and traffic management measures;
- Building sustainable urban structure through developing multimodal transport network and urban corridors between the central area and suburbs by TOD (Transit Oriented Development);
- Providing better public transport services with integrated public transport networks that facilitate movement within DSM within an hour;
- Establishing smart and intelligent traffic management systems to deal with congestion, traffic accidents and flooding problems; and
- Improving the quality of life in sustainability, mobility, accessibility, safety and comfortability.

### **The Objective of SEA**

This Strategic Environmental Assessment (SEA) is conducted in response to the requirement of Section 104 and 105 of the Environmental Management Act, 2004, the Strategic Environmental Assessment Regulations 2008 and SEA Guidelines of 2017. The Environmental Management Act directs that an SEA will be mandatory when responsible sectors are preparing policies, plans, programmes, and regulations and legislations. The

objectives of the SEA are provided in Part 11 Section 4 of the SEA Regulations published in G.N. # 153 of September 2008 but are adapted to suit this SEA as follows:

- Ensure that environmental concerns are thoroughly considered in the plan;
- Enable the public to contribute to the consideration of environmental concerns in the preparation of the plan;
- Establish clear, transparent and effective procedures for formulation of the plan;
- Integrate environmental concerns into measures and instruments designed to further sustainable development.

In addition to the above objectives, this SEA also covered the following issues:

- Provided opportunity for stakeholder engagement and participation in the development of the plan, taking into account matters of concern to them.
- Explored and suggested appropriate trade-offs between competing development goals and the possible need for compromise in reconciling them by drawing on “limits of acceptable use/change” principles to reinforce the SEA as a framework for long-term environmental and social management.
- Facilitated sustainability appraisal by evaluating environmental sustainability, and presenting its findings in a way that will facilitate an integrated sustainability analysis.

### **SEA Approach and Methodology**

The main SEA approach was to foster greater stakeholder participation and ensure that stakeholders have the opportunity to contribute ideas and suggestions to the proposed revision and express their concerns, which were integrated in the plan development process.

Thus this SEA combined several techniques and methodologies in data collection and analysis and was guided by a range of SEA principles including being integrated, fostering sustainability, being participatory, ensuring iterative and feed back to decision makers throughout the planning process. Key steps followed included literature review, stakeholder consultations through meetings, focus group discussions, interviews,

municipal workshops and national workshop. In addition and beside following Tanzania laws and processes, this SEA took into account JICA provisions on environmental mainstreaming in order to come up with environmentally, socially, politically, economically and technically acceptable transport master plan. Both the municipal and national workshops provided opportunities to various stakeholders to articulate their views and concerns regarding the proposed plan.

Some of these views included: the proposed infrastructure development would cross fragile areas such as flood prone areas, valleys and streams and may cause soil erosion. Other views are that the plan should be integrated with municipal plans; and that the plan will result in significant land take requiring compensations. Also, affected persons must be fully and fairly compensated, plans and local programmes should be synchronized, while institutional arrangement and coordination issues need attention and the plan should be extended to neighboring districts. Also, capacity on preparedness and monitoring is low and the plan should consider a long term visioning of 50 years instead of 30 years and it should be based on an approved Dar es Salaam Physical Master Plan. On the positive side, stakeholders noted that the new plan would address transportation challenges, create jobs, and improve businesses and industrialization programme in Dar es Salaam. These are some of the views that have been used to inform the planning process.

### **Proposed Alternatives**

Several alternatives were considered in the preparation of the DARTMP. Based on the urban structure, several transport alternative cases/scenarios were considered. *The Zero Case or “No Plan Alternative”*, is a continuation of the existing status quo, in which Dar es Salaam will remain with one CBD and four main roads; and on-going projects such as the expansion of the Morogoro road to six lanes, interchange at Ubungo and flyover at TAZARA junction. In addition, this scenario will continue with BRT phase 2 and 3 and the construction of the SGR railway from Dar es Salaam to Morogoro. This scenario will not solve Dar es Salaam problems in transportation and the environment but it provides the basis for monitoring of other scenarios that will be chosen.

The second alternative considered is *Case 1- the BRT Incentive Case*. This scenario continues with one CBD and introduces satellite cities and sub centers. The BRT network is expanded from phase 1 to Phase 6 and maintains the existing TAZARA and TRL rail services. Although this alternative relieves pressure from the CBD to the satellite cities, it will lead to more land take, compensation and resettlement, It will also lead to longer travel time with several stops, more green-house gas emissions due to having large numbers of BRT busses.

The third alternative is *Case 2- Railway Incentive Plan 1*. This scenario maintains the growth of the CBD, sub centers, satellite cities with BRT phase 2-6, and long distance trip roads. The plan expands railway development to service the outer ring covering various satellite cities and centers to a total of 155km of length. TAZARA and TRC existing lines will continue. This scenario has more extensive circular and radial system and will reduce greenhouse gas emissions due to having more railways running using electricity. However the option will involve development of several terminal stations leading to more land take and considerable cost in terms of compensation.

The fourth alternative is *Case 3 - Railway Incentive Plan 2. **This is the recommended alternative plan.*** This scenario maintains the CBD and sub centers and satellite cities, BRT network Phase 1-6 including middle ring route totaling 226 km. It also promotes longer railway network within circular Mass Rapid Transit (MRT) with possibility of extension to Bagamoyo and Morogoro totaling 105km with BRT Phase 2-6 developed on densely populated areas.

It is preferred because, in the long run, this scenario will be environmentally friendly and will meet mass rapid transport needs more efficiently. It will reduce pressure on the use of private vehicles. MRT and BRT will complement each other with BRT covering short distance routes to minimize congestion, traffic jams, provide convenience, comfort to passengers and timely travel time.

The Master Plan is proposing development of a Road plan that will involve construction of expressways with 6 lanes; arterial (Ring Roads); Trunk Road/BRT with 4 lanes; Regional Roads with 2 lanes; Outer Ring Roads; Middle Ring Roads and Bay link Road

linking with Kigamboni. Thus roads, flyovers and intersections will be built in key strategic areas in different parts of Dar es Salaam between 2025 and 2040.

### **Evaluation of Plan Alternatives**

Using a set of sustainability objectives embedded in the SEA process the evaluation of alternatives noted that the chosen alternative has both positive and negative effects. The main positive changes anticipated following the implementation of the plan would include:

- Enhancing socio-economic and welfare of the people
- Creating direct and indirect employment opportunities during construction and operation
- Improving transportation of people in Dar es Salaam
- Saving time, reducing cost and increasing efficiency in transportation
- Increasing productivity

Some of the negative effects of the proposed transport plan include:

- Leading to greater land acquisition and subsequent displacement of people, resulting to higher compensation cost
- Disruption of public social services and infrastructure
- Contribute to landscape change
- Increase energy demand and use (although it has been estimated that the required amount of 53MW will be available without much difficulty)
- Increasing the spread of HIV/AIDS and other sexually transmitted diseases
- Impact on archaeological, historical and cultural areas

Several mitigation options are proposed to addressing negative impacts.

### **Conclusion and Recommendations:**

The Strategic Environmental Assessment for the DARTMP has provided the environmental and social implications of implementing the recommended transport



master plan alternative and measures to mitigate the negative implications of the plan and enhance the positive ones. Unclear status of the Physical Urban Master Plan (the designation of satellite cities, centers and corridors) that has been used as the foundation for developing the Transport Master Plan is a matter of concern. While in practice, the integration of the recommended physical urban master plan with recommended transport master plan would complement each other and provide sustainable economic growth for the city of Dar es Salaam, there is urgent need to resolve its status and give it the legal backing it needs to be used as basis and foundation for the development of the Dar es Salaam City. Generally however, the recommended transport master plan is socially acceptable and environmentally viable.

The potential problems that still remain include: the integration of the preferred transport master plan with existing local government plans as highlighted in issues raised by stakeholders at Municipals and other government sector's level; sourcing and availability of financial resources to implement the plan on time, and implementing the proposed mitigation and enhancement measures so as to achieve social, environmental and economic sustainability of the plan. The low involvement of the private sector in developing this transport master plan is a huge challenge because it can undermine the timely availability of financial and technical resources needed to move the plan ahead. Considerations need to be made with regard to mitigation of cumulative and residual environmental impacts such as land acquisition, noise and increased population in Dar es Salaam.

Due to the nature of the plan itself, institutional coordination needs to be strengthened in terms of synchronizing planning of various activities related to DARTMP, with the transport master plan activities since the various projects under the transport master plan will be implemented by different sectors other than the DCC itself. Other challenges include inadequate skilled manpower, and lack of capacity to coordinate and mainstream environmental issues in the sector responsible for this SEA as directed by the Tanzania Environmental Management Act, 2004.

## **Recommendations**

To ensure efficient, sustainable and socially accepted transport system in Dar es Salaam is developed, the following specific recommendations are provided to the key responsible institutions to take action.

### **Recommendations to PORALG**

*(a) President's Office Regional Administration and Local Government and Ministry of Lands, Housing and Human Settlement Development will resolve the status of the Physical Urban Master Plan for Dar es Salaam*

The basis for developing the DARTMP has been the concept of the physical master plan of the Dar es Salaam city. PORALG and the Dar es Salaam City Council (DCC) shall align the updated DARTMP with the on-going review of the Dar es Salaam City Master Plan (2012-2032) and link it with other sector Master Plans such as Storm Water Drainage, Sewerage Water Supply, Power Distribution, Urban Tourism and Marine Transport Plans, which are also likely to have significant environmental effect.

*(b) President's Office Regional Administration and Local Government shall create an Institution that will coordinate and manage the Dare es Salaam Transport System.*

PORALG and the Dar es Salaam City Council (DCC) shall formulate a Dar es Salaam Metropolitan Authority in order to enhance the development of the Dar es Salaam city and create an institution that shall coordinate and manage transport infrastructure in Dar es Salaam and its neighbouring regions that are closely connected in terms of transport needs.

*(c) Dar es Salaam City Council in collaboration with the Ministry of Lands, Housing and Human Settlement and PORALG shall develop a Dar es Salaam Urban Development Policy*

Dar es Salaam City is growing very fast but albeit haphazardly, primarily due to among others, lack of a comprehensive urban policy. The development of transport infrastructure, which is spurred by the DSM physical master plan, is likely to trigger further expansion

and growth. To be able to manage that growth, an urban development policy shall be put in place and enforced.

***(d) President's Office Regional Administration and Local Government shall acquire land for the planned transport infrastructure well in advance.***

A major concern from various stakeholders in Municipal Council and National Workshop is the issue regarding early acquisition of land for the proposed transport infrastructure so as to ensure people are not investing in developments that will eventually have to be demolished when the implementation of the Transport Master plans starts.

***(e) President's Office Regional Administration and Local Government and Dar es Salaam City Council shall enhance institutional coordination and collaboration among key stakeholders for the implementation of the transport master plan.***

Implementation of DARTMP requires an effective institutional coordination among the various Government sectors and within the various sections and department of various sectors as well as with the local governments; private sector and NGOs in Dar es Salaam. PORALG and DCC shall endeavor to ensure institutional coordination between and among various stakeholders is in place.

***(f) President's Office Regional Administration and Local Government and DCC shall ensure funding for the transport infrastructure is available.***

The proposed transport master plan will require significant investment and therefore, the PORALG and DCC shall ensure that funding for the planned development is available so that plans are realized. PORALG shall need to engage the Ministry of Finance and Economic Development to initiate the process of resource mobilization both from within and outside sources.

***(g). President's Office Regional Administration and Local Government and DCC shall promote Public Private Partnership (PPP) for the implementation of the proposed DARTMP.***

Adopting a Public Private Partnership (PPP) in the implementation of DARTMP activities is key to unlocking financial limitation challenges. PORALG and DCC shall promote PPP in construction, operation and running of some activities planned under DARTMP.

***(h) President's Office Regional Administration and Local Government and DCC shall ensure detailed ESIA's are undertaken for various projects under the DARTMP.***

The proposed transport alternative that will be developed will result in several specific projects (e.g. road projects, railway projects, flyover/intersections etc) that have to be subjected to detailed ESIA to comprehensively identify their environmental, social and economic impacts and suggest mitigation/enhancement measures.

#### **Recommendations to JICA Study Team**

***(a) JICA Study team shall accommodate into the Transport Master Plan, TANROAD plans for the construction of 8 intersections.***

JICA Study team shall integrate and harmonize into the proposed Transport Master Plan TANROADs' 8 intersections planned to be developed in Dar es Salaam as per TANROADS completion schedule of 2025.

***(b) JICA Study team shall accommodate into the Transport Master Plan, DART's Plans for the Phase 6 of Bus Rapid Transit (BRT).***

DART, which is managing the Bus Rapid Transit Services and infrastructure has plans to construct BRT Phase 6 from Morocco to Tegeta. This plan is not included in the proposed routes for BRT services in the proposed Transport Master Plan. This aspect needs to be harmonized and included in the plan as part of broader strategy so that work under DART is integrated with the rest of the plans.

***(c) JICA Study team shall address the issue of freight of cargo inside Dar es Salaam.***

The proposed Transport Master Plan is focusing more on transportation of passengers and people but says little about freight of cargo inside Dar es Salaam and how this activity is linked to the proposed transportation systems. The proposed Transport Master Plan thus, should reflect these aspects in the proposed Transport Master Plan.

***(d) JICA Study team shall propose appropriate technology in the transport system***

Use of appropriate technology in the proposed transport master plan will minimize impacts such as size of land to be taken, pollution etc. Therefore, JICA study team should promote the use of such technologies including design solution and clean energy to reduce air pollution.

#### **Recommendation to Dar es Salaam Municipal Councils**

***(a) Councils shall intensify sensitization efforts to the communities***

Dar es Salaam Municipal Councils shall embark on an aggressive awareness-raising program using all available means of communication to sensitize people about the planned Transport Master Plan and proposed measures. Awareness and knowledge of what is intended is very low and this has implications in terms of support to the policy and buy in from the stakeholders that will be either positively or negatively impacted by the plan. This will be done by the Municipal Councils or by their consultants.

***(b) Councils shall address the issue of school going children***

Dar es Salaam is facing a serious problem of school going children, having no clear or effective policy on how school children can access and use public transport. A number of measures have been tried in the past but still large groups of children are seen in the morning and evening stranded at bus stops. This is an administrative matter that the Municipal Councils shall address and be part of the overall transport master plan.

## **1.0 BACKGROUND TO THE DAR ES SALAAM TRANSPORT MASTER PLAN**

### **1.1 Brief description of the DARTMP**

The first Dar es Salaam Transport Master Plan (DARTMP), the “Dar es Salaam Transport Policy and System Development Master Plan” was prepared in 2007/8. The overall goal was to formulate Transportation Policy and System Development Master Plan with the target year of 2030. The Master Plan was prepared to meet two short-term objectives namely: (a) To formulate short term action plans to alleviate traffic congestion problems in the City and prepare preliminary feasibility study for the selected two priority projects namely, Gerezani Area Transport Enhancement Project, and TAZARA Intersection Improvement Project; (b) To prepare a Capacity Development Plan in order to alleviate traffic congestion problems in the City and to assure effective implementation of the proposed two priority projects in a sustainable manner. It also included establishment of the National Center for Transport Studies (NCTS) in order to assure effective implementation of the proposed projects, and developing an Authority called Dar es Salaam Urban Transport Authority (DUTA) in order to implement the proposed projects in a sustainable manner as well as to be responsible for overall transport development issues in Dar es Salaam City. The need for review of DARTMP was due to the fact that the 2008 was long overdue (it was to be reviewed every after 5 years), rapid increases of urban population and increasing transportation challenges in Dar es Salaam.

The revision of the DARTMP is influenced by the proposed Dar es Salaam Urban Structure and Land Use Plan, which designate the city into several structures that includes one CBD, and Satellite Cities at Bunju, Luguruni, Mbezi, Tegeta, Pugu, Ukonga and Mbagala. Others are Sub Centres at Morocco, Ubungo, Mwenge, and TAZARA; District Centres at Kigamboni and Temeke. In addition, there will be five Urban Corridors linking the CBD with Kigamboni, Mkuranga, Gongo la Mboto, Kibaha and Bagamoyo. The Urban Structure will designate specific functions in each of the cities and centres to create a City which is safe, convenient, comfortable and resilient. This urban structure is the foundation of the Transport Master Plan in which several transport modes will be developed.

The proposed transport infrastructure that will be developed include a Road plan. There will be several roads including expressway with 6 lanes; arterial (Ring Roads); Trunk Road/BRT with 4 lanes; Regional Roads with 2 lanes; Outer Ring Roads; Middle Ring Roads and Bay link Road linking with Kigamboni. The roads will be developed in different parts of Dar es Salaam between 2025 and 2040. The Master Plan is promoting development of public transport system to create a shift from private vehicle use to public transport use. The public transport will include BRT, buses and Mass Rapid Transit (MRT) – railway system. The The Plan for the Public Transport is aimed at addressing the following challenges:

- Mobility - average travel speed is limited by congestion and condition of roads;
- Accessibility – Not all areas are connected with public transport;
- Punctuality/Reliability- *Daladala* drivers may wait for buses to be full;
- Affordability – Public transport is cheaper than private drive;
- Comfortability – Crowded buses including BRT;
- Safety- accidents and floods.

Under the BRT plan, the strategy is to develop it in phases as follows:

- Phase 1: extension to cover Morogoro –Kimara and Mbezi before 2025
- Phase 2 & 3: – Kilwa – Nyerere Rd – before 2020
- Phase 4: – Bagamoyo Rd – Sam Nujoma Rd – before 2022
- Phase 5: Nelson Mandela Rd – before 2030
- Phase 6: Old Bagamoyo Rd - before 2030
- Phase 7: Kigamboni – (Proposed) - before 2040

The MRT - Railway plan will also be developed in stages and in different parts of the city according to the physical condition of the area. For example, it is proposed that the Railway plan will involve building of railway structures on the grade section (on the ground), or using viaduct section and also underground sections. The railway wagons will take more passengers and reduce pressure on road transport. The Master Plan notes several issues related to the development of the railway plan that includes the following:

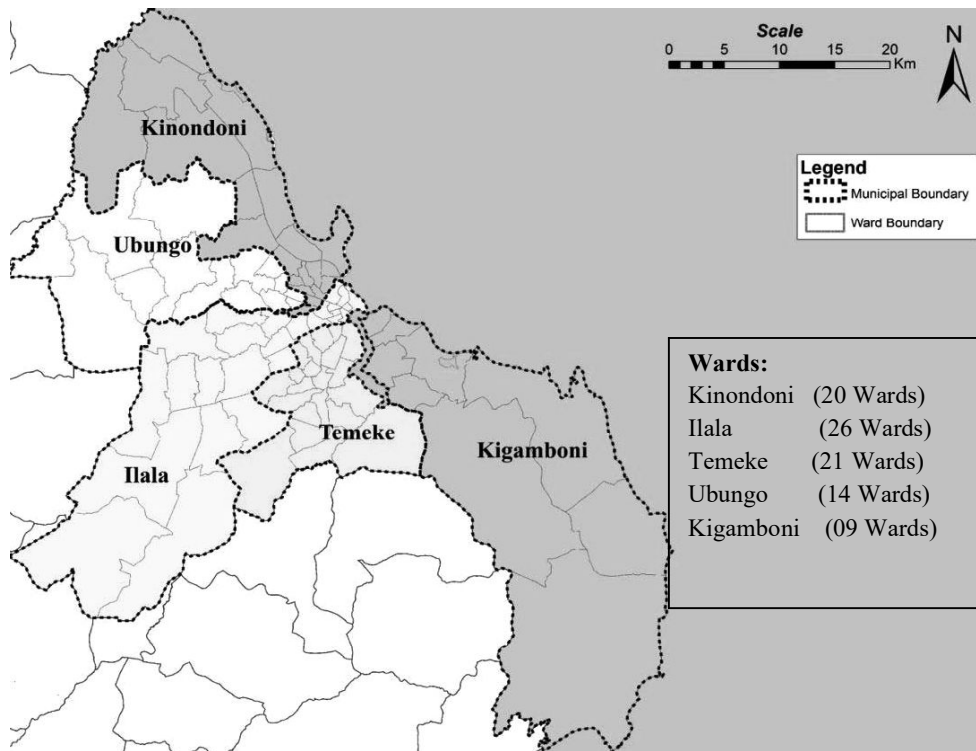
- Around Ubungo Bus Terminal - Flyover must be built over Morogoro Road and some houses will be demolished;
- Mwenge Intersection – Sharp curve will be requiring and housing structure will be removed;
- Transition Section at Golf Course (Gymkhana Ground) will require land take;
- Land for depot approximately 10 ha is needed;
- Electrical demand for running the railway system – approximately a total 53 MW will be needed between 2025 and 2040. TANESCO can deliver 4,000MW by 2022 so electricity availability will not be an issue;
- Operational Organization – TRL to run the system but later a new firm to run it shall be created;

Other issue: land for Terminal buildings - Primary, Secondary, Tertiary, Bus Terminals and Inter City Bus Terminals.

## **1.2 Dar es Salaam City and Transport Issues**

Dar es Salaam is the commercial and the largest city in Tanzania that consists of five municipalities and ninety wards. The Municipalities are Kinondoni, Ilala, Temeke, Ubungo and Kigamboni. The commercial city provides access to the landlocked countries of Uganda, Rwanda, Burundi, Democratic Republic of Congo (DRC), Zambia and Malawi. The following figure shows the location of the five Municipalities.





**Map 1: Location of Five Municipalities in Dar es Salaam City**

Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

The main transportation issues in Dar es Salaam include:

- **Increased Urban Population and Poor Public Transport**

According to the Tanzania National Bureau of Statistics, 2012, the Dar es Salaam urban population in the year 2012 was 4.3 million people. Based on the UN World Urbanization prospects, the projection of Dar es Salaam for the year 2030 is expected to increase to be over 10 million people. With an area of 1,393 km<sup>2</sup> Population density was 3,087 person/km<sup>2</sup> in 2012 that is expected to increase up to more than 7,178 person/km<sup>2</sup> in 2030. However, public transport in Dar es Salaam that mostly depends on local transport locally known as *Daladala*, introduction of Bus Rapid Transit (BRT) along Morogoro Road cannot accommodate the increased urban population. This is manifested by overcrowd in bus stops and in the buses.

Despite of the existing plans to introduce BRT along Nyerere Road, Kilwa Road and Bagamoyo Road, the BRT cannot accommodate the expected 10 million people in year 2030 due to the limited capacity of BRT compared to Mass Rapid Transit (MRT) that is railway transport network. Thus an MRT system is to be introduced in Dar es Salaam City.



**Plate 1: BRT in Dar es Salaam City, 2017**

Source: *JICA 2017. The Project for Revision of Dar es Salaam Transport Master in URT*



**Plate 2: Expected MRT in Dar es Salaam City**

Source: *JICA 2017. The Project for Revision of Dar es Salaam Transport Master in URT*

- **Increased Car Ownership and Poor Infrastructure**

Car ownership increased from 80,000 in the year 2007 to 200,000 vehicles in the year 2014 with annual growth of 14%. This annual growth rate exceeds the 8.4% that was estimated by the current (2008) Dar es Salaam Transport Master Plan. However, the increased car ownership is not supported by the structure of road network. Furthermore, Dar es Salaam has 2,170 km of roads of which only 411 km (19%) are in good condition. Storm water drains are inadequate and more than 50% of them are in poor condition. Any

heavy rain in Dar es Salaam causes serious transport challenges and destroys infrastructure.

Due to inadequate structure of road network to cope up with the increased car ownership, most of the trips take place along the trunk roads (Morogoro Road, Nyerere Road, Kilwa Road and Bagamoyo Road) to the City Centre. Furthermore, lack of sufficient ring roads and collector roads, there is high traffic volume causing congestion, especially during the morning and evening peak hours in the radial trunk roads.



**Plate 3: Poor drainage system caused the flooding of Morogoro trunk road in 2017**

Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

- **Lack of Sustainable Urban Structure and Increased Traffic Congestion**

Dar es Salaam City has only one Central Business District (CBD) with no Satellite Cities and Sub Centers. Due to the lack of Satellite Cities and Sub Centers, as well as poor road network, the City is accompanied with urban sprawl along the radial trunk roads. Furthermore, disorder housing development in unplanned settlements that accounts to

more than 70% of the urban residential areas make difficult improvement of road network and provide better public transport service.

Consequently, and as the City depends from only one CBD, the radial trunk roads are always accompanied with traffic congestions and traffic jam especially during peak hours in the morning and evening heading to or from the CBD. Traffic congestion and traffic jams cause delays, occasions, serious health problems due to increased emission of carbon dioxide (CO<sub>2</sub>), stress, noise pollution, accidents and economic loss. Also disorder housing development makes difficult disaster risk prevention and natural environment preservation thorough SEA.



**Plate 4: Traffic congestion in the CBD, 2017**

Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

### **1.3 Rationale of the DARTMP**

Dar es Salaam City Council is planning to update the Dar es Salaam Transport Master Plan with the aim of improving the transport system, economic development, environmental condition as well as human health. Dar es Salaam is one of the world's fastest growing cities, and it has reached its tipping point. The City is now chocked with increasing and expanding urban transportation challenges that have caused not only huge economic losses but also environmental, social, health, safety and security risks. While

transportation challenges have been increasing in Dar es Salaam, the city has been expanding in terms of administrative divisions, population and settlement compared to 2008 situation.

The increasing urban transport challenges have necessitated a review of the existing Urban Transport master Plan of 2008 that was prepared by JICA and has been ineffectively implemented. Among the projects proposed in the current Master Plan that was prepared in 2008 include; TAZARA Junction Fly-over Project, and the New Bagamoyo Road Widening Project, both of which have been initiated using Japanese Grant Aid. EU finances the Nelson Mandela Road Widening Project; the Bus Rapid Transit (BRT) Project by the World Bank, and the Kigamboni Bridge Project by the Social Security Fund of Tanzania have been launched based on the current Master Plan.

DSM is the main entry point for the transport corridor to the land locked countries such as Zambia, Burundi, Rwanda, and Uganda. It is also an important hub for the logistics. The current traffic issues in DSM affect the economic development of Tanzania, as well as that of neighboring hinterland countries. Under these circumstances, both the Governments of Tanzania and Japan have agreed to launch the Project on the revision of the DSM Transport Master Plan.

#### **1.4 The aim of Dar es Salaam Transport Master Plan**

To overcome the existing challenges in transport system in Dar es Salaam city, there is a need to develop a transport master plan for the city. The first Dar es Salaam Urban Transport Master Plan (DARTMP) was prepared in 2007/8. The overall goal was to formulate Transportation Policy and System Development Master Plan with the target year of 2034. The short-term objectives were to formulate action plans to alleviate traffic congestion problems in the City and prepare preliminary feasibility study (Pre-FS) for the selected priority projects. It also included establishing the National Center for Transport Studies (NCTS) in order to assure effective implementation of the proposed projects, and developing an Authority called Dar es Salaam Urban Transport Authority (DUTA) in

order to implement the proposed projects in a sustainable and responsible manner for overall transport development issues in Dar es Salaam City.

Since the 2007/08 the transport master plan has not achieved the short term objectives and targets set, there was a need to update the master plan to accommodate new development challenges and targets. Thus the 2017 update of the Dar es Salaam Urban Transport Master Plan is aiming at harmonizing transport system and urban structures. It is expected to take into account Population and Urban Structure Plan; Road Transport Plan; Public Transport Plan; as well as Traffic Management Plan. The public transport plan will be formulated in such a way that it will be easily accessible and cover the whole area of Dar es Salaam City. The public transport plan will constitute Mass Rapid Transit (MRT), Bus Rapid Transit (BRT), long distance busses (Express way) and other alternative major buses transport. The main objective is to come up with.

- i. Effective integration of urban structure, road network, public transport network, and traffic management measures;
- ii. Building sustainable urban structure through developing multimodal transport network and urban corridors between the central area and suburbs by TOD (Transit Oriented Development);
- iii. Providing better public transport services with integrated public transport networks that facilitate movement within DSM within an hour;
- iv. Establishing smart and intelligent traffic management systems to deal with congestion, traffic accident and flooding problems; and
- v. Improving the quality of life in terms of sustainability, mobility, accessibility, safety and comfort.

### **1.5 Objectives of the Dar Es Salam Transport Master Plan**

Dar es Salaam transport network has been designed based on the setup of the city. The city has one CBD where major economic activities and several social services are centered; this has resulted into concentration and direction of all transport networks

toward this area. The government through TANROADS and local governments have been putting more effort on the transport network around CBD. Currently 98% of road network and roadside facilities in CBD are paved (JICA 2017). In suburb areas transport networks are not well planned and are in poor condition. There are only four (4) major road transport networks linking the CBD to the suburb; these are; Bagamoyo road, Morogoro road, Nyerere road and Kilwa road. These links are supported by major ring roads such as Kawawa road, Nelson Mandela road, Bibi Titi road Sam Nujuma Roads and others.

There are two railway transport networks (commuter trains) operated by TAZARA and TRL, which support the available road transport network. TRL main line section is between Central Railway Station and Pugu Station (20 km). There is also the TRL branch line section between Central Railway Station and Ubungo (11.7 km). TAZARA on the other hand is operating commuter trains about 18 km between TAZARA Railway Station and Mwakanga Station.

With regard to waterways; two systems are operating currently in DSM. One is a shuttle service between Kivukoni and Kigamboni, while the other is the middle-distance ferry between DSM and Zanzibar.

Challenges of transport system in Dar es Salaam are mainly related to road traffic congestion, low road network density, frequent flooding of roads in the rainy season as well as poor transport management for efficient and safe traffic movement.

- *Serious road traffic congestion of trunk roads in urban area during peak hours*

To deal with these problems in DSM where traffic is likely to continue increasing in the future, not only supply side measures but also demand side ones need to be implemented efficiently and effectively. In order to improve road congestion, public transport or mass transport systems should be aggressively introduced more to promote public transport use in the long term. Recently, transport in DSM has been changing in modal split since a

new public transport system (BRT) began to be operated by the DART on the 10th of May 2016. It seems that BRT is efficiently operated and effectively used by the Dar residents between CBD and suburbs. In addition, Commuter trains on the three routes operated by TRL and TAZARA have also been used efficiently despite the limited operations during morning and evening peak hours. Both public transport systems can be said to be very successful in that they provide more stable and more rapid mobility than bus, taxi, car and motorcycle. The number of users of both systems is assumed to be increasing gradually. This is attributed to not only their level of service but also the heavily congested roads in the urban areas of DSM. For example, if people use BRT between CBD and Ubungu, it takes approximately 30 minutes while cars take at least one hour during peak hours.

Therefore it is clearly recognized by people that public transport like BRT or Commuter train is seen as an indispensable system and hence the potential for the valuable mode to be enhanced more in DSM in the future. However, the issues at this point are when, what and how public transport networks are strengthened from the view of catching up the rapid increasing demand of transport in the city.

- *Low road network density and bus network especially in the suburb*

The road network should be improved with higher density suitable for urban traffic movement and bus service especially in the suburb. Urban sprawl and housing development are scattered in the whole area of DSM without development control. There are increasingly poor urbanized areas especially along Nyerere Road and Kilwa road. This issue should be tackled from the view of both road provision by road transport sector and development control by land use control sector.

- *Frequent Flooding of roads in urban area in the rainy season*

Flooding leads to risks of traffic accident and congestion. Congestion, accident and flooding can be seen as the three major road problems in urban DSM. All the three problems often happen at the same time at intersections. The issues should be dealt with as an urgent problem particularly in CBD.



- *Mixture of cargo and passenger transport on same trunk roads to the port*

As one of the major ports in East Africa, DSM port is likely to deal with more freight in the future, not only for Tanzania's economy but also of the neighboring inland countries. Port towns like DSM are facing the difficulty of separating logistic transport with passenger transport on same trunk roads access to DSM port. This issue in DSM should be examined based on the traffic survey analysis as well as in the new port development in Bagamoyo.

Similarly there are other problems the city experiences like:

- **Poor waste management:** There are no proper waste bins along the roads and streets in the CBD and suburbs and hence poor waste management systems;
- **High levels of fuel consumption:** Spending a lot of time per unit distance during peak hours due to traffic congestion results into the use of more fuel than normal and therefore increasing the cost of transport within the city;
- **High risk of spreading of communicable diseases:** Existing public transport whereby especially *daladala* carrying more passengers than their carrying capacity while having poorly ventilated environments within highly congested traffic.

### 1.6 Objective of the SEA

The relationship and linkages that exist between people, natural resources and the economy of Dar es Salaam Region are all part of the environment. Therefore, the goals of economic and social development must be defined in terms of sustainability i.e. integration of biophysical, economic and social objectives (WSSD, 2002). The SEA is a requirement of Environmental Management Act of 2004 and the Strategic Environmental Assessment Regulations 2008 for any development of Plan, Programme and Policy. Dar es Salaam City Council is planning to update its Dar es Salaam Transport Master Plan to be extended to 2040 however; there are fears that such a development plan and targets could pose threats to future well being of local populations and on natural resources. Thus, the PO-RALG (DCC) is undertaking Strategic Environmental Assessment (SEA) to ensure that planned development targets avoid or reduce negative social, economic and

environmental impacts. The SEA process and its outputs are expected to contribute and add value to the review of regional development targets.

The overall objective of this SEA is to ensure that social, economic and biological/ecological considerations are fully integrated into the proposed DARTMP. Given the potential trade-offs between competing development goals and the possible need for compromise in reconciling them. Accordingly therefore, the proposed SEA process informs and involves Municipal planners, decision/policy - makers and the general public on decision making processes that fosters sustainable development, facilitates the search for the best alternatives (options) and ensures a democratic decision-making process. The idea is to enhance the credibility of decisions, leading to more cost- and time effective environmental assessments at the project level.

Therefore, the purpose of this SEA is to:

- i. Present relevant environmental baseline information, including a review of the proposed plan;
- i. Identify, describe and assess the likely significant environmental effects associated with the proposed DARTMP;
- ii. Propose measures to avoid, reduce and/or offset any potentially significant adverse effects and, where appropriate, to enhance any potential positive effects from the plan;
- iii. Outline and describe the measures envisaged for monitoring any significant effects identified by the SEA; and
- iv. Demonstrate that the DARTMP has been developed in a manner consistent with the requirements of the Tanzanian SEA Regulations (2008).

### **1.7 Overview of SEA Report**

This report is structured to follow national SEA guidelines with regard to report with some adjustments intended to provide more logical flow to the reader. After acknowledgement, acronyms, the report provide an executive summary highlighting key master plan proposal, issues, and mitigation and monitoring requirements. The report

then turns into main chapters starting with Chapter One which is Background to the Dar es Salaam Transport Master Plan (DARTMP), indicating few salient features of the current Master Plan, description of the Dar es Salaam City, Rationale for DARTMP, its Objectives, the aim for the DARTMP; Objective of the Strategic Environmental Assessment (SEA) thus setting the stage for understanding the need for the revision and the current report. Chapter Two is about the approach and methodology followed in this SEA while chapter three is about stakeholder consultations and participation.

Stakeholder engagement is a critical component of the SEA process and in this chapter; issues and concerns raised by stakeholders are clearly presented and used in subsequent chapters. Chapter Four presents a discussion of relevant policies, laws, institutional framework and international conventions that are relevant to the proposed Plan and which have to be taken into account. Chapter Five discusses the current baseline condition for Dar es Salaam City and Chapter Six discusses in general the alternatives and transport scenarios that have been considered and zeros down to the proposed alternative by the plan developers to subject it to detailed assessment.

Chapter Seven is about the environmental mitigation measures. Chapter eight brings the issue of monitoring of the impact of the plan implementation and highlights the need for clear institutional arrangement, and capacity development to ensure impact are implemented and monitored for the purpose of building foundation of knowledge and information that can inform future planning, Chapter nine cover analysis of uncertainties. Chapter Ten provides conclusion and recommendations that is followed by references and annexes to the report.

## **2.0 APPROACH AND METHODOLOGY FOR THIS SEA**

### **2.1 Approach to the SEA**

The proposed SEA approach is to inform and involve relevant stakeholders i.e. planners, decision-makers and the general public on decision-making processes on the proposed Dar es Salaam transport master plan aiming at harmonizing transport system and urban structures. It is expected to take into account Population and Urban Structure Plan; Road Transport Plan; Public Transport Plan; as well as Traffic Management Plan. The overall target of SEA approach is to foster sustainable development, facilitates the search for the best alternatives and ensures a democratic decision-making process. The idea is to enhance the credibility of decisions, leading to more cost-and time effective environmental assessments later at the project level.

In this particular study, both the impact – centered and institution-centered SEA approaches were employed, whereby the focus of assessment was on both the physical and human impacts of the proposed Dar es Salaam transport master plan as well as assessing the complex interactions between political, social and environmental factors constituting the proposed Dar es Salaam Transport Master Plan were taken into consideration.

In order to successfully integrate key environmental issues in plan (like DARTMP), policies and programmes, the World Bank (2005) notes that it is vital to put particular focus on the role of institutions while performing SEA. More specifically, the Institutional-centered approach calls for creation of a dialogue among all relevant stakeholders to discuss the environmental issues relevant to the proposed Dar es Salaam Urban Transport Master Plan. This approach also involves environmental priority setting whereby the legitimate stakeholders are invited to react to the situation analysis, raise specific and relevant environmental priority concerns and choose the SEA priorities taking into account the strengths, weaknesses, constraints, and opportunities of the institutions associated with the particular plan, policy or programme.

Analysis of alternatives in this context, refer to consideration of different ways of meeting the objectives of the proposed plan. In this SEA, alternatives were based on: (i) the existing policies, legal and institutional frameworks; (ii) the existing baseline characteristics; (iii) stakeholders' views, local knowledge and information on the initial planning concept for the development of the City of Dar es Salaam and initial designs from the engineers.

This SEA looked at the proposed urban development structure and how the projected or preferred urban structure is linked in terms of transport to move people and goods in a more efficient, comfortable, cheap, convenient and safe way. The project mode of transport in relation to projected urban growth structures is to meet the projected and foreseen demand for short term, midterm and long term. The approach in the model of development is focusing on transport mix model where a combination of various transport modalities covering BRT, MRT and Long distance busses in operating as express way to serve long distance satellite cities. These scenarios are examined in terms of transport model, cost, scale of operation in terms of number of people served per time, environmental implications of developing the proposed transport mix model level of waste generated, pollution particularly greenhouse gases from emission levels where the viable projects /scenario options are implemented, as well as social costs in terms of land take, compensation and disturbances to local communities.

## **2.2 Methodology**

Accordingly, this SEA engaged a combination of techniques and methodologies in data collection and analysis, and followed standard procedures and steps. The SEA process applied SEA principles that included:

*The Integration principle:* In this master plan, efforts were made to ensure environmental assessment of all development targets relevant for the achievement of sustainable development, in the areas earmarked for infrastructure development under the proposed master plan were taken into account through review of municipal, regional and national development plans and programmes that might contribute to environmental threats or

interfere or conflict with the proposed master plan. By integrating all those plans and programme into the analysis of environmental threats of the proposed development, it was possible to identify issues of concern that will need the attention of the decision makers for this proposed Dar es Salaam Transport Master Plan. For example, the issue about satellite cities and sub centers proposed in the master plan relative to the existing planned centers by the respective municipal councils. The need for integrating those various plans with the Dar es Salaam Transport Master Plan is crucial for this SEA.

*The Sustainability principle:* to ensure facilitation of identification of different options and alternatives that ensure sustainability, by concentrating on key issues of sustainable development, ensuring cost-and time effectiveness. For example, in this Dar es Salaam Transport Master Plan, key issues such as the availability and suitability of fund to finance the massive infrastructure development under the master plan, land, and compensation issues have to be taken into account.

*The Participatory principle:* to ensure that the planning process informs and involves affected public, private sector and government agencies throughout the decision-making process and explicitly addresses their inputs and concerns in decision-making and documentation. In this Dar es Salaam Transport Master Plan, stakeholder participation has been the main approach through general meetings, focus group discussions, interviews and field visits all aimed at ensuring that stakeholders become part of the programme development process; and

*The Iterative principle:* to ensure availability of the assessment results early enough to influence the planning and decision-making processes and provide information on the actual impacts of implementing a decision/target, and judge whether or not it should be amended and provide a basis for future decisions.

## **2.2 Methodology in Data Collection**

The main stages for the SEA methodology are as follows:

### **2.2.1 Literature review**

To address the identified objectives, a preliminary review of the available information on the proposed Dar es Salaam Transport Master Plan and related literature, including legislations and national policies was undertaken. The review helped to identify areas where further information would be needed in order to focus the SEA in general. Furthermore, the review helped to identify stakeholders and pertinent issues related to the proposed Dar es Salaam transport master plan.

The detailed review focused on existing and planned development by respective municipal councils, social characteristics, ecological and archaeological aspects of the five municipals and requirements of SEA as per Environmental Management Act of 2004 and National SEA Guideline (2016), JICA Guidelines for Environmental and Social Considerations (2010) and IFC Guideline. The review was also useful in assisting to describe the current baseline conditions of the area where the Master plan will be implemented. The review considered the current infrastructure as well as environmental characteristics, population characteristics on planned road and railway corridors and identification of anticipated magnitude of resettlement. In addition, information on the current socio-economic environment within the core program area and area of influence were reviewed to provide baseline data.

### **2.2.2 Stakeholders' engagement**

The initial stage in undertaking SEA was to carry out a preliminary identification of stakeholders and Scoping of issues of interest to the proposed DARTMP. From the study a scoping of issues was done to set the context, objectives, legal and administrative /infrastructural frameworks; establish preliminary baseline condition of the study area; identify alternatives to the proposed plan; and decide on the planning scope in consultation with the statutory SEA bodies including the VPO. Apart from the list of stakeholders identified, the most significant output of the scoping exercise was the updated strategic development targets and terms of reference which guided the comprehensive SEA study

Stakeholder's engagement is a key to undertaking SEA study. In this Dar es Salaam Transport Master Plan, stakeholders involvement includes: Dar es Salaam city council; five municipal councils forming the Dar es Salaam City; government institutions responsible for transport i.e. Railway Asset Holding Company (RAHCO), Surface and Marine Transport Regulatory Authority (SUMATRA), Tanzania Port Authority (TPA), Tanzania Roads Agency (TANROADS), Tanzania–Zambia Railway (TAZARA); ministries responsible for transportation as well as of finance and planning. Other stakeholders consulted are technical staff of the municipal councils and councilors representing all wards where the proposed master plan will be implemented. Consultations aimed at obtaining views and concerns on the proposed plan, urban structure, transport options/ scenarios, development alternatives to the plan, and the boundaries with which the plan interacts. Views and concerns and list of stakeholders consulted is appended in Annex 12.2 and 12.3 respectively

### **2.2.3 Site visit**

Site visits to transportation (road and rail) routes in the City were undertaken for the purpose of gathering relevant information for this SEA. The site visits enabled the team to plan for undertaking comprehensive assessment of the biophysical and socio-economic characteristics of the routes and identify issues (i.e. topographical, biological, ecological, physical, social and economic issues) that are likely to be unique for each route and those that would be common to all, that will emerge from development of the proposed plan in all municipal councils constituting the master plan.



### **3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK**

#### **3.1 Policy Framework**

The proposed Urban Transport Master Plan in Dar es Salaam will have implications on several national policies, laws and international policies that relate to the master plan. Administratively, the proposed development falls under the president office Regional Administration and Local Government as the focal point for local government as the master plan is under Dar es Salaam City Council (DCC). Also, several other ministries and institutions will have direct and indirect links with the proposed master plan. These include the Ministry of Lands, Housing and Human Settlement Development, Ministry of Transport, Works and Communication and the Dar es Salaam Regional Administrations as well as the five Municipal Councils. Some of the policies, laws and administrative regimes that are relevant to this master plan are discussed below:

- **The National Environmental Policy, 1997**

The National Environmental Policy of 1997 outlines six major environmental problems that include (a) land degradation (b) lack of clean and safe water in urban and rural areas (c) environmental pollution, (d) loss of wildlife habitats and biodiversity, (e) destruction of marine resources and (f) (deforestation) (URT, 1997). The Policy stipulates that an EIA shall be mandatory for all major projects to ensure that environmental concerns receive due and balanced consideration in reconciling urgent development needs with long-term environmental sustainability goals. The proposed DARTMP will result in land clearance and possibly trigger other environmental problems as outlined in the policy. This SEA responds to the National Environmental Policy and addresses issues that need the attention of the developer and other stakeholders in ensuring environmental concerns are taken on board during the designing, implementation and decommissioning process for the proposed Urban Transport Master Plan in Dar es Salaam

- **The National Land Policy, 1997**

The overall aim of the National Land Policy (URT, 1997) is “to promote and ensure a secure land tenure system; to encourage the optimal use of land resources and; to

facilitate broad-based social and economic development without endangering the ecological balance of the environment” (*ibid*: 5). Several specific objectives are outlined in the Policy; however, the following are directly related to the proposed DARTMP in Dar es Salaam.

- Ensure that existing rights in land especially customary rights of small holders (who are the majority of the population in the country) are recognized, clarified, and secured in law.
- Ensure that land is put to its most productive use to promote rapid social and economic development of the country.
- Protect land resources from degradation for sustainable development.

The proposed development will certainly have implications on land resources and land tenure and may lead to spiraling of land degradation as well as land dispossession for the local land users.

- **The National Health Policy, 2007**

The National Health Policy defines health as a state of wellness physically, mentally, socially and the absence of diseases. Further, it notes “good health contributes to personal development, the development of the family and the country; especially in ensuring improved livelihoods and poverty reduction” (URT, 2007). In view of this, the Policy aims to achieve sustainable welfare for the society.

The main goal of the National Health Policy of 2007 is to provide geographically balanced and in acceptable standards, affordable and sustainable health services in general. The general objective of the 2007 Health Policy is to uplift the health status of the citizens, especially the vulnerable groups by putting in place health infrastructure that meets community expectations and increase life expectancy of Tanzanians. To achieve this general objective and to realize the policy goal, the National Health Policy has identified nine specific objectives including these two that are directly related to the proposed development.

- (a) To reduce the occurrence and spread of diseases and deaths among the citizens so as to raise life expectancy
- (b) To prevent and control infectious and non-infectious diseases especially HIV/AIDS, malaria, tuberculosis, malnutrition and work place diseases.

Also, the Policy is promoting environmental cleanness in residential areas, work places, improved worker's health and safety and promotion of nutritional programmes and to prevent accidents. Further, the Policy is addressing crosscutting issues such as disaster management, HIV/AIDS, gender focus, poverty reduction, human rights and environmental protection. The proposed DARTMP may trigger health challenges including those that this policy is concerned about. The spread of HIV/AIDS in construction camps is a real threat that needs attention. Thus many provisions of this policy are relevant to the DARTMP.

- **The National Transport Policy, 2003**

The Policy aims at enhancing transport safety and environmental protection through taking steps to review and update national legislation in transport operations and safety requirements.

The vision of the Policy is to have efficient and cost-effective domestic and international transport services for all segments of the population and sectors of the national economy with maximum safety and minimum environmental degradation.

The mission of the Policy is to develop safe, reliable, effective, efficient and fully integrated transport infrastructure and operations that will best meet the needs of travel and transport at improving levels of service at lower cost in a manner that supports government strategies for socioeconomic development whilst being economically and environmentally sustainable.

The Policy is relevant to the Dar es Salaam Transport Master Plan because the proposed plan is directly addressed in the Policy. Further, the vision and mission of the Policy call for sufficient emphasis on all aspect of environment protection, and management throughout the development stages of transport infrastructure so as to ensure strategic

environmental sustainability. Therefore, the DARTMP is fulfilling the Policy by carrying out this SEA.

- **The Tanzania Development Vision 2025**

The main development goal for the Tanzania Development Vision 2025 (URT, 2000) is the alleviation of poverty through improved socio-economic opportunities, good governance, transparency and improved public sector performance. These objectives, not only deal with economic issues, but also include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development.

Vision 2025 seeks to mobilize the people; the private sector and public resources towards achieving shared goals and achieve sustainable semi-industrialized middle market economy by year 2025. The proposed DARTMP is aimed at improve transport system that could stimulate and enhance economic growth.

- ***Five Year Development Plan (FYDP II) 2016/2017 – 2020/2021***

The Second Five Year Development Plan (FYDP II), 2016/17 – 2020/21, integrated frameworks of the first Five Year Development Plan (FYDP I, 2011/2012-2015/2016) and the National Strategy for Growth and Reduction of Poverty (NSGRP/MKUKUTA II, 2010/2011-2014/2015) further extended to 2015/2016).

The FYDP I aimed to unleash the country's resource potentials in order to fast-track the provision of the basic conditions for broad-based and pro-poor growth while the main objective of the NSGRP was to stimulate economic growth and promote the reduction of poverty, improve quality of life and social well-being and improve good governance and accountability.

The objectives of integrating the two frameworks were to improve efficiency and effectiveness in implementation through organizing and rationalizing national resources under one framework, by addressing critical challenges, which beset implementation of the parallel frameworks.

FYDP II is built on three pillars of transformation, namely industrialization, human development, and implementation effectiveness. The objectives of the FYDP II include:

- Build a base for transforming Tanzania into a semi-industrialized nation by 2025;
- Foster development of sustainable productive and export capacities;
- Consolidate Tanzania’s strategic geographical location through improving the environment for doing business and positioning the country as a regional production, trade and logistic hub;
- Promote availability of requisite industrial skills (production and trade management, operations, quality assurance, etc.) and skills for other production and services delivery;
- Accelerate broad-based and inclusive economic growth that reduces poverty substantially and allows shared benefits among the majority of the people through increased productive capacities and job creation especially for the youth and disadvantaged groups;
- Improve quality of life and human wellbeing;
- Foster and strengthen implementation effectiveness, including prioritization, sequencing, integration and alignment of interventions;
- Intensify and strengthen the role of local actors in planning and implementation, and
- Ensure global and regional agreements (e.g. Africa Agenda 2063 and SDGs) are adequately mainstreamed into national development planning and implementation frameworks for the benefit of the country.

This proposed DARTMP is addressing these objectives.

- **The National Policy on HIV/AIDS, 2001**

The Policy identifies HIV/AIDS as a global disaster, hence requiring concerted and unprecedented initiative at local, national and global levels. It recognizes HIV/AIDS as an impediment to development in all sectors, in terms of social and economic development with serious and direct implication on social services and welfare. The Policy provides the general framework for individual and collective response to the HIV/AIDS pandemic. It clearly outlines the pertinent issues associated with the struggle,

including among others the roles of various sectors, the roles in the prevention efforts and the care and support in HIV/AIDS.

One of the Government strategic initiatives outlined in the Policy is the establishment of the Tanzania Commission for AIDS (TACAIDS) with its management functions, institutional and organizational arrangement. TACAIDS provides leadership and coordination of the national multi-sectoral response to the HIV/AIDS epidemic.

The Policy further recognizes the connection between poverty and HIV/AIDS, as most of poor communities in society are very vulnerable to this epidemic.

The Policy is relevant to this DARTMP as it will seek to:

- Prevent of transmission of HIV/AIDS;
- Enhance sectoral roles through participation and financial support; and
- Promote and participate in research on HIV/AIDS, including dissemination of scientific information and development of HIV vaccine.

The DARTMP aims at Enhancement of transport in Dar es Salaam and expect to involve improvement of several transport system including Railway lines, road networks as well as satellite cities, thus involving interaction of the workers and local community members. This poses risks, which may lead to increased transmission of HIV/AIDS to both the workforce and local communities. The Policy directives on the prevention of transmission of HIV/AIDS must be complied with during the implementation of the proposed master plan in order to minimize the problem.

### **National Employment Policy 2008**

The National Employment Policy of 2008 aims to identify potential areas for employment and to lay down strategies of how to utilize such opportunities in promoting employment in the country. DARTMP is expected to provide avenues for employment opportunity and thus supports the national employment policy. Employment opportunities arising from implementation of DARTMP will be examined in terms of skills, numbers and groups (youths, women and others as per the Policy).

### **Sustainable Industrial Development Policy 1996**

Sustainable Industrial Development Policy-SIDP (1996- 2020) (URT, 1996a) is a framework for Tanzania’s industrialization process within the short, medium and long terms perspectives. The main objectives of the SIDP include human development and creation of employment opportunities; economic transformation for achieving sustainable economic growth; external balance of payments; environmental sustainability and equitable development (URT, 1996a: 3).

The Policy outlines several strategies for achieving the mission and objectives and a range of activities that are to be implemented within short, medium term and long-term priority activities. Within the short-term period (1996-2000), the Policy promoted rehabilitation and consolidation of existing industrial capacities through a series of restructuring. The focus was privatization of the public industries to make them produce while reducing the government financing for operation of the industries. During the medium term period (2000-2010), the Policy promoted creation of new “capacities in areas with potential for gaining competitive advantage ....taking into account merging technological innovations” (URT, 1996a: 10). The long-term phase (2010-2022) focussing on basic goods industries. The Dar es Salaam Transport master Plan is in line with Sustainable Industrial Development Policy because improved transport system would enhance transportation of goods and services thus increase industrial development and productivity in Dares Salaam.

### **National Climate Change Strategy 2012**

Tanzania is vulnerable to the increased climate variability and climate change. The development of an effective strategic and institutional framework is crucial to enhance the country’s expertise, governance, technological and infrastructural capacities. The 2012 National Climate Change Strategy has been developed in response to the growing concern of the negative impacts of climate change and climate variability on the country’s social, economic and physical environment.

The NCCS aim to enable Tanzania to effectively adapt to climate change and participate in global efforts to mitigate climate change, whilst also achieving sustainable development.

Adaptation strategies are outlined for water resources, coastal and marine environment, forestry, wildlife, agriculture and food security, human health, tourism, energy (hydropower dams), industry, livestock, and fisheries, *infrastructure, human settlements and land use*. Mitigation is addressed through low-emission energy technologies, policies to conserve energy usage by industries, improved livestock management and food stuffs, *greater efficiency in the transportation*, mining, agriculture and waste management industries, and afforestation and reforestation policies (including REDD+). Additionally, cross-cutting programmes seek to implement public awareness programmes, establish research capacity and training institutions for climate change. The Strategy's estimated financial requirements are USD750m per year through to 2030, with the funding to come from international and some domestic support. The objective of Dar es Salaam Transport Master Plan is in line with the 2012 National Climate Change Strategy.

#### **National Environmental Action Plan (NEAP) (2013 – 2018)**

Mainstreaming environmental concerns into development policies, plans and strategies is one of the priorities in Tanzania's Sustainable Development Agenda. One of the initial mainstreaming efforts has been the preparation of National Environmental Action Plan (NEAP) in 1994. This was a response to the recommendations by the Earth Summit in 1992 held in Rio de Janeiro, Brazil. At this Summit, countries were required to prepare and implement National Environmental Action Plans. The Environmental Management Act No. 20 of 2004 (EMA) also provides for preparation of NEAP in the interval of five years. According to the Act, NEAP is the basis for integrating environmental concerns in formulation and implementation of development plans and programmes.

The revised NEAP highlights the state of the environment identifying key environmental issues. These include Land degradation; Water resources degradation and pollution; Aquatic resources degradation; Loss of wildlife habitats and biodiversity; Deforestation; Urban pollution; Climate change; Modern biotechnology; E-Waste; Invasive alien species; and Biofuels. Furthermore, the NEAP sets targets and indicators for tracking implementation progress. Environmental concerns are cross cutting in nature and their impacts are obviously felt at various levels. Integration of environmental plans in



development process at all levels is an important tool in ensuring Sustainable Development. The DARTMP need to abide to the revised NEAP

### **3.2 Legal Framework**

The proposed master plan will have implications on a variety of laws and regulations that would require taking them into account during planning and implementation of the plan. These laws and regulations include the following:

- **The Environmental Management Act, 2004**

The Environmental Management Act (EMA) Cap. 191 (URT, 2004a) sets out a range of measures for sustainable management of the environment, prevention and control of pollution, waste management, and direct mechanisms for compliance.

Section 7 (2) states that “ *the Act provides a legal framework necessary for coordinating harmonious and conflicting activities with a view to integrating such activities into an overall sustainable environmental management system by providing key technical support to sector Ministries*”

The act is therefore a cross-sectoral piece of legislation and supersedes other written laws with respect to environmental management. Specifically, Section 232 stipulates:

*“Where the provision of this Act is in conflict or is otherwise inconsistent with a provision of any other written law relating to environmental management the provision of this Act shall prevail to the extent of such inconsistency”*

All matters pertaining to environment management may be governed by sectoral legislations, as long as they do not conflict with the EMA (2004).

Part VII of the Act is devoted to Strategic Environmental Assessment and provides directives on how and who should be responsible for undertaking an SEA. Section 104 (2) states that “ *...when promulgating regulations, public policies, programmes and development plans shall include a Strategic Environmental Assessment Statement on the*

*likely effects of such regulations, public policies, programmes or development plans may have on the environment” (URT, 2004).*

Section 104 (3) (a-e) outlines conditions for the preparation of SEA reports. The proposed master plan may increase energy generation and stimulate economic development in the country however, this Act gives provisions on the protection of the environment against various activities that may have implications and arising from the proposed Dar es Salaam Transport Master Plan.

This Act requires responsible sectors to notify the Division of Environment when they are undertaking activities that call for an SEA or as they undertake an SEA. In this SEA for the DARTMP under Dar es Salaam City Council, the PORALG has notified VPO and commissioned this study.

- **The Strategic Environmental Assessment Regulations, 2008**

These SEA Regulations are made under Section 230 (2) (r) of the Environmental Management Act, 2004 to provide for general guidance on how to conduct SEAs in Tanzania. The regulations state the objective of SEA to include several issues relate to policies, bills, regulations, acts, etc but specifically for this geothermal, these would include the following:

- a) Ensure that environmental concerns are thoroughly taken in the proposed Urban Transport Master Plan
- b) Enable the public contributes to the consideration of environmental concerns during the preparation of the Urban Transport Master Plan;
- c) Establish clear, transparent and effective procedures for the formulation of Urban Transport Master Plan; and
- d) Integrate environmental concerns into measures and instruments designed to further sustainable development for the Urban Transport Master Plan.

The Regulations have guided the preparation of this SEA with support of the national SEA Guidelines.

- **The Land Act, 1999**

The Land Act 1999 (Act No 4 of 1999) (URT, 1999) provides the legal framework for the implementation of the Land Policy. This Act address various issues including defining the legal framework for land tenure system, and how land could be used for social and economic development. The Act also defines issues of land acquisition and compensation to affected people. It further provides guidance to land ownership in Tanzania. The provisions of this Act in relation to land use planning and loss of land to local people are addressed in this SEA report, especially by taking note of the fact that land acquisition for this DARTMP may result in loss of land and that affected person must be fully, adequately and timely compensated for nay loss they may incur.

- **The Land Regulations, 2001**

The Land Regulations (URT, 2001) provides various guidance in terms of: (a) Management and Administration; (b) Granted right of occupation; (c) Mortgage; (d) Leases; (e) Easements; (f) Co-occupancy; and (g) Miscellaneous. Others are on contracts occupancy of mortgage, lease) and derivative right granted by the Tanzania Investment Centre. These Regulations will be relevant to the DARTMP in as far as matter of land tenure and land rights are concerned.

The proposed master plan will take place in Dar es Salaam region and may touch all five municipals and several wards. It is important to link these regulations and the Land Act with the proposed development to explore the extent the proposed development will impact on land resources.

**Urban Planning Act, 2007**

The Urban Planning Act No. 8 Of 2007 make provision for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters.

The Act establishes planning scheme which the main objective is to coordinate all development activities and control the use and development of land including intensive use of urban land and, in particular, vertical and compact urban development as per section 16 (1). Section 29 (1) prohibit any person to develop any land within a planning area without planning consent granted by the planning authority or otherwise than in accordance with planning consent and any conditions specified therein. Additionally section 30 (1) of this Act, direct any person being a holder of a granted right of occupancy who intends to change or vary the use of any land to apply for varying the use of any land. The proposed DARTMP is expected to be developed in different areas within the city with different land use, thus the need to consider Urban Planning Act is of paramount.

- **The Railways Act, 2002**

The Railways Act provides for development and promotion of rail transport service, to establish Rail Assets Holding Company Limited (RAHCO), to provide for a regulatory framework of railway transport by the Surface and Marine Transport Regulatory Authority (SUMATRA) and to provide for related matters. The act gave regulator power to SUMMATRA in respect of railway transport (a) to issue licenses to railway operators; ... (b) to regulate tariffs. (c) to monitor rail transport service standards and standards of performance; (d) to initiate and conduct investigations in relation to the quality of service provided by rail transport operators;

Environmental health and safety issues covered in the Railways Act include:

- Endangering safety;
- Drunkenness while on locomotive;
- Trespass-related offences;
- Failure to obey lawful instructions, obstructing;
- Powers of entry by railway operators to prevent accidents;
- Entry on land to alter position of pipes;
- Power to take water from natural sources; and
- Accommodation works – crossings, bridges, culverts and drains.

Part IV of the Act highlight on railway safety. It vests the power for safety regulation to SUMATRA and emphasizes the need inspection to make sure that the railways are safer.

This Act is considered as the DARTMP consider railway lines as major means of transport in Dar es Salaam. Thus this SEA calls for insuring that environmental issues are considered.

- **Occupation Health and Safety Act (OSHA Act)**

The Occupation Health and Safety Act, (No. 5) (2003) deals with issues related to health and safety of workers in industrial areas. Specific provisions of the OSHA – namely Section 21, 60, 61, 73-75 and 96 must be fully addressed in order to comply with this legal requirement.

The Act addresses issues of safe equipment, provision of personal protective equipment and a clean and safe work environment (e.g. provision of regular medical examination, air, drinking water, sanitary convenience, washing facilities, accommodation for clothing, first aid facilities: including safety training, etc.). The proposed Dar es Salaam Transport Master Plan should operate within the requirements of this Act.

Other regulatory frameworks that are relevant to the proposed development include the Surface and Marine Transport Regulation Authority (SUMATRA Act of 2001; the Town and Country Planning Ordinance (Cap 378 of 1958) and Amendment of 1961, for planning purposes; the Local Government Act (District & Urban Authorities (revised in 1997) and the Antiquities Act 1974.

**National Construction Council Act, 1979**

This is an Act to establish the National Construction Council and to provide for matters connected with and incidental to the establishment of that Council. The main functions of the council includes: -

- a) to promote the development of the construction industry in Tanzania;
- b) to plan and co-ordinate the activities of persons engaged in the construction industry in Tanzania ;

- c) to provide advisory services and technical assistance necessary for, or incidental to the proper development of the construction industry, to institutions and other persons engaged in the construction industry;
- d) to advise the government on all matters relating to the development of the construction industry and to formulate proposal and recommendations for their implementation;
- e) to promote the documentation and dissemination of information on any aspect of research into any activity connected with the construction industry, carried out by the Council or any person or institution, and may for that purpose publish any newspaper, journal or periodical or do any other thing designed to promote research in any matter which is necessary or desirable for the efficient development of the national construction policy;
- f) to monitor the implementation of standards and regulations relating to the construction industry;
- g) to monitor construction costs and make suggestion for their control;
- h) to give advice on, the economical use of materials for construction and to encourage the maximum use of local materials;
- i) to carry out and promote the carrying out of research in various aspects of the construction industry and to co-ordinate that research;
- j) to advise the Government, or institutions engaged in the construction industry, on the adaptation of technology in the construction industry:

Part 11 section (1) of the Act require every person engaged, or intending to engage, in the field of construction industry research within the United Republic shall, at his own expense, furnish to the Council information relating to that research and shall make available to the Council copies of any relevant records or findings in such form and within such periods as may be prescribed, and that everybody that may contravene or fail to comply with Part 11 section (1) shall be guilty of an offence and shall be liable on conviction to a fine not exceeding ten thousand shillings, but no person shall be prosecuted for any offence under this section within six months after the commencement of this Act. Therefore DARTMP would require co comply to this Act.

### **The Tanzania Investment Act, 2002**

The Tanzania Investment Act Cap 38 R: E 2002, provides sections that define conditions for investing in Tanzania. The incentives provided in the Act applies to business enterprises that are either wholly owned by a foreign investor or in a joint venture with a minimum investment capital of not less than US\$300.000. Similarly, investments by nationals with capital of not less than US\$ 100,000 qualify for such incentives.

Alongside stating incentives for investors, the Act also sets out immigration quotas for foreign workers, conditions for obtaining credit from domestic sources by foreign investors and procedures for technology transfer. Although investors are required to submit environmental status report as part of the bid document to the TIC, the Act itself does not contain any provisions for ensuring that investment activities are undertaken in an environmentally acceptable manner.

### **Employment and Labour Relations Act, 2004**

This Act makes provisions for core labour rights, to establish basic employment standards, to provide a framework for collective bargaining, to provide for the prevention and settlement of disputes and to provide for related matters. Part II of the Act describes fundamental rights and protections for child labor, forced labor, discriminations and freedom of associations. Part III provides for employment standards, which include issues like Hours of Work, Remuneration, Leave, Unfair Termination of Employment and Other Incidents of termination. The implementation of DARTMP shall ensure that the employment standards as provided for by the Act are adhered to.

### **Environmental Management (Standards for the Control of Noise and Vibration Pollution) Regulations, 2015 – G.N. # 32 of 30/1/2015**

The main objective of these regulations includes:

- (a) To ensure the maintenance of a healthy environment for all people in mainland Tanzania; the tranquility of their surrounding and their psychological well being by regulating noise and vibration levels;

- (b) Prescribe the maximum permissible noise and vibration levels from a facility or activity;
- (c) Provide for the control of noise and vibration and mitigating measures for the reduction of noise and vibration;
- (d) Set baseline parameters on noise and vibration permissible levels based on a number of practical considerations and acceptable limits;
- (e) Enforce minimum noise and vibration limits prescribed by the National Environmental Standards Committee;
- (f) Help developers such as industrialist to keep abreast with environmentally friendly technologies;
- (g) Ensure protection of human health and the environment from various sources of noise and vibration pollution.

Regulation 7 (1-2) of these regulations prescribes general prohibitions on noise and state “no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose health or safety of others and that of the environment” Several factors are considered before noise is considered beyond acceptable levels. These include (a) time of the day (b) proximity to residential area (c) proximity of noise control zones, including hospital and schools (d) whether the noise is recurrent, intermittent or constant (e) the level and intensity of the noise (f) whether the noise has been enhanced in levels or range by any type of electronic or mechanical means (g) whether the noise can be controlled without much effort or expense to the person making noise.

Regulation 8 refers to prohibition on excessive vibration and states that “no person shall (a) Make or cause to be made excessive vibration which annoys, disturbs, injure or endanger the comfort, repose health or safety of others and the environment (b) Cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source, property boundary or 30 meters from any moving source.

Regulation 9 refers to the permissible noise levels and tolerance limits for environment vibrations. These are noise levels measured during the day (06:00am to 10:00pm) and the night (10:00pm to 06:00am). Part IV of the First Schedule provides allowable noise



levels from construction sites to buildings other than homes, institutions of higher learning, homes for disabled persons is 75 dBA during the day and 65 dBA during the night. Part I of the First Schedule provides the permissible noise levels for general environment; in industrial area is 70 dBA during the day and 60 dBA during the night. Part VI of the First Schedule provides the maximum noise level from a place of entertainment or establishment in the Noise Control Zone.

According to these regulations, excessive vibration will not be permissible anywhere within 10 meters of residence, hospital, schools, or other premises in which people could reasonably expect to be free from undue annoyance and nuisance caused by vibration.

The Second Schedule of these regulations provides details regarding tolerance limits for environmental aspects. For example, tolerance limits for whole body vibration (measured at an exposure of 8 hours is  $1.15 \text{ m/s}^2$  while the exposure action value is  $0.5 \text{ m/s}^2$ . Limits for hand arm vibration also measured at 8 hours exposure is  $5 \text{ m/s}^2$  with an exposure action value of  $2.5 \text{ m/s}^2$ . These limits are for individuals operating machines that emit vibrations. Tolerance limits for receptors – e.g. through ground vibration at sensitive sites) is 5 mm/s PPU at all times and for subsonic vibration (air over), it is 120dB<sub>L</sub> at all times.

These regulations also provide directives on how to carry out monitoring of the impact of noise and vibration. The implementation of DARTMP must adhere to the provisions of these regulations.

### **Environment Management (Control of Ozone depleting Substances) Regulations, 2007**

The object for these Regulations includes

- (a) To eliminate the production and consumption of ozone depleting substances in accordance with the phase out schedule of the Montreal Protocol;
- (b) To regulate the production, import, export, trade, disposal and use of ozone depleting substances and its products;

- (c) To control and monitor the amount of ozone depleting substances entering or leaving the United Republic of Tanzania and provide a system of data collection that will facilitate compliance with relevant reporting requirements under the Protocol;
- (d) To promote measures, strategies, programmes, incentives, equipment and technologies in favour of the use of ozone friendly substances, products and equipment in line with national obligation specified by the Montreal Protocol; and
- (e) To facilitate the link between National Ozone Unit and the Ozone Secretariat of the Protocol.

With regard to prohibitions on Ozone Depleting Substances; Section 5 subsection 1 prohibit any person who manufactures, or imports or exports, sells, offers for sale or installs a controlled substance or product listed in the First and Second Schedules to these Regulations without a licence issued by the Director of Environment. Subsection 3 prohibits any person to import or export a controlled substance or product from or to a country that is not a party to the Protocol.

The regulations under section 8 subsection 1; Prohibit any person to import (a) second-hand refrigerators and air conditioners which are designated to use CFC-12 (R-12) or CFC-11 (R-11) as coolant;(b) brand new CFC refrigerators and air conditioners;(c) vehicles fitted with an air conditioner or refrigeration units with CFC coolants;(d) aerosol product which uses CFCs as carrier gases or propellants. The implementation of DARTMP would need to abide to these regulations.

**Legal Provisions on Waste Management Issues;**

Part IX of the Environmental Management Act Cap. 191 directs on the management of solid waste. Section 114 provides duties of the local government authorities to manage and minimize solid waste and Sections 133- 139 refers to management of hazardous waste. Environment management (Hazardous Waste Management) Regulations, 2009 and Environment Management (Solid Waste Management) Regulations 2009 compel all developers to ensure they deposit waste appropriately.

### **3.3 Institutional and Administrative Framework**

The Dar es Salaam Transport Master Plan is expecting to touch the interest of President Office Regional Administration and Local Government and Dar es Salaam City Council therefore; it falls under the jurisdictions of *The Local Government Authorities* for administrative purposes. The Local Government Authorities include the City Council, Municipal Councils, Ward and 'Mtaa' which will be responsible for making that the interest of local communities are considered; these include employment opportunities associated with implementation of DARTMP, compensation for affected people, protection from environment pollution as well as resolving conflict relating to the implementation of the proposed master plan.

Lawfully, The Division of Environment (DoE) within the Vice President's Office (VPO) is responsible for SEA, as per the Environmental Management Act Cap 191 and as also highlighted in the Strategic Environmental Assessment Regulation of 2008. The DoE issue permits to Ministries to carry out SEA, conducts field verification to areas subjected to SEA and carries out public hearing of the SEA reports in order to get comments. Furthermore, the DoE issues approvals for SEAs to be used to inform the making of a policy, plan or program as the case may be.

In addition, the Environmental Act directs sector ministries to initiate and supervise the preparation of the SEA. The implementation of the programs, policy, legislation, or plan for which the SEA is necessary falls under the sectors responsible for those activities. In this case, the President Office Regional Administration and Local Government (PO-RALG) has initiated this SEA for the region under its jurisdiction and will be held accountable for ensuring the mainstreaming of environmental concerns into the regional plan based on the recommendations from the SEA report.

The Environmental Management Act (Cap. 191) directs all sector ministries to establish Sector Environmental Coordination Units responsible for ensuring implementation of environmental law in its sector. The PO-RALG Environmental Unit in Dar es Salaam Region will be responsible for this SEA, in collaboration with the Environmental Office of the Regional Secretariat at the local regional office.

Although, this set up is provided in the law, it is crucial such units at the PO-RALG Office as well as at the regional levels become fully functional. The need to develop their capacity in terms of human resources, finances and equipment so that they can discharge their functions properly is apparent.

### **3.4 International Conventions and Standards**

Tanzania has signed and ratified a number of international conventions and treaties that commit the country to conservation and protection of biological and environmental resources. The DARTMP will need to take into account relevant aspects of those conventions into the specific project designs and management. Some of the conventions that are relevant to the DARTMP include the following:

- **United Nations Framework Convention on Climate Change – UNFCCC, 1992** is an international environmental treaty adopted at the Earth Summit in Rio de Janeiro in 1992, entered into force on 21 March 1994. So far it has ratified by 196 states. The primary purpose of the convention is to establish methods to minimize global warming and in particular the emission of greenhouses gases. Therefore the UNFCC is regarded as the first step to a safer future because its ultimate objective is “stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference within the climate systems” The Convention states that such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that the food production is not threatened, and to enable economic development to proceed in a sustainable manner ([www.unfccc.int/essential\\_background/convention/items/6036.php](http://www.unfccc.int/essential_background/convention/items/6036.php)). Although UNFCC puts the onus on developing countries to lead on the way of cutting down in GHG emissions it also directs new funding to climate change activities in developing countries especially in adaptation measures. UNFCC recognizes that economic development is vital to the world’s less developed countries and notes that as these countries struggle to develop, their share of GHG emission will grow. UNFCC thus works with these countries through a variety of arrangements to put in place policies and programmes that

will limit emissions in ways that will not hinder their economic progress including adoption of Clean Development Mechanisms as part of the Kyoto Protocol (UNO, 1992).

Tanzania is a signatory to the Kyoto Protocol. Tanzania has signed up to many of the UNFCCC directives and is implementing a National Climate Change Strategy. In view of this as well as the Paris Agreements that Tanzania has ratified, the proposed DARTMP development will have to take into account those commitments and address GHG emission.

- The ***UNESCO Convention for the Protection of the World Cultural and Natural Heritage, (World Heritage Convention) 1972*** aims at encouraging the identification, protection, and preservation of earth's cultural and natural heritage. It recognizes that the nature and culture are complementary and that cultural identity is strongly related to the natural environment in which it develops.

The Convention provides for the protection of those cultural and natural 'properties' deemed to be of the greatest value to humanity. In the course of implementing this Project, cultural and heritage objects may be discovered. Recommendations will be made according to the Tanzanian legislation and policies and international best practices on how to handle these objects at the project level.

- ***International Convention on Biological Diversity 1992***. Tanzania is signatory to the Convention on Biological Diversity (CBD) since June 1992 and has taken steps to ensure conservation and use of these resources in judicious ways. Biological resources in Tanzania are facing a significant threat from unsustainable utilization, including increased poaching of wildlife. While Dar es Salaam may not be very rich in terms of biodiversity of large mammals and plants, it is nonetheless equally important to ensure the basic tenets of this Convention are adhered to in the DARTMP

- **Japan International Cooperation Agency (JICA) Guidelines for Environmental and Social Considerations 2010**. The objectives of the guidelines are to encourage developer and other interested part; to have appropriate consideration for

environmental and social impacts, as well as to ensure that JICA's support for and examination of environmental and social considerations are conducted accordingly. The guidelines outline JICA's responsibilities and procedures, along with its requirements for proponents etc., in order to facilitate the achievement of these objectives. In doing so, JICA endeavors to ensure transparency, predictability, and accountability in its support for and examination of environmental and social considerations.

JICA encourages host country governments, including local governments, borrowers, and project/plan proponents, to implement the appropriate measures for environmental and social considerations when engaging in cooperation activities. At the same time, JICA provides support for and examinations of environmental and social considerations in accordance with the guidelines.

The impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accidents, water usage, climate change, ecosystems, fauna and flora, including trans-boundary or global scale impacts. These also include social impacts, including migration of population and involuntary resettlement, local economy such as employment and livelihood, utilization of land and local resources, social institutions such as social capital and local decision-making institutions, existing social infrastructures and services, vulnerable social groups such as poor and indigenous peoples, equality of benefits and losses and equality in the development process, gender, children's rights, cultural heritage, local conflicts of interest, infectious diseases such as HIV/AIDS, and working conditions including occupational safety. Items to be addressed in the specific project are narrowed down to the needed ones through the scoping process. With regards to consultation with stakeholders; the guideline hearten consult with local stakeholders through means that induce broad public participation to a reasonable extent, in order to take into consideration the environmental and social factors in a way that is most suitable to local situations, and in order to reach an appropriate consensus.

- **IFCs Policy on Environmental and Social Sustainability (2012).** The International Finance Corporation (IFC) 2012, strives for positive development outcomes in the activities it supports in developing countries. IFC believes that an important component of achieving positive development outcomes is the environmental and social sustainability of these activities, which IFC pursues and expects to achieve through the application of this Policy on Environmental and Social Sustainability (the Sustainability Policy or the Policy), and a comprehensive set of environmental and social Performance Standards. The SEA also is complying with the IFC applicable requirements of the Performance Standards and mitigation measures are included based on the premise that decision-makers must be aware of risks and trade-offs to the extent possible as a basis of informed decision-making. Careful monitoring of social and environmental parameters and indicators available will be necessary while considering precautionary approach in decision making about the implementation of the plan.

With regard to stakeholder consultation; the IFC require clients to engage in a process of Informed Consultation and Participation (ICP) in cases where the development activities to be financed is likely to generate potential significant adverse impacts on communities (i.e., Affected Communities) or is likely to generate potential adverse impacts on local Peoples. This SEA involved stakeholders at all stages.

IFC policy on environmental and social sustainability believes that women have a crucial role in achieving sound economic growth and poverty reduction. They are an essential part of private sector development. Thus activities related to the proposed DARTMP should consider minimizing gender-related risks and unintended gender differentiated impacts.

#### **World Bank Safeguard Policies,**

This SEA has also been prepared to fully comply with the World Bank Safeguard Policies and procedures, which have to be taken into account along with the Tanzanian legislations and policies during the implementation of the Dar es Salaam Transport Master Plan. The World Bank Safeguard Policies include the Environmental Assessment: OP/BP 4.01, the Natural Habitats: OP/BP 4.04, the Forests: OP/BP 4.36, the Physical

Cultural Resources: OP/BP 4.11, the Involuntary Resettlement: OP/BP 4.12, the Projects in International Waters: OP 7.50 and the Projects in Disputed Areas: OP 7.60.

- ***Environmental Assessment: OP/BP 4.01***

The objective of this Operational Policy (OP) is to ensure that environmental assessments is undertaken in those categories of projects that have or are likely to have potentially significant impacts on the environment.

Under this OP, projects are categorized as A, B, C and D according to their type, scale, location and anticipated significance of potential environmental impacts. The category indicates the scope and detail required for EIA. According to this OP, the DARTMP necessitate implementation of projects including upgrading of road to bitumen standard and railway lines within which may have significant adverse environmental and social impacts that may be irreversible and diverse, therefore requiring full and comprehensive EIA.

- ***Natural Habitats: OP/BP 4.04***

This Operational Policy recognizes that conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. During project financing, the World Bank considers if that project supports the protection, management and restoration of natural habitats, as well as policy dialogue and economic and sector work. The World Bank supports and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native

***Forests: OP/BP 4.36***

The objective of this OP is to ensure forest resources are taken into account in any project design and implementation so as to ensure they are not affected. This OP is relevant whenever any World Bank financed investment project has potential to cause impacts on



the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests or aims to bring about changes in the management, protection or utilization of natural forests or plantations.

The existing land use in the project area include built-up areas, cultivation in suburb areas and some riverine vegetation (comprising of coastal shrubs, while along the beach areas coastal swamps and mangrove trees). The natural forest exist in few localized areas on the outskirts of the city especially in protected areas (e.g. Pande game reserve), and unprotected area like University of Dar es Salaam Campus, Mabwepande, Changanyikeni and Makongo and other Military owned areas. The proposed project may have impacts on the health and the quality of these remaining forests and therefore, will have to abide by the provisions of this OP in order to safeguard these patched forest resources.

- ***Physical Cultural Resources: OP/BP 4.11***

OP 4.11 aims to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For the purposes of this OP, ‘physical cultural resources’ are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community. This OP is relevant to the DARTMP and therefore need to be adhered to.

- ***Involuntary Resettlement: OP. 4.12***

This OP acknowledges that development projects that displace people generally give rise to economic, social and environmental problems. Thus, the World Bank guidelines prescribe measures to minimize the negative impacts and ensure that the displaced community benefits from the project.

The objective of this OP is to:-

- (a) Avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs;

- (b) Assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them;
- (c) Encourage community participation in planning and implementing resettlement; and
- (d) Provide assistance to affected people regardless of the legality of land tenure.

This OP does not only cover physical relocation, but any loss of land or other assets resulting in:-

- (a) Relocation or loss of shelter;
- (b) Loss of assets or access to assets; and
- (c) Loss of income sources or means of livelihood, whether or not the affected people must move to another location.

The Dar es Salaam Urban Transport Master Plan is aiming at harmonizing transport system and urban structures. Harmonization will involve acquisition of land and therefore some people will be displaced. Thus the provisions of this OP must be followed when dealing with affected persons.

### **African Development Bank Group's Integrated Safeguards System, 2013**

The Integrated Safeguards System (ISS) consists of an Integrated Safeguards Policy Statement, Operational Safeguards (OSs), a revised set of Environmental and Social Assessment Procedures (ESAPs) and) Integrated Environmental and Social Impacts Assessment (IESIA) Guidance

The Bank's Integrated Safeguards Policy Statement sets out the Bank's own commitments to and responsibilities for delivering the ISS: to (i) ensure the systematic assessment of environmental and social impacts and risks; (ii) apply the OSs to the entire portfolio of Bank operations; (iii) support clients and countries with technical guidance and practical support in meeting the requirements; (iv) implement an adaptive and proportionate approach to environmental and social management measures to be agreed with clients as a condition of project financing; (v) ensure that clients engage in meaningful consultations with affected groups; and (vi) respect and promote the protection of vulnerable groups, in a manner appropriate to the African context.

The Policy Statement also highlights the importance of compliance monitoring and supervision to ensure that the safeguards are implemented. Moreover it includes a list of goods harmful to the environment for which Bank-provided funds may not be used in either public or private investments.

The ISS recognizes the challenge to development efforts brought about by climate variability and change, as development interventions interact with the physical and ecological environment. The ISS requires that Bank-sponsored projects be screened and categorized according to their vulnerability to the risks of climate change. The Bank's new screening tool for climate change risk will support the ISS in addressing vulnerability to climate change and building adaptation measures into Bank operations.

With regard to Involuntary Resettlement (Land Acquisition, Population Displacement and Compensation); this safeguard consolidates the policy commitments and requirements set out in the Bank's policy on involuntary resettlement, and it incorporates refinements designed to improve the operational effectiveness of those requirements. In particular, it embraces comprehensive and forward-looking notions of livelihood and assets, accounting for their social, cultural, and economic dimensions. It also adopts a definition of community and common property that emphasizes the need to maintain social cohesion, community structures, and the social inter-linkages that common property provides. The safeguard retains the requirement to provide compensation at full replacement cost; reiterates the importance of a resettlement that improves standards of living, income earning capacity, and overall means of livelihood; and emphasizes the need to ensure that social considerations, such as gender, age, and stakes in the project outcome, do not disenfranchise particular project-affected people.

On Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource Efficiency – This safeguard covers the range of impacts of pollution, waste, and hazardous materials for which there are agreed international conventions and comprehensive industry-specific standards that other multilateral development banks follow. It also introduces vulnerability analysis and monitoring of greenhouse gas emissions levels and provides a detailed analysis of the possible reduction or

compensatory measures framework. The Integrated Safeguards System must be followed during implementation of the Dar es Salaam Urban Transport Master Plan.

### **Sustainable Development Goals 2015-2030**

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity (<http://www.tz.undp.org/content/tanzania/en/home/sustainable-development-goals.html>).

The SDGs work in the spirit of partnership and pragmatism to make the right choices now to improve life, in a sustainable way, for future generations. They provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large. The SDGs are an inclusive agenda. They tackle the root causes of poverty and unite us together to make a positive change for both people and planet.

There are 17 sustainable development goals. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.

The 17 Sustainable Development Goals for the period 2015-2030 are:

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all

7. Ensure access to affordable, reliable, sustainable, and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts (in line with the United Nations Framework Convention on Climate Change)
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

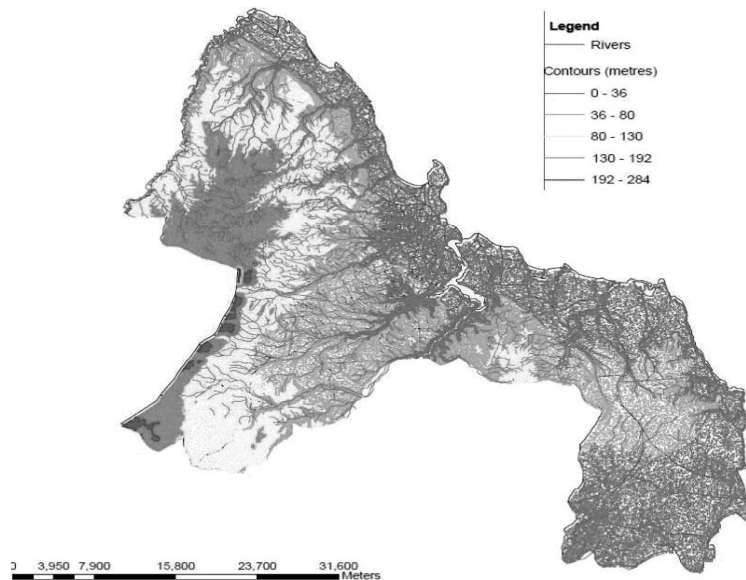
Tanzania has committed to implement these goals and already taking steps to interpret by beginning with integrating the SDGs into the national plans and programmes.

## 4.0 ENVIRONMENTAL BASELINE CONDITIONS

### 4.1 Natural Environment

#### 4.1.1 Location and topography

Dar es Salaam is characterized by flat topography along the coast of the Indian Ocean in the south–east and getting slightly undulating and hilly in the hinterland mainly in the north-west. Dar es Salaam city is divided into three zones, namely the upland zone comprising of hilly areas to the west and north of the city, the middle plateau, and the lowlands, which include Msimbazi Valley, Jangwani, Mtoni, Africana and Ununio areas (Map 2). Topographically the city lies in a flood plain and/or near flood plains and thus flooding is one characteristic of the city, particularly when there are heavy rains. The beach and shoreline comprise sand dunes and tidal swamps. Coastal plains composed of limestone extend 10 km to the west of the city, 2-8 km to the north, and 5-8 km to the south (TSCP, 2014). Inland, alluvial plains comprise a series of steep-sided U-shaped valleys. The upland plateau comprises the dissected Pugu Hills (Dongus, 2000). The local topographical conditions are further summarized in table 1 below



**Map 2: Topographical Condition of Dar es Salaam City**

Source: *TSCP, 2014*

**Table 1: Topographical Condition and Associated Characteristics**

	<b>Level</b>	<b>Condition</b>
Lowland	<5 m	Areas in the bay area, river mouths and hinterland along the coast. Marsh and swampy areas widely spread, soft soil, thick and drains poorly
Plain/Terrace	5 – 20 m	Flat plains/terrace, extend along the coast and are generally a few kilometers wide. Geographically it belongs to the coastal plain
Terrace/Hill	20 – 60 m	This makes up the dominant of the residential terrain of Dar es Salaam, and are gently sloped areas, consisting of residual weathered limestone (murrum-earth material); many of these terraced areas of 500 m to 1000 m are observed around the banks of dare s Salaam City, and have been known to act as flood plains
Hill	60 – 150 m	This zone extend to the Southwest of the study area, the geographical original of which is raised coral reefs, the undulating of which is dependent on the degree of weathering.
Mountain	> 150 m	In the West region of Dar es Salaam, 30 km inland, composed of limestone associated with sandstone of the older geographical area, steep and rigid slopes are formed

Source: TSCP, 2014

#### 4.1.2 Climate

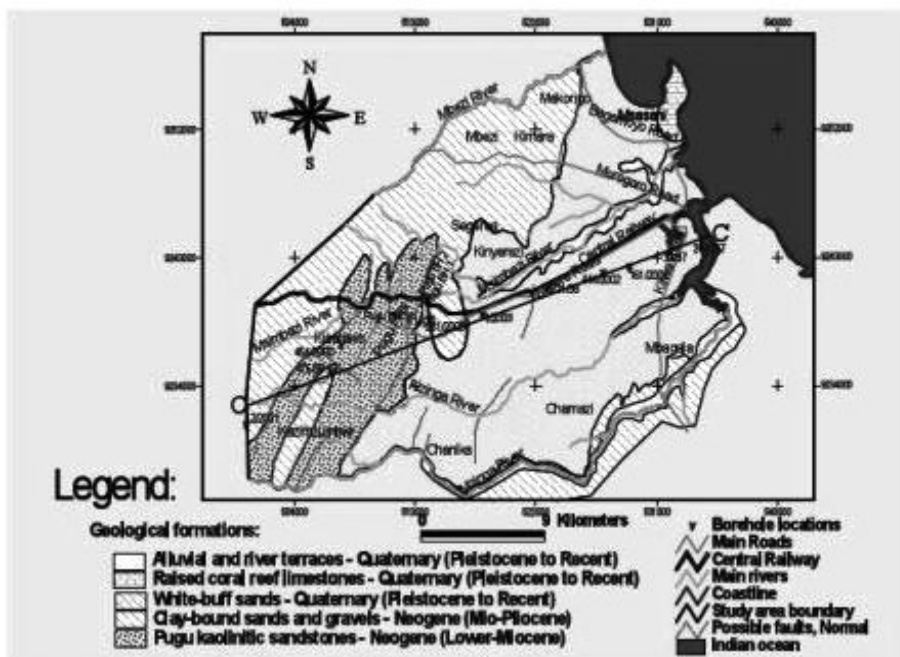
Tanzania generally lies in the tropical savanna belt while Dar es Salaam is located in the wetter and warmer coastal area. The climate is characterized by high temperatures almost throughout the year, ranging from 19<sup>0</sup>C to 33<sup>0</sup>C. The maximum temperature is experienced in October and November. The annual average temperature is 25.4<sup>0</sup>C. Rainfall is bimodal with short rains falling from November to December and the long rains from March to June. Maximum average rainfall ranges between 800 mm to 1200 mm and mostly rains in April.

#### 4.1.3 Geology and soils

According to the Quarter Degree Sheet 186 of the Geological Survey of Tanganyika (1963) Dar es Salaam has two major geological units: (i) the underlying substratum of (semi-) consolidated formations and outcropping rocks that consist of Neogene clay-bound sands to hard sandstone; and (ii) the superficial mainly loose sediments of the

Quaternary System which are more extensive in the central and southern parts of Dar es Salaam region and consist of less consolidated terrace sands and sandstones and recent alluvium (Mtoni et al., 2012). The geological formation of Dar es Salaam is shown in Map 3.

The soil found in Dar es Salaam City is often clayey and partly sandy, and therefore relatively unproductive regarding agricultural use (Dongus, 2001). In the river valleys, which are recent floodplains and subject to flooding, alluvial soils (mainly Eutric Fluvisols and Eutric Gleysols) are dominant (Muster, 1997). Soil erosion in the urban area occurs primarily at the slopes of river valleys, where no vegetation is left to hold the soil in place, and is intensified by human activities such as extraction of construction materials.



**Map 3: Geological Formation of Dar es Salaam**

Source: *Mjemah, 2013.*



#### 4.1.4 Biodiversity, flora and fauna

The project area belongs to the Northern Zanzibar-Inhambane Coastal Forest Mosaic ecoregion that is among the areas with the highest densities of plant species in the world. The Northern Zanzibar-Inhambane Coastal Forest Mosaic ecoregion, along with the Eastern Arc montane forests together, harbour densities of plant species that are among the highest in the world. The region is one of the biodiversity hotspots for conservation (Coastal Forest of Tanzania/Kenya – (Myers *et. al.*, 2000). The existing land use in the project area include cultivation, built-up areas and some riverine vegetation (bush thickets mixed with annual herbs, grasses and some trees, mainly palms). Due to the existing land use, much of the natural vegetation has been converted into artificial vegetation in form of man made gardens, farms and landscaped areas. Tree species found include Neem trees (*Azadirachta indica*) and Ashoka trees (*Polyalthia longifolia*) (which are among the most commonly planted trees in Tanzania) and a few African teaks (*Tectona grandis*). The remaining natural forest exist in few localized areas on the outskirts of the city especially in protected areas (e.g. Pande game reserve), and unprotected areas like University of Dar es Salaam Campus, Mabwepande, Changanyikeni and Makongo and other Military owned areas. The vegetation type in these areas constitutes of various species of disturbed bushland and woodland species (URT, 2014) comprising of coastal shrubs, while along the beach areas coastal swamps and mangrove trees in areas like Mbezi Beach, Kijichi, Kigamboni, Kunduchi, and Mbweni are characteristic. The vegetation of Dar es Salaam is shown in Map 4.

- **Fauna**

There are limited wildlife resources in Dar es Salaam City due to its high demand for land for settlements and industrial development. The population particularly of larger animals has been significantly reduced. The main fauna found in the project area include domestic animals and some wildlife - predominantly generalists tolerant to human presence like rodents i.e. house rat (*Rattus rattus*) and giant cane rat (*Thryonomys sp.*), snakes (*Psammophis spp.*), shink (*Mabuya varia*), bufo (*Amietophrynus gutturalis*), other frogs and terrapins (*Pelusios sp.*). North of the project area, at University of Dares Salaam campus, there are species of carnivores and primates (Senzota, 2012). Among

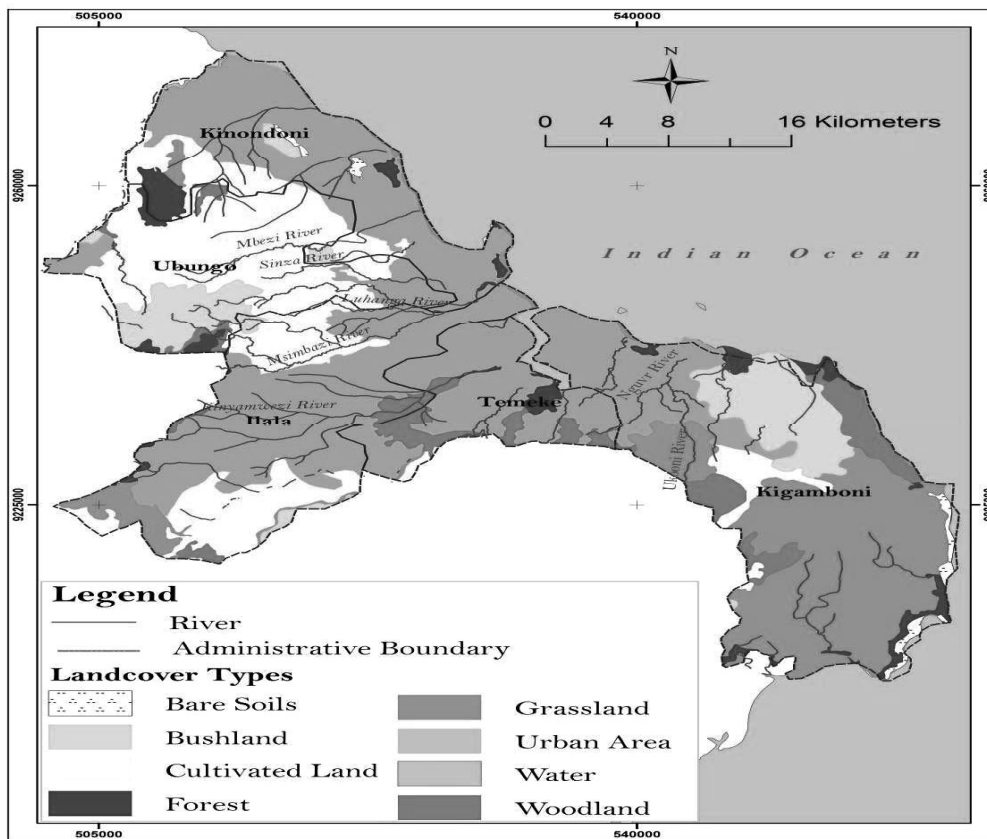
primates, the existing species have least conservation status. The vervet monkey (*Chlorocebus aethiops*) is extremely adaptable specie that can live in both rural and urban environments (Kingdon & Butynski 2008), while the lesser galago (*Galago senegalensis*) is possibly the most widespread galago species (Bearder *et. al.*, 2008). Similarly, carnivores like the banded mongoose (*Mungos mungo*) and genets (*Genetta* sp.) occur in a wide range of habitats (Hoffmann 2008).

The only place where large animals can be found is in the Dar es Salaam Zoo located in Kigamboni, in Temeke municipality. Also a diverse assemblage of seabirds is found in the Dar es Salaam Marine Reserves System (DMRS), including both seasonal migratory and local birds. The common bird species sighted include the White reef heron (*Egretta dimorpha*), and (*Egretta garzetta*), Whimbrel (*Numenius phaeopus*) and Sanderling (*Calidris alba*) (URT, 2005d).

#### 4.1.5 Marine and coastal resources

The coastal zone of the Dar es Salaam is comprised of a complex mixture of beautiful sandy beaches, beach rocks as well as rock cliffs and platforms, islands fringed by coral reefs, numerous coral patch reefs, estuaries streamlined with mangrove forests, and lagoons with sea grass beds covering large areas (Kairu and Nyandwi, 2000). About eight mangroves species can be found along the beach areas of the city, namely; *Rhizophora mucronata* ('Mkoko' in Kiswahili), *Sonneratia alba* ('Mlilana' or 'Mpira'), *Avicennia marina* ('Mchu'), *Ceriops tagal* ('Mkandaa'), *Bruguiera gymnorrhiza* ('Msinzi' or 'mshinzi'), *Heritiera littoralis* ('Msikundazi or Mkungu'), *Lumnitzera racemosa* ('Kikandaa' or 'Mkandaa dume') and *Xylocarpus granatum* (Mkomafi') (URT,2011).

There are over 2,266 ha of mangrove forests distributed throughout the coastal area (NEMC, 1995). They serve as a natural defense, a nursery for many species and provide physical habitat for numerous fish, crustacean and many varieties of important species, but they are a threatened resource due to unregulated use. They are cut and used by local people for construction, export, firewood, charcoal making, boat building and salt making and avail land for rice farms. Indirect impacts of environmental degradation include reduction in tourism, fisheries, recreation, and other ecological and productivity impacts.



**Map 4: Vegetation cover of Dar es Salaam**

Source: *IRA GIS Lab, 2017*

The city has about 88 species of hard coral species belonging to 34 genera. There are about 12 species of sea grasses in the coastal waters occupying much of the shallow lagoon between the islands and the mainland along the entire coast (URT, 2011). The city coast is home to a number of endangered species such as marine turtles, hawksbill (*Eretmochely imbricata*) and green turtle (*Chelonia mydas*) dolphins, Sea Turtle, humpback whales and whale sharks (URT, 2011). Fishing is one of the major economic activities along the coastal areas, and is mainly done for both subsistence and commercial purposes. Fishes of commercial importance to local communities include Siganidae, Lutjanidae, Lethrinidae, Scaridae, Labridae, Acanthuridae, Mullidae, Haemulidae, Serranidae, and Dasyatidae (Kamukuru, 2005). Kindondoni Municipality has one standard fish market at Kunduchi area and many other non- official markets near the sea.

#### **4.1.6 Wetland resources**

The Dar es Salaam has a number of beautiful beaches including the Oysterbay, Mbweni, Ndege beach, Ununio, Kunduchi and Buyuni beaches. In the northern coast between Msasani bay and Mbweni is an area of sensitive sand beach ridges mainly used as tourist attraction (URT, 2011). There are two bays within the region which include the Msasani Bay and Oyster Bay. Also there are several smaller estuaries, some of which occur along seasonal streams. Several of these estuaries support mangroves and/or sea grass beds. Although there are no significant wetland resources in area, pollution of feeder streams could result into pollution of these resources. The main threat to these resources is pollution mainly from residences, industries as well as from other activities like construction activities.

#### **4.1.7 Sea level rise and coastal erosion**

The problem is seriously along the Kunduchi beach. Kunduchi beach and Bahari beach in Dar es Salaam have been eroded such that heavy investment had to be made to make them continue operating. At Kunduchi the headwater waves has advanced for about 200m in the last 50 years; as a result, a mosque and five residential houses were washed away as well as destroying historic fish market constructed in 1970s (WWF 2004). Africa hotel constructed 1967 has been destroyed and is no longer operating. Transport sector is one of the sectors which have been frequently affected by sea level and coastal erosion. For example, the sea wall constructed Aga Khan to protect Ocean road has been eroded hence threatening the sustainability of the road.

#### **4.1.8 Land resources**

The land use categories in Dar es Salaam comprised of informal settlement areas, planned residential areas, ocean and estuaries as well as open areas/spaces Others includes industrial and recreation areas. Urban Land Use Planning and Management is governed by the Urban Planning Act 2007. The law provide for public consultation in the preparation of land use schemes and the making available to the public, all approved schemes. However rapid urban growth under poverty has outstripped the capacities of planning authorities to cope with the enormous pace of urban expansion. Additionally,

the impact of formal planning in Dar es Salaam is very limited as the latest master plan approved dates back to 1979. As a consequence informal settlements absorb large proportions of the urban dwellers leading to rapid urban sprawl into the unplanned periphery and the emergence of informal sub-centres in peri-urban areas. The urban structure of Dar es Salaam resembles a four finger pattern following the four major trunk roads. Informal urban sprawl in Dar es Salaam can be described as a diffusion process progressing in wave-like concentric rings from the city centre towards the periphery of the city in combination with broadening ribbons following the trunk roads (see Figure 1) (Hill & Lindner 2009).

Urban growth in Dar es Salaam is mainly driven by informal residential location decisions of both, the urban poor as well as medium- and high-income groups. Despite intensive densification and consolidation processes in existing settlements, most of the urban population growth is accommodated on formerly vacant or agricultural land.

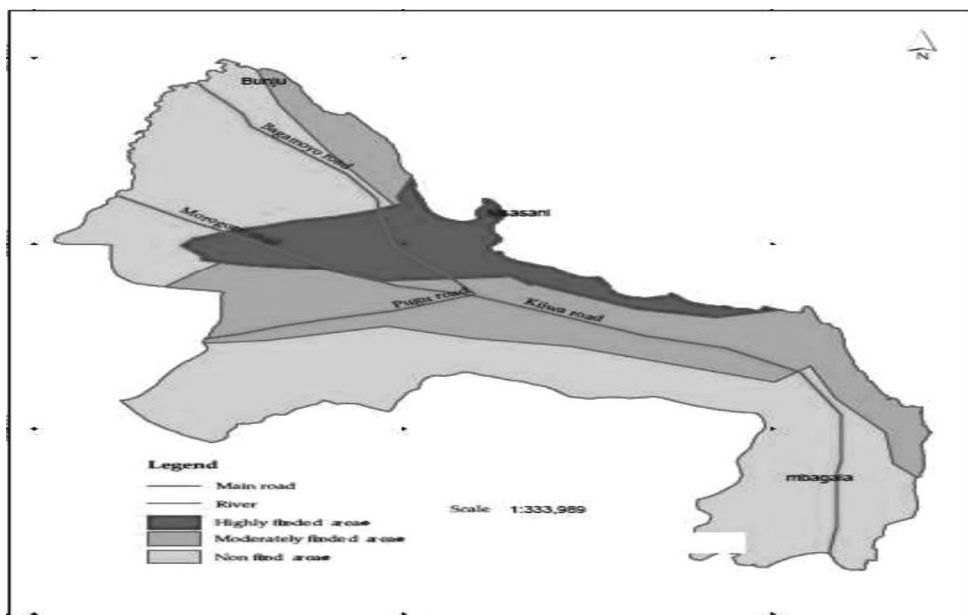
The Ministry of Lands Housing and Human Settlement Development has been mounting major planned land provision schemes in the city of Dar es Salaam. These have been mainly in peri-urban areas. A number of other local authorities are being enabled to implement schemes for planned urban development. Long-term land use plans are being prepared for many as well. However, the approach is still that of a Project. The number of the lots being delivered is limited and does not cover the whole spectrum of the potential urban land seekers especially those in the lower income categories. As a result, the city is continuing to depicting a picture of planned land use islands on a mosaic of informal land use development, where the poor seem to be destined for unplanned areas.

Currently the city of Dar es Salaam has no reserve land for new development therefore planning of the city would require Redevelopment Scheme, involving government and public decision on their areas and cooperation on the new plan.

#### **4.1.9 Water resources**

Dar es Salaam lies within an increasingly water scarce catchment. Map 4 shows the main surface water drainage areas in the city. They include Ng'ombe (Sinza) River in Kinondoni; Kizinga River, Yombo River and Gerezani Creek in Temeke; and Msimbazi

River and Yombo river in Ilala. Almost all these rivers and creeks are largely seasonal, tending to flood during the wet season and dry up in the dry season. Dar es Salaam City's vulnerability to floods is mainly caused by poor infrastructure which lead to the poor sewage system and this makes floods whenever there is rain, no matter how big rain. The areas which have been frequently affected by floods includes: Msasani Bonde la Mpunga, Msimbazi Valley, Jangwan Valley, and the City Center. The flood prone areas in Dar es Salaam are shown in Figure xx. Generally, the main source of water (95%) in Dar es Salaam, is the Ruvu river from the Udizingwa Mountain catchment. while very little (5%) comes from groundwater sources both shallow and deep wells.



**Map 5: Flood prone areas in Dar es Salaam**

Source: *Climate Change and Urban Vulnerability in Africa (CLUVA) 2013*

## 4.2 Socio-Economic Baseline

### 4.2.1 Population distribution

Dar es Salaam is the largest city in Tanzania. With a population increase of 5.6 percent per year from 2002 to 2012, the city is the third fastest growing in Africa (ninth fastest in the world), after Bamako and Lagos. The metro population is expected to reach 5.12

million by 2020 and predicted to be as high as 76 million by the year 2100, making Dar Es Salaam the second largest city on earth (after Lagos), by 2100.

According to the 2012 national census, the Dar es Salaam region had a population of 4,364,541, which was much higher than the pre-census projection of 3,270,255. For 2002–2012, the region's 5.6 percent average annual population growth rate was the highest in the country. Hosting about 10% of the national population, the city contains about 29% of the country's urban population. It was also the most densely populated region with 3,133 people per square kilometer. Of the five municipalities, Ilala and Temeke had the highest population of about 1.2 million inhabitants, followed by Kinondoni, Ubungo and Kigamboni (Table 2 and Figure 1). The relatively high population growth rate is attributed partly to an influx of people towards urban areas (coastward migration) and increasing birth rate, and more significantly by transient population (about 1million annually). On average, 16% of the city populations are migrants from other places in Tanzania.

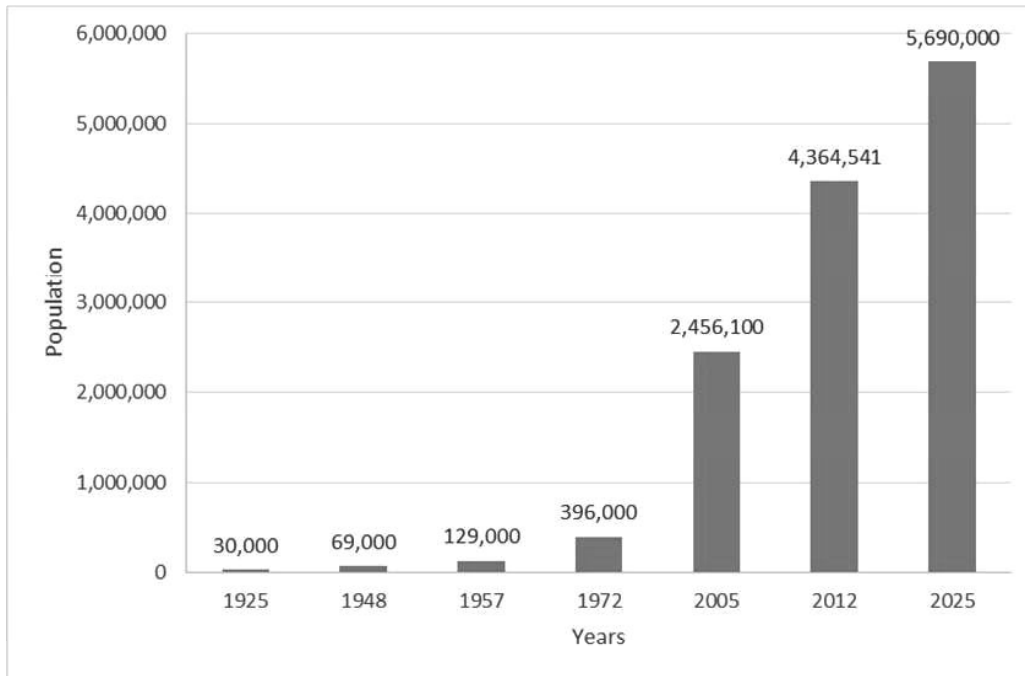
**Table 2: Population Characteristics of Dar es Salaam City**

Municipality	Population (Based on Population Census, 2012)			Average Household Size	Land Area in km <sup>2</sup>	Population Density per Km <sup>2</sup>
	Male	Female	Total			
Kinondoni	444,031	469,903	913,934	4.0	270.6	3,383.7
Ilala	595,928	624,683	1,220,611	4.0	273.0	4,471.1
Temeke	587,857	618,092	1,205,949	3.9	370.5	3,254.9
Kigamboni	81,199	81,733	162,932	3.9	416.0	391.7
Ubungo	416,771	444,344	861,115	4.0	260.40	3,311.9

Source: *Tanzania Population and Housing Census, 2012 and Municipal Socio-economic Profiles*

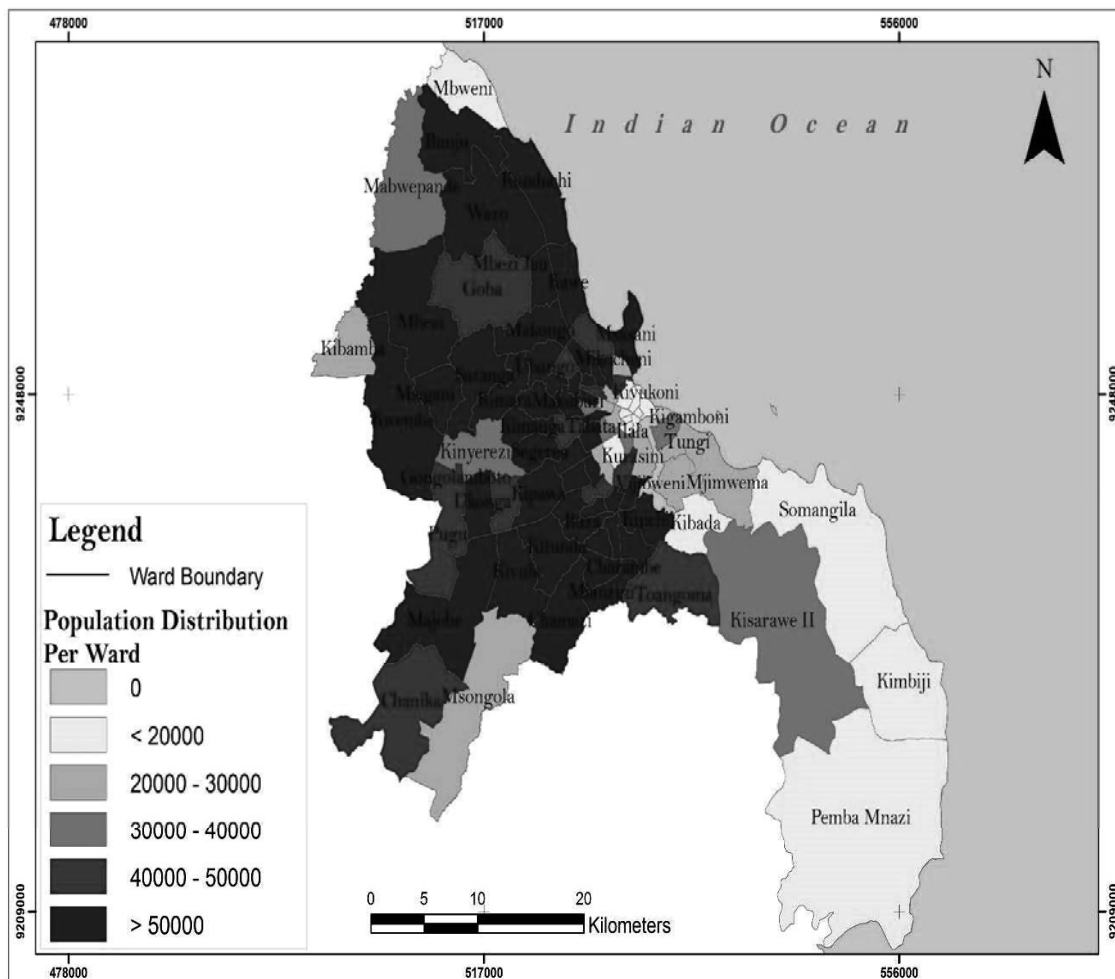
Birth rate is estimated at 4.5% per annum. Figure 1 shows the historic change in population from 1925 to 2025 (projected), and illustrates the rapidly growing population in the city, which increased by a factor of about 46 over the last six decades. It also suggests a continuing rapid growth trend into the future.





**Figure 1: Population Growth Trend of Dar es Salaam from 1925 to 2025 (projected)**

Source: *Tanzania Population and Housing Census 2012 and National Bureau of Statistics.*



**Map 6: Population Distribution in Dar es Salaam City by Wards**

Source: *Tanzania Population and Housing Census, 2012 and IRA GIS Lab, 2017*

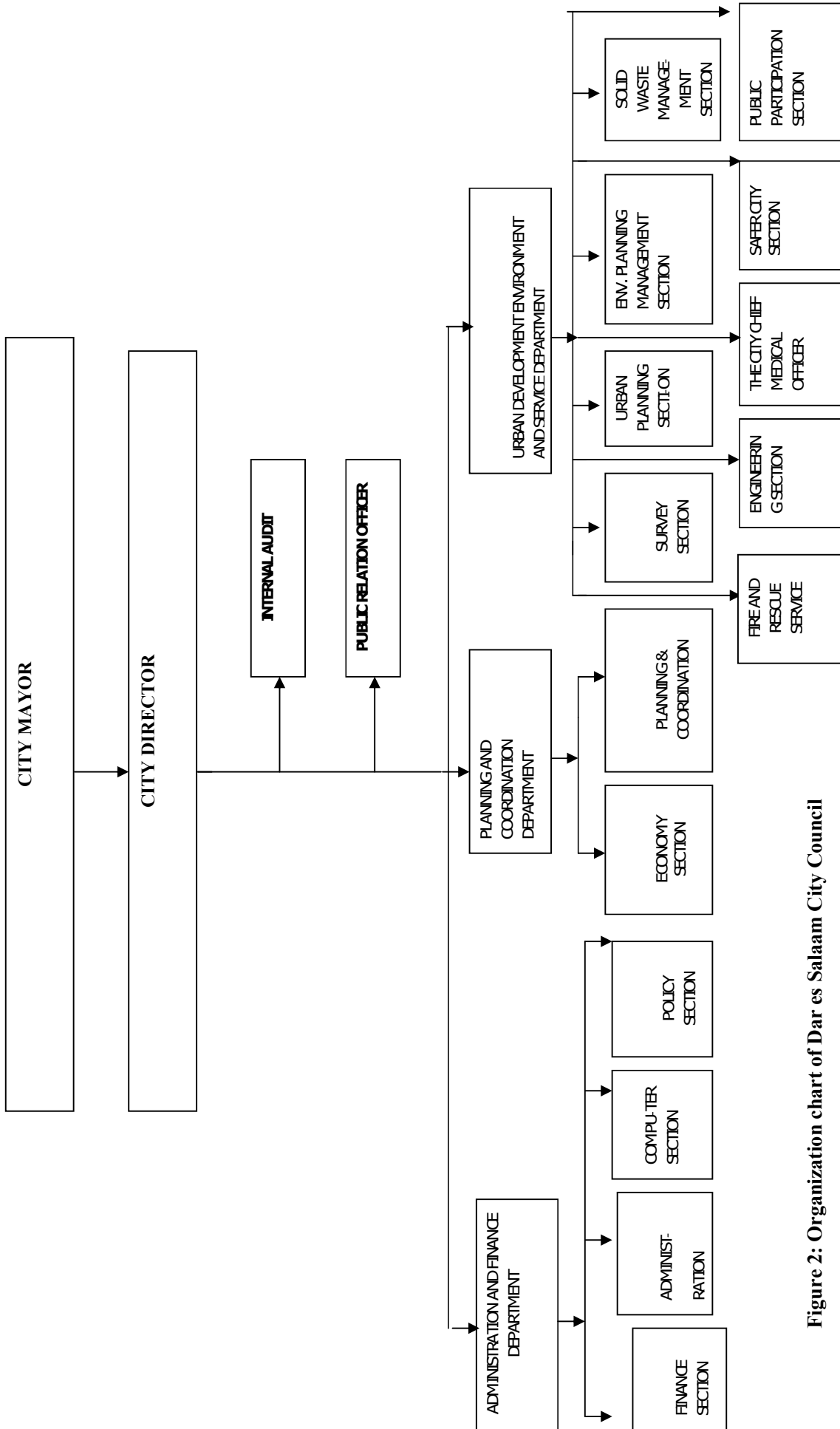
The rapid population growth and urbanization of the City has far overstretched the already provided urban infrastructure and services. The expansion of the City has not coped with the provision of the necessary infrastructure and social services including roads, transport, water systems, sanitation, educational facilities and health services. Most of infrastructure were made to meet the demand of the 1980’s and 1990’s. To date, the increased demand for food, water, access, serviced land, sanitary management of solid and liquid wastes remains largely unmet resulting in various environmental hazards, (Vice President’s Office, 2011).

Most of the city's growth has occurred along the central and northern part of the coastline with a great majority of the population living in unplanned and informal settlements; and according to UNHABITAT (2009), the city has now one of the highest proportions (over 65%) of informal-settlement households in East Africa. The spatial population distribution (based on the 2002 census data report) in the city shows that the unplanned settlement is concentrated mainly on the Kinondoni district, followed by the Ilala district, where the Tandale ward (in the Kinondoni district) has the highest inland population density of more than 42,000 people per km<sup>2</sup>. However, in terms of ward population distribution, the Vingunguti ward (in the Ilala municipality) has the highest population of about 106,946 people, followed by Segerea and Kiwalani with 83,315 and 82,292 people respectively (Figure 6)

#### **4.2.2 Administrative structure of Dar es Salaam City**

A mayor and an executive director/city director head the Dar es Salaam City Council. The city director is in charge of the following departments: Waste Management and Sanitation, Engineering and Fire Services, Urban Planning, Transportation, Environment, Health, and Finance and Administration. The city administration is further divided into five municipalities, namely, Kinondoni, Ilala, Temeke, Kigamboni and Ubungu. A District Commissioner heads each municipality. The city council is responsible for creating the strategic city framework and for formulating city legislation. Each municipality has its own municipal council, headed by a Mayor and an Executive Director. There are five municipal directors appointed by and accountable to the Minister of Regional Administration and Local Government. At the lower administrative levels, there are ward and sub ward (*Mtaa*) leaders and in some areas there are also hamlets (*vitongoji*), all appointed by and accountable to the Municipal Director. The major sources of finance include, but are not limited to, property taxes, city service levies, advertisement and billboard levies, market duties, grants, donations, government subsidies, and community contributions.

**ORGANIZATION CHART FOR DAR ES SALAAM CITY COUNCIL**



**Figure 2: Organization chart of Dar es Salaam City Council**

### 4.2.3 Economic activities

- **Industrial production and business**

Dar es Salaam is Tanzania's most important city for both business and it used to be the capital city Tanzania before the capital was officially moved to Dodoma in this year (2017). The city contains high concentrations of trade and other services and manufacturing compared to other parts of Tanzania, which has about 80 percent of its population in rural areas. The city accommodates about 40% of the total industrial manufacturing units in the country and contributes about 45% of the nation's gross industrial manufacturing output. The port of Dar es Salaam also plays a significant role for the city's, and hence the nation's economy. The port handles about 95% of Tanzania's international trades, also serves the landlocked countries of Malawi, Zambia, Democratic Republic of Congo, Burundi, Rwanda and Uganda (Tanzania Ports Authority, 2009).

The Central Business District area includes small businesses, many of which are run by traders and proprietors whose families originated from the Middle East and Indian sub-continent—areas of the world with which the settlements of the Tanzanian coast have had long-standing trading relations.

The Dar es Salaam Central Business District made up of Kisutu, Kivukoni, Upanga and Kariakoo. All three areas making up the downtown are found in the Ilala district. Kivukoni has the city's important fish market, the Magogoni fish market. Kivukoni also is the place where the Tanzania's central bank, The Bank of Tanzania is located, so is the Dar es Salaam Stock Exchange. Kisutu has businesses and offices and is the location of Dar es Salaam central railway station, the Public Service Pension Fund (PSPF) Towers and the Tanzania Ports Authority (TPA) tower. Kariakoo is the prominent shopping area with streets like Congo Street for clothing shops. Uhuru Street is for computers and electronics, while Msimbazi is for mobile phones.

Due to the growing economic activities, Dar es Salaam is expanding faster. In the coming few years, it is expected to expand even more and economic activities will increase, especially in Kigamboni municipality where, the site area has a strong presence with

large tracts of good, unexploited land. According to various studies on the presence of unpolluted beaches, the redevelopment of Kigamboni will spearhead economic development and increase the national income. The big picture of the Kigamboni new city master plan is to provide sufficient infrastructure in order that the residents have a better quality of life and to build a core for developing new land demands of Dar es Salaam, such as residential, commercial, trade and business, industrial, educational, and tourism facilities.

The two sectors contribute over 80 percent of the Dar es Salaam economy and employs about 90 percent of the workforce in the Region (Dar es Salaam City Profile, 2004). The major productive sectors include agriculture, livestock, fisheries, forestry, cooperatives, tourism, mining and industries. However, Poverty and Human Development Report (PHDR) of 2009 indicated that about 20 percent of Dar es Salaam residents were living below poverty line.

- **Agriculture**

Agriculture is however the main activity within the region. A total of 110,850 ha (52,000 ha in Kinondoni, and 13,850 ha in Ilala) of land has potential for agriculture practices, of which over 52% is already in use (Dar es Salaam City Council, 2004). Crop cultivation is dominant in Dar es Salaam (Jacobi 1997, Tesha 1996). Leafy vegetables are in high demand, because they are part of the traditional diet. Eggplant, sweet and hot pepper, okra and tomato as well as fruits like oranges, mangoes, banana, papaya and pineapple are produced in the peri-urban area. Occasionally, green maize and rice is produced in the inner city during the long rainy season; otherwise, staples come primarily from peri-urban or rural areas.

Cattle, goats and chickens are kept in close vicinity to urban settlements. While cattle are kept exclusively by medium and high-income groups either in the peri-urban areas or in low-density settlement areas, goats and chickens are affordable to all income groups. The number depends on family income. Current cattle population in Dar es Salaam is projected at 34,000 cattle, 12,500 goats, 1,500,000 poultry and 5,000 pigs (MoAC 1999).

However, the land use is rapidly changing from agriculture to built-up areas (Kombe, 2005).

- **Fishing**

Fishing is very important in DSM for employment, family food supply and for animal feed. Fishing methods include freshwater fishing, marine fishing, dynamite fishing and beach seine. *Freshwater fishing* is mainly for household consumption. Few lakes and ponds are used for inland fisheries resources in Mikocheni, Kawe, Kimara, Tegeta, Boko, and Pugu. Existing lakes include Luhanga, Makurumula, Msimbazi River and Tandale. No data is available for the actual catch. *Marine fisheries* employ more than 3000 men in villages such as Mbweni, Ununio, Kunduchi, Kawe, Kimbiji, Mjimwema etc. The main types of fishnets are gillnets, shark nets, sieve nets, hand lines and traps. *Beach seine* is practised mostly by small-scale fishermen with canoes or small boats who fish in shallow waters.

- **Quarrying/mining**

Sand, stone, limestone and clay are extracted in key locations for building and construction purposes. Salt is mined in the shore for domestic consumption. Approved sand quarrying areas include Majohe and Bunju, with other more urban areas where mining is carried out unofficially such as Kawe, Mbezi beach, Tegeta, Boko & Tabata. Stone is mainly extracted from Kunduchi, Mjimwema, Boko, Bunju and Kigamboni quarries, supplemented by small scale family operations in disused quarries scattered throughout the urban area, especially in Msasani, Oyster bay & Masaki. Limestone is quarried from Wazo /Kunduchi outcrops for the Tanzania Portland Cement Company Ltd. at Wazo Hill cement factory. Clay is extracted from upper Msimbazi river valley for the manufacturing of bricks.

#### **4.2.4 Water supply and availability**

Water supply to Dar es Salaam comes from three sources. The main source is the Ruvu River which is exploited at two different works; the Upper Ruvu Works (Source 1) and

the Lower Ruvu Works (Source 2). Others are underground sources being boreholes, shallow wells and deep wells. All plants have the capacity of supplying 300,000 M<sup>3</sup> per day compared to the demand of 450,000 M<sup>3</sup> per day (about 67 percent). However, about 50% of supplied water is lost due to dilapidated infrastructures.

The Ruvu River originates in Morogoro region deep in the Uluguru mountains and pours into the Indian Ocean at a place called Bagamoyo, some 80 kilometers North West of Dar es Salaam. However, the dry seasons usually lower flows to environmentally dangerous levels where full abstraction cannot be achieved (Kjellen, 2006). The third source, the Mtoni Water Works, a small treatment works developed during the colonial era has also been recently renovated ( as part of the DWSSP Project) and provides an additional supply to the city.

**Table 3: Main Sources of Water Supply in Dar es Salaam**

Source	Amount Supplied in m <sup>3</sup> /day
Upper Ruvu Transmission	68,792
Lower Ruvu Transmission	176,626
Mtoni	107,223
Overall	260,881

Source: *HH Audit Report, 2010*

Dar es Salaam, the responsible Authority for water supply and sanitation is the Dar es Salaam Water Supply and Sewerage Authority (DAWASA). DAWASA functions as the owner of the water supply and sewerage infrastructure but contracts out its business function (water distribution, sewerage collection, and bills collection) to a public limited company; Dar es Salaam Water Supply and Sewerage Corporation (DAWASCO).

- **Water problems**

The tumultuous state of Dar es Salaam's water supply is no secret, especially after a failed privatization attempt (2003 - 2005) brought it international notoriety. The problem is further compounded by unplanned settlements mainly in the form of slums where it is believed that up to 75% of the city's population lives (Vestebro in Kjellen, 2006). This untamed population growth along with poor planning has had severe consequences on the



City's already dilapidated infrastructure notably the water supply infrastructure. Figure 3 presents the governmental statistics showing the disparity between the demand and the supply during the reporting years 2007/2008 and 2008/2009 (MoWI, 2010; EWURA, 2012).

The demand of 310 million m<sup>3</sup>/year against an average production of 200 million m<sup>3</sup>/year implies that only 64% of the demand is actually met. However, it is thought that even the shown estimates are on the optimistic side. HH Audit Report (2010) notes that the current production for the year 2008/2009 was only 260,88m<sup>3</sup>/day (95.2 million m<sup>3</sup>/year) less than half of the demand and moreover over 55% of it is lost either through leakages or not accounted for (Non-revenue water) as can be seen in Table 3.

The majorities of households in Dar es Salaam get water either from neighbors or water kiosks and carry them on their heads in plastic containers or hire someone else to do it (Kjellen, 2006). The official figures put the number with access to clean and safe water at 63 % of the population although the actual values are believed to be much lower (Kjellen, 2006) with the WB estimating the value at anywhere between 48% and 69% (WB, 2010).

- **Responses to water problems**

The current response to the water problems in Dar es Salaam has been to look for new water sources. The main sources being explored so far are; development Kimbiji and Mpera well fields on the Kimbiji aquifer and the expansion of the production capacity of the Lower Ruvu treatment works, which involves the construction of the Kindunda dam, which is largely contested on environmental and social grounds (HH Audit Report, 2010).

#### **4.2.5 Education**

Dar es Salaam has several pre-primary schools, primary and secondary schools. There are also a number of higher learning institutions such University of Dar es Saalam, Ardhi University and many other institutions. Due to rapid population increase, education sector in the project is facing several challenges including shortage of desks, teachers and textbooks. Availability of teachers is also a problem because many pupils cannot access the teacher due to high teacher to pupil ratio.

With regard to the level of literacy, available statistics shows that Kinondoni district have high rate of literacy (88 percent) among the population aged 5 years and above. The same situation was experienced in Ilala district where the literacy rate was 89 percent among the population aged 5 years and above. Literacy in Kiswahili stood at 62 percent while 25 percent were literate in both Kiswahili and English. Furthermore, literacy rate was highest among those aged between 10 and 19 years. Literacy was also higher among the urban population than the rural (Kinondoni and Ilala District Profile, 2014)

#### **4.2.6 Health conditions and facilities**

In this area health facilities are located in various parts of the area comprising both informal and formal health establishments. Despite improvements in medical practice, the informal sector still plays an important role in the community. The formal sector is run by various institutions including the Government, voluntary agencies, parastatal and other private organisations.

According to Temeke Municipal Council of 2011 (including Kigamboni), the municipal had a total of 117 health facilities which are Public and Private. Among these facilities 33 were Public facilities, two hospitals, one health centre, 28 dispensaries and two RCH Clinics. There were 84 private facilities, of which hospitals are two, five health Centres and 77 dispensaries. In Kinondoni municipal council, which formally included Ubungo municipal council had a total of 126 health facilities, of which one was owned by the government and 12 owned private institutions. There were 10 health centers, of which one was owned by the government and nine owned by private institutions. There were 103 dispensaries which included 25 and 78 dispensaries owned by the government and private institutions respectively (KMC, 2014).

The major prevailing diseases in Dar es Salaam include Malaria, HIV/AIDS and Acute Respiratory Infections. Data from Konondoni Municipal Council revealed that for the year 2014, a total of 378,477 cases of Malaria were reported from health facilities, among which, under five cases were 93,602. Total reported deaths due to severe Malaria were

5,981. Total maternal death was 39 whereby most causes were due to post partum haemorrhage, anemia and eclampsia and neonatal mortality was 1,605.

Statistics from Temeke Municipal Council (2011) revealed that, outpatient ten top diseases for under five years of age were Malaria, ARI, Diarrhea diseases, Intestinal worms, Eye Infections, UTI, Pneumonia, Skin Infections, Minor surgical conditions and Anaemia. In patient ten top diseases for under five years of age are Severe Malaria, Severe Anaemia, Severe Diarrhea, Severe Pneumonia, Bronchial Asthma, Burns, UTI, Clinical AIDS, Poisoning, and ARI. In patient ten top diseases for age of five years and above are Severe Malaria, Severe Anaemia, Clinical AIDS, and Complications of Pregnancy

Despite the government efforts to control the transmission of HIV at different levels in Dar es Salaam, the disease still features among the top ten diseases accounting 4.7 percent of HIV/AIDS prevalence in the country (Tanzania AIDS Commission, 2017). Traditional and cultural beliefs and practices contribute to the rapid spread of the pandemic. Not only do they promote harmful initiation practices that increase the chances of infection, they also stigmatize those people already infected. Efforts are needed to protect the most vulnerable groups affected, particularly women and children.

#### **4.2.7 Transport**

Urban public transport services in the city mainly depend on road transport services (Howe & Bryceson, 2000). Reliance on road based transport services coupled with high growth of transport demand has led to inadequate supply of transport services and increased dependence on use of private cars and consequently road congestion and poor traffic flow management (Kumar et al, 2008).

Public transport in Dar es Salaam City is generally poor and unsafe, lacking professionalism, efficiency, quality and safety for the passengers. The main factors leading to the above situation include; rapid expansion of the City which has far outpaced

the capacity to provide basic infrastructure (such as good roads) and services, poor state of majority of the buses, untrained bus drivers and conductors driven by the pursuit of daily revenue targets payable to the bus owners, non-adherence to traffic rules and regulations and lack of an organized public transport system. Public transport service is dominated small buses called Daladala, of which there are about 9,000 of these Daladala, with capacities ranging from 16 to 35 passengers (SUMATRA, 2009, Ilala Municipal Council, 2009). The service offered is poor due to overloading and overcrowded buses particularly during peak hours, reckless driving, route shortening, harassment of women and schoolchildren and polluting vehicles particularly during peak hours dominated by traffic jams on most major roads in the City.

#### **4.2.8 Waste management**

A reliable municipal solid waste collection, transportation and disposal system is the cornerstone for good quality waste management services. The responsibilities for city cleaning, waste collection and treatment are distributed between the DCC (Dar es Salaam City Council) and the five municipalities. In general it can be stated that the municipals are responsible for city cleaning, waste collection and fee collection at the households and the markets. DCC is responsible for providing an adequate treatment infrastructure.

Dar es Salaam waste is estimated to be about 4,600 tons per day at a generation rate of 1kg/day/household. By source, 73.6% of waste generation is from the domestic activity, 3.3% is from market activity, and 23.1% is from other sources. The domestic waste is composed of kitchen waste (39%), recyclables (31%) such as paper, plastic, metal and glass, combustibles (31%) such as textile, grass, wood, leather, rubber etc., and non-combustibles (6%) like ceramic and stones (SMEC 2013). In general waste production is firmly related to GDP and in fact both show equal growth rates. Taking into account Tanzania's development status, DSM's economic and industrial importance and the fact that the country's rural economy is lagging behind in this national GDP growth, it is safe to assume that Dar es Salaam will show an annual waste growth of close to or even over 10% rather than the 3% mentioned above.

The waste is collected by both community based organizations (CBOs) and private companies. CBOs are more employed in unplanned areas of the city while the private companies are more prominent in city centers and in the markets. CBOs usually collect waste at community collection points or along the roadside for easy transportation but the municipal vehicles and private companies usually collect waste and send them directly to the disposal site. The current collection system largely goes without segregation of waste and with little re-cycling and small scale composting. Final disposal takes place at Pugu Kwamnyamwezi dump site. This dumping is highly unhygienic and poses serious threat to occupational safety environment and public health.

The sewerage system currently serves only 13 per cent of Dar es Salaam residents, mainly in the city centre, thus posing a serious challenge to environmental conservation. Sludge from septic tanks and pit on latrines is discharged into wastewater stabilization ponds. However, there are no facilities for handling sludge from the waste stabilization pond. Furthermore, most areas, including much of the city centre have no formal storm water drainage system. The drains are frequently used for waste water which thus reaches the natural drainage system without treatment.

#### **4.2.9 Impact of climate change**

Dar es Salaam is highly vulnerable to climate change, which is associated with floods, sea level rise and coastal erosion, water scarcity and outbreak of diseases. This vulnerability is largely contributed by: poor planning (approx. 70 % of settlements are not planned); poverty (people encroaching in hazardous lands); inadequate or lack of infrastructure (existing infrastructure such as e.g. storm water drainage system is not proportional to the population size); and the closer location to Indian ocean. The intensive urban development (in terms of housing, roads and other, developments) in Dar es Salaam have greatly increased the amount of runoff water and at the same time reduced the surface area, which can absorb the runoff through ground seepage. This situation is compounded by the fact that all three municipalities lack adequate drainage network, particularly in suburban areas. Since the existing drainage systems are over 20 years old,

most drains no longer serve their purpose due to misuse such as garbage dumps and lack of maintenance. In addition, in most of the sub-wards, drainage is poor partly because roads, for which storm water drainage is normally provided, are in poor state. For example, in some cases existing roads have no/or irregular storm drains. In other cases, the available storm drains are not lined and are of inadequate capacity .

### **4.3 Cultural and Archaeological Environment**

This section presents briefly the status of cultural and archaeological heritage of the program area. Dar es Salaam is one of the regions endowed with a lot of cultural heritage sites as well a few archaeological sites. It has the largest number of gazetted cultural heritage monuments; there are 29 gazetted cultural heritage sites. There is a one-gazetted monument in Temeke and Ubungo municipals respectively, three are located in Kinondoni municipal and 23 are located in Ilala municipal (a list of all the gazetted monuments in this region is attached). The Antiquities Act No. 10 of 1964 and its amendments Act No. 22 of 1979 protect all the gazetted cultural heritages.

Besides gazetted cultural heritage sites, there are 191 that are registered, non- gazetted cultural heritage sites scattered in the five municipals of Dar es Salaam. In terms of distribution, there are 181 cultural heritage sites in Ilala, six cultural heritage sites are located in Kinondoni, two cultural heritage sites are located in Temeke and one cultural heritage site is located in each Ubungo and Kigamboni. The Antiquities Act No. 10 of 1964 and its amendments Act No. 22 of 1979 also protect all the registered, non-gazetted cultural heritages as they might be in the process of being gazetted. Some of the cultural heritage sites are also protected by Municipal bylaws. There are also archaeological sites in Kigamboni: Mbwa Maji and Mji Mwema. The former is an Early Iron Age site and the latter is Later Iron Age site.

It is advised that while implementing DARTMP efforts be made to ensure that gazetted and non-gazetted cultural heritage sites are not affected by the program or affect the program. As noted above, the laws of the land particularly the Antiquities Act protect these sites.

## **5.0 STAKEHOLDER'S ENGAGEMENT AND PARTICIPATION**

### **5.1 Tanzanian Requirements**

Stakeholder's engagement and higher levels of participation are practices which have been considered as crucial steps to obtain successful results in environmental assessments, EIA and SEA (Young, et. al., 2013). Complementarily, there is a special interest for involvement of stakeholders in the urban planning processes, aiming to make influence in the content of plans Lydia Lamorgese, & Davide Geneletti (2013b). The Stakeholders and Public Consultation process is specifically governed by Part XIV of the Environmental Management Act No. 20 of 2004 which provides directives on public participation in the environmental decision - making processes.

Public consultations and stakeholder involvement are a legal requirement in Tanzania's SEA regulations. Part XIV of the Environmental Management Act No. 20 of 2004 provides directives on public participation in the environmental decision making processes. Section 178 (1) of the act provides further directives on the right of the public to information and participation in decision making, and states that public shall have the right to be informed in a timely manner of the intention of the public authorities to make executive or legislative decisions affecting the environment and of available opportunities to participate in such decisions. The Environmental Impact Assessment and Audit Regulations, 2005 PART IV section 17 among others states the following:

- i. During the process of conducting an environmental impact assessment study, the developer or proponent shall in consultation with the Council, seek the views of any person who is or is likely to be affected by the project.
- ii. In seeking the views of the public following the approval of the project brief, the developer or proponent shall-
- iii. Publicize the project and its anticipated effects and benefits by-
  - a) Posting posters in strategic public places in the vicinity of the site of the proposed project informing the affected parties and communities of the proposed project.

- b) Publishing a notice on the proposed project for two successive weeks in a newspaper that has a nationwide circulation; and
- c) Making an announcement of the notice in both Kiswahili and English languages in a radio with a nationwide coverage for at least once a week for two consecutive weeks;
- iv. Hold, where appropriate, public meetings with the affected parties and communities to explain the project and its effects, and to receive their oral or written comments;
- v. Ensure that appropriate notices are sent out at least one week prior to the meetings and that the venue and times of the meetings are convenient for the affected communities and the other concerned parties; and
- vi. Ensure, in consultation with the Council, that a suitably qualified coordinator is appointed to receive and record both oral and written comments and any translations of it as received during the public meetings for onward transmission to the Council.

## **5.2 JICA Requirements**

JICA's definition of SEA is simple and thus the actual implementation is flexible depending on the country and the plan concerned. Therefore, SEA under JICA also specifies the importance of stakeholder's engagement through meetings and ensuring that stakeholders meetings are disclosed through meetings and any other possible mechanisms. The following procedure is indicated as the standard procedure under the New JICA Guidelines

- i. In principle, project proponents etc. consult with local stakeholders through means that induce broad public participation to a reasonable extent, in order to take into consideration the environmental and social factors in a way that is most suitable to local situations, and in order to reach an appropriate consensus. JICA assists project proponents etc. by implementing cooperation projects as needed.



- ii. In an early stage of cooperation projects, JICA holds discussions with project proponents etc. and the two parties reach a consensus on frameworks for consultation with local stakeholders.
- iii. In order to have meaningful meetings, JICA encourages project proponents etc. to publicize in advance that they plan to consult with local stakeholders, with particular attention to directly affected people.
- iv. In the case of Category A projects, JICA encourages project proponents etc. to consult with local stakeholders about their understanding of development needs, the likely adverse impacts on the environment and society, and the analysis of alternatives at an early stage of the project, and assists project proponents as needed.
- v. In the case of Category B projects, JICA encourages project proponents etc. to consult with local stakeholders when necessary.
- vi. JICA encourages project proponents etc. to prepare minutes of their meetings after such consultations occur.

The public participation process for this SEA was a crucial mechanism to inform the public, interested and potentially affected people about the need for, purpose and aims to review the Dar es Salaam Transport Master Plan, but also served to elicit the issues, concerns, needs and requirements of interested and affected people as input into the SEA.

The objectives of the stakeholders and public participation process included:-

- i. Provides an opportunity for people involved to obtain clear, accurate and comprehensive information about Dar es Salaam Transport Master Plan, its alternatives or the decision and the environmental impacts thereof;
- ii. Provides people involved with an opportunity to indicate their viewpoints, issues and concerns regarding the DARTMP, alternatives and /or the decision;
- iii. Provides people involved with the opportunity of suggesting ways of avoiding, reducing or mitigating negative impacts of an activity and for enhancing positive impacts;

- iv. Enables the applicant to incorporate the needs, preferences and values of affected parties into the activity;
- v. Provides opportunities to avoid and resolve disputes and reconcile conflicting interests; and
- vi. Enhances transparency and accountability in decision making

### **5.3 Stakeholder identification, analysis and involvement**

#### **5.3.1 Stakeholder's identification**

The key stakeholders were identified among the governmental sectors, transport service users, transport service providers and non-governmental organizations (NGOs). In consultation with JICA Study Team, key stakeholders were prioritized by the SEA team based on the degree to which the stakeholders can influence and affect the success of the plan as well the importance or the degree to which a stakeholder stands to lose or gain from the plan.

#### **5.3.2 Stakeholders analysis**

A thorough understanding of stakeholders—who they are, what their concerns may be, what interests they have, is required in any SEA process. In this SEA the objective was to permit relevant stakeholders to participate in decision making and keep the general population informed about the reviewed Dar es Salaam Transport Master Plan. The process of identifying stakeholders entailed reviewing the databases of key government ministries and institutions, public and private sectors as well Non-Governmental Organizations and identifying and listing stakeholders who will be affected by the Transport Master Plan to be fully representative of the wider stakeholder interests.

Dependent upon the issues and organizations/institutions involved, it is likely that different groups will be invited to engage in the process in different ways. In recognition of this, three basic stakeholder groups have been identified, together with the methods and merits of involving each group.

These groups are:

- i. Client Stakeholder's Group
- ii. Key Stakeholder's
- iii. Other Stakeholders

The three groups facilitate varying degrees of stakeholder involvement in the development of the SEA offering differing levels of influence that stakeholders could exert in influencing the outcome. In general, the groups do not represent different stakeholders (i.e. the same interests could be represented on different groups on different SEA), rather the nature of the involvement of stakeholders in the process. For each group, the following sections identify their role, responsibilities and likely stages of their involvement.

#### **Client Stakeholders Group**

- i. The Client Stakeholders Group (CSG) has overall responsibility for the delivery of the SEA. The CSG will initiate the SEA development process, undertake any SEA tasks required, procure technical inputs required to complete the SEA, and manage the development and adoption processes. Administrative and financial responsibility will remain entirely with this group, although some technical responsibility may be shared with other groups. The client stakeholders involved the following:-President Office – LGRA
- ii. Vice President Office – Division of Environment – VPO –DoE Ministry of Works, Transport and Communication
- iii. Ministry of Finance and Planning
- iv. Dar es Salaam City Council (DCC)
- v. DART
- vi. TANROADS
- vii. Kinondoni, Ilala, Temeke, Kigamboni and Ubungo Municipalities
- viii. JICA

Roles and Responsibilities include:

- i. Deciding on the scope and extent of the SEA.

- ii. Procures and manages the services of the SEA
- iii. Works in partnership with the Consultant to develop:
  - The overall Terms of Reference of the SEA
  - The issues to be dealt with by the SEA
  - The priority of the issues
  - The objectives for the SEA
  - The draft proposals of the SEA. Provides listing of initial consultees to Consultant.
- iv. Directs further consultation, including methods and material to be employed.
- v. Oversees public consultation exercise.

The CSG must be involved throughout the SEA process. Key stages include;

- i. Scoping
- ii. Technical and administrative development
- iii. Consultation
- iv. Finalization
- v. Adoption

### **Key Stakeholders group**

The Key Stakeholder Group (KSG) acts as focal point for discussion and consultation through development of the SEA. The membership of the group should provide representation of the primary interests within the SEA frontage, ensuring consideration of all interests during review of the Dar es Salaam Transport Master Plan. Inclusion of this group offers a more participatory process. This group can be involved through meetings/workshops, although if this is to be pursued then numbers will need to be carefully managed to ensure meetings do not become unmanageable. The incorporation of this group as an additional component provides direct feedback and information to the Consultant, and acts as a focal point for the consultation process.

It is also possible to adopt a more of a partnership approach to the KSG, by developing a collaborative decision-making forum. Under this approach certain responsibilities

normally held by the Client Stakeholders Group may be shared by the KSG in order to increase the level of stakeholder ownership of the final SEA. The key stakeholders comprises of:-

- i. Ministry of Land, Housing and Human Settlements Development
- ii. Ministry of Agriculture, Livestock and Fisheries
- iii. Ministry of Water and Irrigation
- . DAWASA
- i. Ministry of Home Affairs
- ii. Ministry of Industry and Investments
- iii. Ministry of Energy and Minerals
- iv. Ministry of Natural Resources and Tourism
- v. Ministry of Health, Community Development, Gender, Seniors and Children
- vi. Road Fund Board

Roles and responsibilities include:

- i. Comprise representatives of the key stakeholder organizations/interests likely to be affected by the SEA. .
- ii. Suggests issues and their priorities to be considered within the SEA
- iii. Receives reports and draft proposals from the Consultant.
- iv. Meets periodically throughout the production of the SEA.
- v. Provides comment on proposals being made by the Client Stakeholders Group and the Consultant.

Also, where the decision-making powers of the Client Stakeholders Group are to be shared with the Key Stakeholders, the role may include some of the following:

- i. Agrees on the overall scope of the SEA.
- ii. Directs the activities of the Consultant.
- iii. Directs further consultation, including methods and material to be employed.
- iv. Acts as focal point for all stages of consultation.
- v. Agrees with the objectives for the SEA.
- vi. Reviews the policies to be contained within draft SEA.

### **Other stakeholders group**

There will always be large numbers of individuals, public and private organizations who are likely to be affected by the decisions of the SEA. It is unlikely to ever be practical to involve all these stakeholders on one of the three groups outlined above; therefore there will remain a group of 'Other Stakeholders'. This group will be contacted directly by the SEA Consultant but will not be involved in the development of the SEA, other than at the very start and as consultees on the draft report. The list of other stakeholders includes:-

- i. Academics institutions – National Institute of Transport and Ardhi University
- ii. Tanzania Truck Owners Association (TATOA)
- iii. Transporters Association of Tanzania (TAT)
- iv. *Daladala* Owners Association in Dar es Salaam
- v. Tax Association in Dar es Salaam
- vi. *Bodaboda* Association of Tanzania
- vii. Transport users
- viii. Commuters
- ix. Fuel Station Owners
- x. NGO's
- xi. Selected wards from five municipalities

Roles and responsibilities include:

- i. Provide information on their areas of interest/competence.
- ii. Identify issues of concern to them about the implementation of the Dar es Salaam Transport Master Plan.
- iii. Respond to the effect of Dar es Salaam Transport Master Plan proposals on their areas of interest.

### **5.4 Methods for stakeholder's involvement**

Appropriate stakeholders engagement methods were used for various groups of stakeholders during the SEA exercise. The methods involved were as follows:

- ❖ **Meetings-** this included:-
  - i. Individual meetings with key informants and stakeholders’ representatives.
  - ii. Small Group meetings-Focus Group Discussions with different officials at Ministerial and sectoral level.
- ❖ **Large group meetings/workshops** - were used in all five municipalities of Dar es salaam City as shown in Plate 1 and 2



**Plate 5: Stakeholders Consultations in Ilala and Temeke Municipalities**

Source: *Field visit 17<sup>th</sup> July 2017 and 25<sup>th</sup> July 2017*



**Plate 6: Stakeholders Consultations in Kinondoni and Ubungo Municipalities**

Source: *Field visit 24<sup>th</sup> July 2017 and 21<sup>st</sup> July 2017*



**Plate 7: The Guest of Honor Opening the National Workshop**

Source: *National SEA Workshop - 26<sup>th</sup> January 2018*



**Plate 8: SEA Team Presenting Results to Participants**

Source: *National SEA workshop - 26<sup>th</sup> January 2018*





**Plate 9: Stakeholders Commenting on the Presentation**

Source: *National SEA workshop - 26<sup>th</sup> January 2018*

### **5.5 Challenges encountered during the study**

- **The level and availability of information**

SEA is a high level assessment aimed at highlighting potential environmental concerns. The environmental data used in this assessment is based on that which is readily available from existing sources, e.g. government offices and agencies and environmental assessments of transport sector already undertaken by TANROADS and DARTS. No primary research especially on air and water quality has been carried out specifically to inform the SEA and therefore it is possible that at the individual option level, there may be additional environmental issues that could have an influence on the proposed plan options.

Furthermore, at the planning level often there are serious limitations in the availability of information, and a reasonable uncertainty regarding action implementation and respective timings; however didn't impede the satisfaction of plan SEA needs, in terms of required detailed levels of information and certainty.

## **5.6 Issues of concern and interest to stakeholders**

### **5.6.1 Environment and natural resources issues**

- **The plan infrastructure crossing forest reserves, coastal forests and other forested lands**

The proposed master plan will develop some new roads and railway connections particularly with regard to Railway Incentive Plan 1. The corridor connecting Kongowe Pugu, Pugu Luguruni and Luguruni Bunju is likely to traverse existing forest reserves such as Kazi- mzumbwi forest reserve, Pugu forest reserve, Ruvu north forest reserve and Pande forest reserve, which are important remnant water catchment forests. The current forest regulation would require payment for lost forest or forest products due to implementation of the DARTMPor related projects. Therefore implementation of the proposed transport master plan for Dar es Salaam city would have to bear the cost of compensating for these losses.

- **Infrastructure crossing flood prone areas**

The proposed master plan entails developing new roads and railways that will link the CBD, sub centers, satellite cities, and sub satellite cities. Linking some of these components of urban structures will cross some low-lying areas that are prone to flooding, especially during the rainy seasons. As a mitigation measure, for example, crossing Jangwani, Kigogo, Tabata and Mwenge areas would require raising the infrastructure ridge high enough to avoid flooding and inundation, but at a relatively higher construction cost. Associated with this would be the provision for proper drainage also to avoid damming and water impoundment by introducing several culverts and bridges to allow free movement of water across the raised ridges.

- **Soil erosion associated with crossing deep valleys and gorges**

Crossing deep valleys and gorges would require provision of expensive bridges, culverts or proper drainage canals. Thus, crossing areas such as Mkozi and Mzinga in Temeke municipality is likely to trigger degradation and erosion of river banks that are less vegetated. Thus, effective erosion control measures would have to be established during construction in these areas.

- **Pollution emanating from air emissions.**

Another environmental issue of concern to stakeholders was increased levels of air emission particularly in relation to BRT system. The more these buses operate on diesel; significant levels of pollution associated with emission from these vehicles, as well as oil discharges during servicing will contribute to environmental pollution. The best alternative would be to consider expanding railway network to have city commuter trains that will serve more people at any given time..

### **5.6.2 Socio-economic issues**

- **Integration of the DARTMP with local government (municipal and town) plans and master plans**

The proposed DARTMP to a large extent is based on the Dar es Salaam City Land Use Master Plan which is being developed by the Ministry of Land and Human Settlement Development. However, stakeholders are concerned as to what extent the proposed DARTMP has integrated with the local plans and master plans. As a matter of fact the local government plans should be in line with the national land use plan. Similarly, there is concern that implementation of the proposed DARTMP could interfere with a number of local government initiatives at municipal or district levels. Since the corridors for the proposed DARTMP are not known at local level and while local governments continue to plan without integrating the foreseen components of the transport master plan, it is feared that conflicts of interest could arise in future.

- **Compensation and resettlement of people along the corridors**

The implementation of the proposed DARTMP would require compensating people's and public properties and resettle significant numbers of people. According to the preliminary study, the growth of settlements is projected at 4.5% and the master plan owners have not yet acquired the land for the proposed infrastructure development. Since the corridors proposed in the master plan are not known to local government authorities, this is likely to result into great disturbances, costly compensation and resettlement of people and their properties. One participant during the National

stakeholder’s workshop had the following to say in relation to compensation and resettlements;

*“the issue of land acquisition and destruction of properties have been a major concern with many development projects. Many people have lost their houses and properties because development projects. While we acknowledge the importance of infrastructure development in Dar es Salaam, precautionary measures should be taken to avoid unnecessary disturbances and disruption of economic activities to the people by early identification and acquisition of land in areas where satellite cities and transport infrastructure will be developed”.*

- **Significant land take for implementation of the DARTMP**

To fully implement the master plan for any agreed case scenario will require substantial land to accommodate all proposed infrastructure components of the plan. In cases where development will involve constructing roads and railway infrastructure within the same corridor, significant land size will be required. For example, if the planned rail would be of standard gauge, the way leave width required would be 60 m in less populated areas with an adjustment of up to 30 m in highly populated areas. Nonetheless, given the number of links planned to cover both railways and roads there would be significant land take. With the growth and development of the population in the city, such massive land take would create disturbance and land conflicts within the city.

- **Improved transportation within the city**

The major objective of the proposed DARTMP is to provide easy, efficient, reliable, convenient, comfortable, and safe transport within the city and thus facilitate more rapid movement of people, goods and services and foster economic development. It is anticipated that implementation of the proposed master plan will also facilitate improved access to markets for produced goods as well as service provision within the city and the surrounding areas.

- **Employment and job creation**

Development of the transport master plan for Dar es Salaam city with various options and interchange sites would provide employment and create job opportunities to people in different areas during construction, operation and service provision. This would also provide opportunities for knowledge and technology transfers for vertical and horizontal collaboration. People would acquire skills for constructing and managing or operating multiple linked infrastructures within the city.

### **5.6.3 Economic and financial issues**

- **Funding for the planned infrastructure**

One of the major concerns by stakeholders is funding for the proposed or planned infrastructure. The networks of the roads and railway lines are very impressive and provide a number of options and benefits to users within the city. However, the main challenge is the availability of funds to cover for the proposed development. The challenge arises because of the magnitude or scale of resettlement anticipated. For the potential benefits to be realized, the funding would be a major determinant in terms of magnitude and pace at which the plan will be implemented.

- **Boost to economic development and growth of business and industries**

Implementation of the DARTMP would boost the economy of the city and the nation. By opening up new areas and providing efficient transport for goods produced, people and service provision would reach the market on time, and improve business and services.

### **5.6.4 Administrative/institutional issues**

- **Institutional/sector cooperation and coordination**

One of the major development problems in Tanzania is institutional/sector cooperation and coordination in planning and implementing various programmes, and projects. Often times, institutions/sectors of the government at national and local level plan and implement in isolation without sharing information and unifying the plans

for better results. As such, conflicting plans are common and duplication of activities is rife among institutions. To better implement the proposed transport master plan for Dar es Salaam city, great institutional coordination and cooperation would be needed.

- **Synchronization of master plans and programs**

Since there are a number of programmes and plans being developed at municipal level that address issues of urban structure, settlement, provision of services and business, more synchronization of the same needs to be enhanced.

- **Expansion of the scope of the master plan to include other neighboring towns**

The scope of the proposed transport master plan is 30 – 40 km radius from the Dar es Salaam city centre (CBD). Stakeholders are of the view that since the time horizon of the master plan is up to 2040, the transport master plan should expand its scope to include neighboring towns like Bagamoyo, Mkuranga, Kisarawe and Kibaha as one megacity. Currently we have people who live in Mlandizi but work in Dar es Salaam; similarly Mkuranga, Mapinga, Bagamoyo and Kisarawe. Planning for efficient transport to cover those nearby towns would significantly help to decongest the city.

- **Duration of the DARTMP**

The proposed time horizon for the DARTMP is 2040. Stakeholders view this timeframe as relatively too short considering the rate of growth of city. At least we should be planning for 50 years.

- **Preparedness to evaluate and monitor implementation of the master plan**

Stakeholders questioned the preparedness of hosting institutions to implementing the master plan in terms of smooth operation, maintenance, and continuity as well as monitoring and evaluating the performance. The question is whether the government will be able to accomplish the plan with own resources or it would depend on donor support. There is need to develop internal capacity to cover all elements of plan implementation, monitoring and evaluation of performance.

### **5.6.5 Implementation and sustainability issues**

- **Technology**

Implementation of the master plan is to cover a 30 years period. Stakeholders are concerned that since the proposed master plan is based on current technology and standards, there is need for rapid technology transfer and information sharing and engagement of the private sector and donor countries. The issue of reliable electricity for running trains was critical during the discussion in the National stakeholder's workshop. A representative from Chambers of Commerce argued that;

*“ the issue of reliable electricity is very crucial for the sustainability of the proposed DARTMP. Although TANESCO have provided assurance on the availability of reliable electricity, precaution measures should be taken to ensure that power cuts will not happen during the implementation of the plan. We have heard several times from TANESCO authorities that power rationing and frequent power cuts will come to an end and become a history, but it has never happened as we are still facing the same problem”.*

### **5.7 Limited Stakeholder's Engagement**

Involvement of stakeholders is essential to create a sense of ownership of the proposed plan and thus improve the chances of successful plan implementation and ensure its sustainability. Several stakeholders as shown in annex 12.2, annex 12.3 and annex 12.4 expressed concern about limited stakeholder's consultation in the initial stage of the revision of the DARTMP. The lack of a comprehensive consultation process is confirmed by the variations of plans between the proposed DARTMP and what is planned in by the DCC and some of the municipalities. For instance, while the proposed DARTMP is planning to develop a satellite in Kimbiji, the DCC has proposed to develop a satellite in Pemba Mnazi, all in Kigamboni municipality and already the design for Pemba Mnazi is in place. Also, the DARTMP proposes a satellite at Bunju in Kinondoni Municipality; but consultation with Ministry of Land, Housing and Human Settlement Development as well as Bunju Ward Development Committee indicated that

the satellite will be developed in Mabwepande ward. Stakeholders were concerned that this lack of consensus on the location of satellites threatens the sustainability of the proposed DARTMP. In explaining further the limitations in stakeholder's participation and engagement in the preparation of DARTMP, the Kigamboni Municipal Director argued as follows;

*“the proposed Dar es Salaam Transport Master Plan to some extent has not taken into account our recommendation in relation to development plans. Our current plans are to develop satellite cities in Pemba Mnazi, Kisarawe II and Kimangila. When the JICA Study Team visited our office we informed them about our plans and how the proposed DARTMP should be linked to our development plans, unfortunately, this plan still mention Kimbiji as one of the satellite city and our proposed satellite cities do not appear in the proposed DARTMP, it seems the Study Team was too busy to listen and accommodate our plans in the DARTMP”.*

The concern on the limited engagement in the preparation of the proposed DARTMP and other plans was also raised by a participant from TANROADS who argued that;

*“the proposed plan does not relate to the TANROAD priorities. For example, TANROADS has already designed 8 critical intersections and plans for their implementation are already underway, therefore, there is need for JICA Study Team to see how the proposed DARTMP will accommodate the 8 critical intersections as designed by TANROADS”*

She further said;

*“Satellite cities proposed by the DARTMP are not what, the municipal authorities have planned to implement. For example, Kawe satellite city is not even mentioned in the plan”.*



- **Absence of approved Dar es Salaam City Land Use Master Plan**

Stakeholders were concerned that the preparation of the DARTMP is ahead of the Dar es Salaam City Land Use Master Plan, which ideally should constitute the basis of the DARTMP. Stakeholders argued the current Dar es Salaam Land Use Plan has not been approved because it was not participatory and did not involve key stakeholders. The preparation of the DARTMP ahead of the Land use plan will affect optimal utilization of the former, its implementation and sustainability.

## **6.0 TRANSPORT OPTIONS/SCENARIOS – ANALYSIS**

### **6.1 Summary Description of Proposed Plan Alternatives**

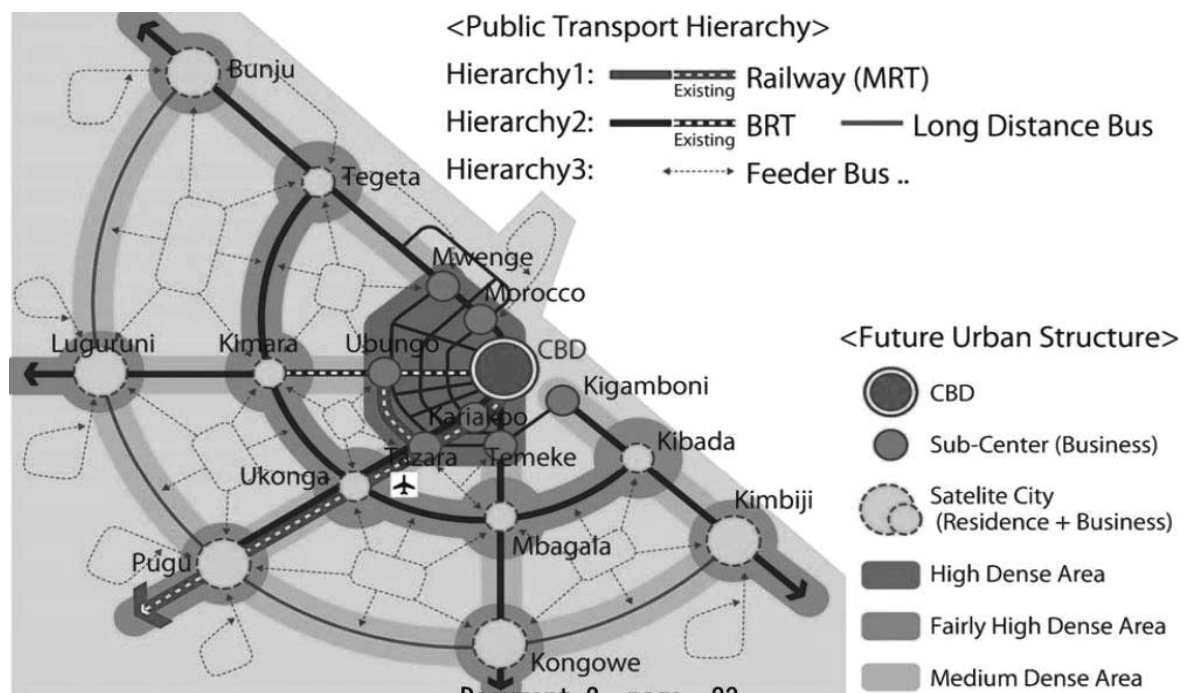
#### **6.1.1 Case 0 Scenario or “No Plan” Alternatives**

The Case 0 alternative for this study entails maintaining the status quo i.e. the existing model of transport whereby most of the businesses and activities are taking place in one CBD, as such all major means of transport converge to the CBD or radiate from the same. Accordingly, the four key roads are; Kilwa road from the south, Morogoro road to the north-west, Pugu road to south west and Bagamoyo road to the north. These key access roads are supported by three ring roads, Bibi Titi road 3km with 4 lanes, Kawawa road 7 km with 4 lanes, and Sum Nujuma –Mandela road 20 km with 4- lanes; and the current BRT (JCC2 2016). In addition to these existing roads the Case 0 also include ongoing projects like road expansion to six lanes Morogoro road and flyover or rather interchanges at Ubungu and TAZARA junctions. Similarly this case includes the ongoing BRT phase 2-3 with a total length of 64km and ongoing Standard Gauge railway project from Dar es Salaam to Morogoro with the length of 202 km

Dar es Salaam being the biggest city in Tanzania, with a big and fast growing population, and having a high level of accumulation and concentration of economic activities in the country, supported by the above spatial structures and transport systems, are subject to potential disruptions, often due to inadequacy and ineffective management. Since the productivity of the city is highly dependent on the efficiency of its transport system and network to move labour, consumers and cargo between multiple origins and destinations, a number of problems are apparent in Dar es Salaam including: traffic congestion and parking difficulties; longer commuting hours; public transport inadequacy; high vehicle maintenance costs, noise and air pollution associated with vehicle movements and accidents and safety are rampant. Therefore, if the proposed urban transport master plan is not undertaken the above-mentioned problems will escalate and the economic activities in the city will continue to be delivered through costly and environmentally, socially and health-wise unfriendly means. This alternative is therefore not recommended but will be used to gauge changes that might happen if any of the other alternatives is selected for development. The “no plan” scenario also provides baseline data and conditions to understand the magnitude and severity of the changes that might occur.

### 6.1.2 Case 1: Alternative- BRT Incentive Case

The BRT incentive case entails the growth of Dar es Salaam city which culminates into one big CBD (i.e. the existing one), with sub-centers for business and satellite cities for both residence and business. The scenario links these urban structures with expanded BRT network from phase 1-6 plus Kigamboni route, middle ring route, extension of Morogoro and Bagamoyo roads to a total length of 286 km (130 +96+60 km) (Table 4). The BRT incentive network is proposed to service the CBD and all sub centers i.e Kigamboni, Temeke, Tazara, Ubungo, Mwenge, Morocco and Kariakoo, with the proposed route from Kariakoo to Mbagala up to Kongowe and another extension from Kariakoo, Tazara, Airport, Ukonga to Pugu. The scenario also include the express busses from Temeke to Kigamboni, Kibada to Kimbiji and another route from Kibada to Mbagala, Airport, Kimara up to Tegeta plus an extension from Kimara , Luguruni to up countries along the Morogoro road. In addition to the road network, the BRT incentive scenario maintains the existing railways TAZARA and TRL. The proposed BRT incentive plan is shown in Figure 3.



**Figure 3: Case 1 Scenario – BRT Incentive Plan**

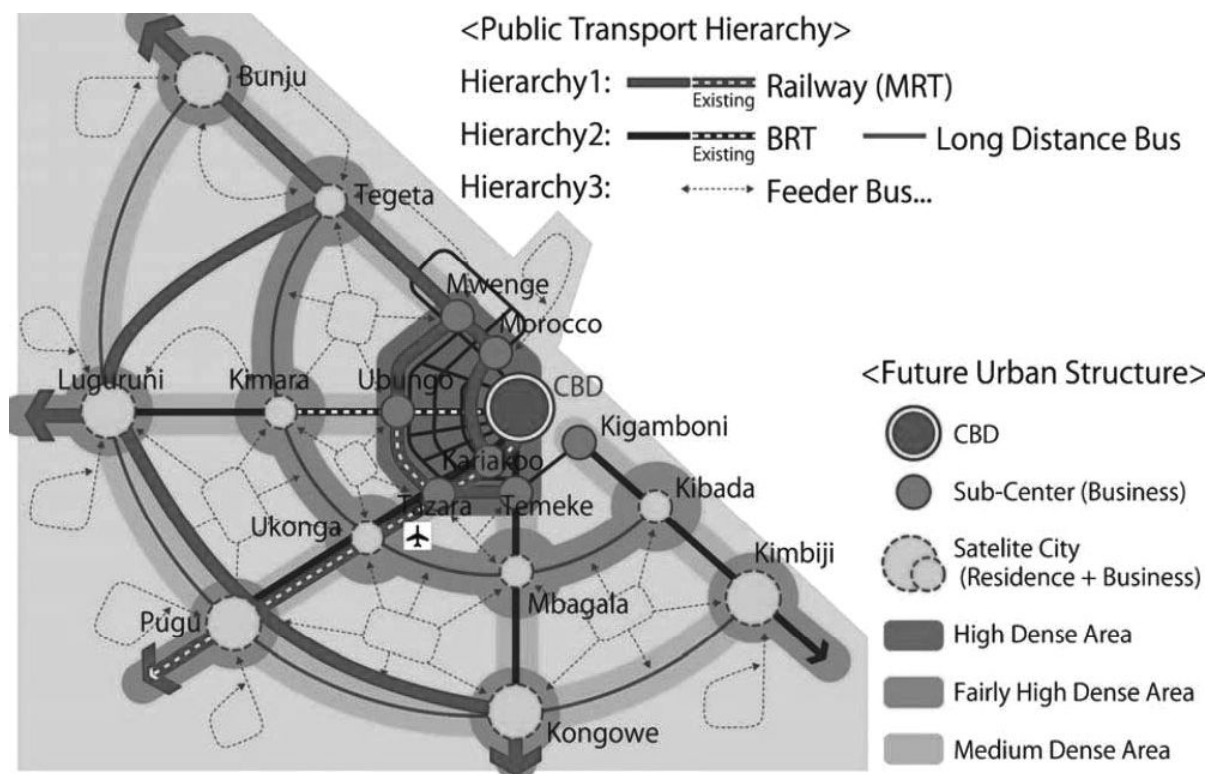
Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

Analyzing this case scenario shows number of advantages in terms of connecting the CBD with sub centers and satellite cities, spreading the pressure of businesses and residence beyond the

CBD as well as capacity expansion. However there is relatively more travel time with the BRT system compared to the rail. With so many transit stations means substantial land take and associated resettlement/compensation costs in relatively densely populated areas. Also, the scenario would contribute to more greenhouse gases emission due to the large number of BRT busses that would have to operate in all the proposed routes. Also, this scenario would require significant number of stop stations to integrate the feeder commuters.

### **6.1.3 Case 2: Railway Incentive Plan 1**

The railway incentive plan 1 scenario still maintains the growth of the city into CBD, sub centres, satellite cities, with the transport model that includes the BRT incentive plan with phases 2-6 as well as the associated environmental impacts. Substantial BRT phase's 2-6 development areas are highly prone to flooding and therefore would need relatively expensive drainage. The Plan also includes minor development of two long distance trip roads; one from Temeke, - Kigamboni and Kibada and the other one from Mwenge to Bunju. The plan focuses on developing more railway routes as per RAHCO plan, to service the out ring connecting Kongowe and Ukonga, Luguruni to Tegeta as one route; and the other route being from Kariakoo to Morocco, Mwenge, Bunju up to Bagamoyo, and extension from Luguruni along Morogoro road corridor adding to a total of 155 km length (Table 4). In addition, this plan is to continue to maintain the existing TRL and TAZARA railway systems. In comparison to others, this scenario has a more extensive circular and radial railway system as per RAHCO plan. The proposed case 2 Railway Incentive Plan 1 is shown in Figure 4.



**Figure 4: Case 2 Scenario - Railway Incentive Plan 1**

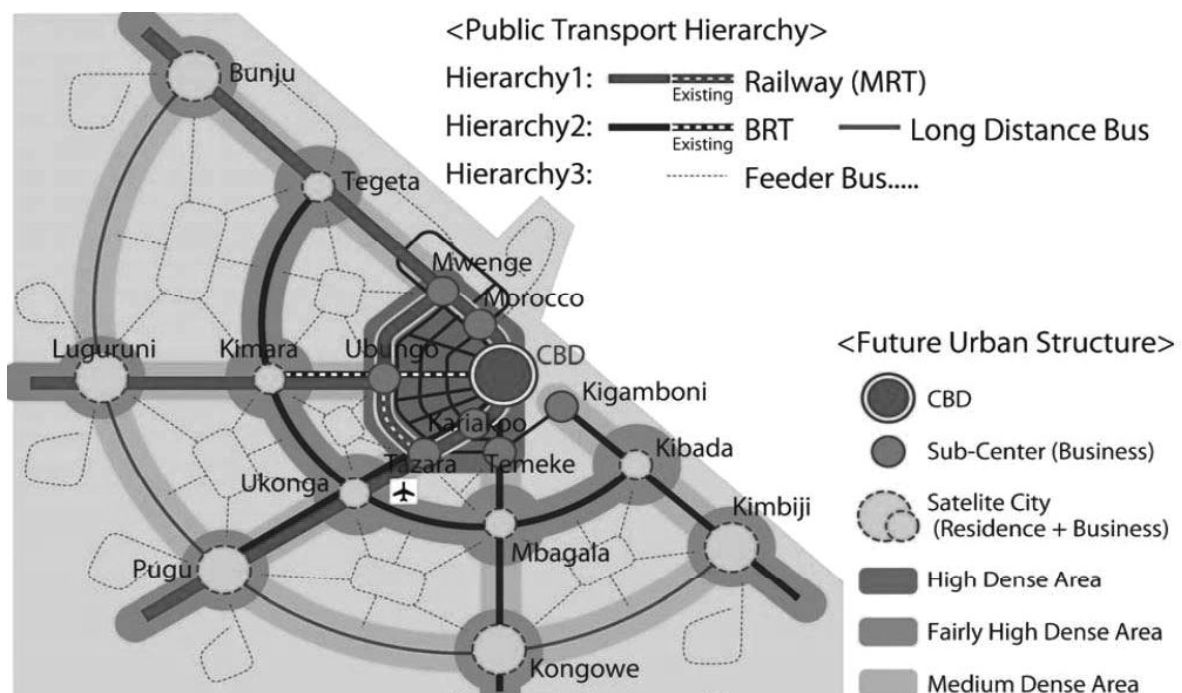
Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

Environmentally, this scenario is likely to reduce greenhouse emissions as the number of BRT busses would be substituted by train commuter and the long distance route also would be served by train. This option is highly supported by stakeholders including Ministry of Works transport and communication, SUMATRA and others with the argument that the city will operate modern train that are environmental friendly. However, this option would involve development of several terminal stations and facilities and leading to backtracking.

#### **6.1.4 Case 3: Railway Incentive Plan 2**

This plan maintains the urban structures of one major CBD, with sub centres for business and satellite cities for residence and business. The model of transport within the planned urban structure constitutes the proposed BRT network covering phase 1-6 plus the Kigamboni route, middle ring route all totaling 226 km (Table 4). This plan entails development of a larger railway network with a circular MRT plus allowance for long-term Bagamoyo MRT and Morogoro MRT, totaling 105 km long. The scenario is projected to meet the mass rapid transport more efficiently as the Circular MRT has a number of MRT stations that are strategically located to provide connections to other transportation systems operating within the

city. Implementation of BRT Phases 2 to 6 would take place in densely populated areas where land take may be a problem. Similarly, traversing some of the regularly water-logging areas may require expensive mitigation measures. In the long-run however, Case 3 railway incentive plan 2 would still be more environmental friendly as the model of transport would be predominantly mass transport which would minimize the number of private transport vehicles per unit time and therefore minimize greenhouse gas emission from vehicle compared to BRT incentive where the number of busses would contribute to increased emission. The option promotes sub-center development for circular rail systems, thus avoiding backtracking and development of terminal stations. This would significantly reduce pressure on the CBD as this pressure is absorbed by the sub-centers. Implementation of all these would contribute to minimization of land take in such highly populated areas while at the same time minimizing congestion and traffic jams i.e. rapid mass transportation with significant comfort. The proposed case 3 Railway Incentive Plan 2 is shown in Figure 5.



**Figure 5: Case 3 Scenario - Railway Incentive Plan 2**

Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

It is notable that the MRT and BRT transport systems would complement each other such that MRT is a long distance transport system, while BRT is a short-range system. This matches the vision of the DARTMP and would minimize congestion, traffic jams, and ensure convenience and comfortability to commuters. However, the Circular MRT Network excludes the southern

part of the city including the densely populated Mbagala and Kigamboni areas, although the BRT system covers these areas adequately. Due to the oil and gas development in southern Tanzania, these arteries out of Dar es Salaam will continue attracting more settlements and industrial development and transport is likely to become a problem, and hence the need for further consideration in the plan. Some stakeholders including RAHCO also raised this concern and thus, while the proposed alternative as described above is also recommended in this work, the need to extend the system to areas such as Mbagala is considered necessary.

**Table 4: Description of Anticipated Projects/Subprojects at each Planning Case scenario/alternative**

No	Case	BRT	Railway
Case 0	Do nothing Case (Existing + on-going)	On-going project (BRT phase - 2 and 3) Length: 64km	On-going project Standard Gauge Rail from (Dar to Morogoro) length :202km
Case 1	BRT Incentive case	BRT Phase 1- 6+Kigamboni route, Middle ring route, Extension of Morogoro and Bagamoyo Length: 130+96+60=286km	
Case 2	Railway Incentive 1	BRT Phase 1- 6+Kigamboni route Length: 130+36=166km	Basically RAHCO FS route Length: 155km
Case 3	Railway Incentive 2	BRT Phase 1- 6 Kigamboni route Middle ring route, Length: 130+96=226 km	The circular MRT+ Bagamoyo MRT+ Morogoro MRT Length: 105 km

Source: JICA 2017. *The Project for Revision of Dar es Salaam Transport Master in URT*

## 6.2 Recommended Environmental Protection Objectives for DARTMP

Whilst the GN-SEA Guidelines (2008) makes provision for Environmental Protection Objectives, their application is promoted as an appropriate tool for identifying and assessing the potential environmental effects, both positive and negative, of the DARTMP. In order that the effects of the Plan is predicted and key issues which need addressing can be identified, a thorough understanding of the context of existing policies and the current baseline characteristics of Dar Es Salaam City is essential. In this study, the Environmental Protection

Objectives were derived from a combination of the following considerations – all of which are based on best information available at the time of analysis including:

- Reviewing the issues of relevance to the Dar es salaam City as described in respective plans, programmes, policies, etc.(e.g. traffic congestion problems);
- Reviewing the environmental characteristics, issues and problems of Dar es Salaam City (e.g. traffic congestion problems); and
- Analysis of baseline data for Dar es Salaam City

Subsequently, the selected SEA objectives in this study are itemized as follows:

**Objective 1:** Safeguard and strengthen landscape quality and countryside against land degradation, erosion and contamination;

**Objective 2:** Conserve and enhance Dar e salaam City biodiversity and geodiversity;

**Objective 3:** Conserve, protect/restore/enhance the historic and cultural sites, heritage assets and their settings;

**Objective 4:** Protect prime sensitive areas, open spaces and green belts;

**Objective 5:** Protect and enhance water quality/quantity, as well as soil and air quality, noise and vibration;

**Objective 6:** Reduce causes of and adapt to the impacts of climate change;

**Objective 7:** Protect seabed features - support processes, habitats & species characteristic of the marine landscapes; and

**Objective 8:** Improve socio-economic welfare and services of the people (e.g. transportation, health, incomes & employment levels).

### **6.3 Comparison of the Transport Master Plan Alternatives**

Based on the selected SEA environmental objectives in section 6.2 above, the four Plan alternatives/scenarios were assessed and evaluated to see how each scenario scores (Table 5). The least score in terms of negative issues was considered the most suitable in terms of environmental protection.

The assessment of the Plan alternatives was done by identifying the likely changes to the baseline conditions as a result of implementing the proposed plan alternative (or reasonable alternative). These changes are described (where possible) in terms of their geographic scale, the timescale over which they could occur, whether the effects would be temporary or permanent, positive or negative, likely or unlikely, frequent or rare. Where numerical



information was not available, the assessment was based on professional judgement and with reference to relevant legislation, regulations and policy including available National and international standards.

In this study, significance is used in the context of the whole of the environment covered by the whole plan area (the City of Dar es Salaam) and to the environment within which projects under the plan will operate individually or cumulatively. In the case of locally significant effects as a result of projects that may not be apparent or considered significant at this strategic level, these will be dealt with at project level ESIA under the plan. The significant changes are determined using significant rating scale defined as:

- +3 Highly significant positive change
- +2 Significant positive change
- +1 Insignificant positive change
- 0 No change
- 1 Insignificant negative change
- 2 Significant negative change
- 3 Highly significant negative change

The results of the assessment of the four plan alternatives are summarised as follows:

#### ***Case 0 alternative/scenario***

This represents the current situation. It is associated with highly significant environmental issues ranging from water pollution, air pollution, erosion, degradation of water bodies, beach and soil contamination resulting from unplanned settlement, poor drainage system and industrial sources causing deterioration of water quality, soil, and air quality. High traffic congestions in all roads in Dar es Salaam due to location of one CBD contribute significant level of emission from traffic.

#### ***Case 1-BRT incentive alternative/scenario***

This alternative proposes that the city be dispersed out with centers and sub centers away from the central business (CBD). These centers and sub centers will be linked to satellites cities will have all the necessary services obtained from the CBD. In fact these satellite cities will perform the CBD functions away from the main CBD which will continue to operate.

**Table 5: Assessment of Proposed Transport Master Plan Alternatives**

Environmental (SEA) Objective	Alternative Development Scenarios			
	Case 0 scenario No plan alternative	Case 1 scenario BRT incentive case	Case 2 scenario Railway incentive plan 1	Case 3 scenario Railway incentive plan 2
<b>Objective 1:</b> Safeguard and strengthen landscapes quality and countryside against land degradation, erosion and contamination	-3	-2	-2	-1
<b>Objective 2:</b> Conserve and enhance Dar es Salaam Region biodiversity and geodiversity	-3	-2	+1	+2
<b>Objective 3:</b> Conserve, protect/restore/enhance the historic environments, heritage assets and their settings	-3	-2	-2	-1
<b>Objective 4:</b> Protect prime sensitive areas, open spaces and green belts;	-3	-2	-1	-1
<b>Objective 5:</b> Protect and enhance water quality and quantity, and soil and air quality, noise, vibration	-3	-2	-2	-1
<b>Objective 6:</b> Reduce causes of and adapt to the impacts of climate change	-2	-2	-2	+2
<b>Objective 7:</b> Protect seabed features - support processes, habitats & species characteristic of the marine landscapes	-1	-1	-2	-2
<b>Objective 8:</b> Improve socio-economic welfare of the people (e.g. health, income & employment levels)	-2	+1	+2	+3
<b>Ranking of the alternatives</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

This model reduces significant the need to all people visiting the main CBD thus reducing traffic congestion. However, the number of BRT busses themselves will have significant contribution to air pollution due to emission. Similarly, lack of other services like parking lots for private cars, and limited railway services will still attract private owner to use their vehicles thus contributing to air pollution.

### ***Case 2- Railway incentive plan 1 alternative/scenario***

This scenario is intended to solve the limitations observed in BRT incentive plan. Railway incentive plan 1 will integrate railway system with BRT. However there is relatively more travel time with the BRT system compared to the rail. With so many transit stations means substantial land take and associated resettlement/compensation costs in relatively densely populated areas. Also, the scenario would contribute to more greenhouse gases emission due to the large number of BRT busses that would have to operate in all the proposed routes. Similarly, this scenario would require significant number of stop stations to integrate the feeder commuters.

### ***Case 3-Railway incentive plan 2 alternative/scenario***

This scenario is capitalizing on mass transport system while maintaining the urban structure that spread the pressure away from the central CBD into sub centers and satellite cities. The modification is on the model of transport where significant number of railways is increased with circular system to support BRT and express busses as well. The access to the CBD is improved by a middle ring providing various options to access the CBD as there will be integration of roads and railways and all big nodes being serviced by MRT. This scenario minimizes the number of transit station as the railway operates nonstop in circular manner with no need of terminal. The railway incentive plan 2 has minimized all the limitations of railway incentive plan 1. Assessment of this alternative against environmental objectives performed better compared to other alternative and was ranked number 1 in terms of preference. Therefore this alternative is the most preferred option.

## **6.4 Recommended/Preferred Transport Master Plan Alternative**

From the analysis using environmental objectives, expert judgment, stakeholder views and performance criteria (developed by the JICA planning team), case 3- Railway incentive plan 2 alternative/scenario is the recommended alternative. The urban structure proposed under this alternative together with various infrastructures proposed to service the urban structure and set up are analysed in details in order to develop mitigation

measures to improve the implementation of the plan for environmental sustainability and sustainability of the plan itself.

## **6.5 Comprehensive Environmental Assessment of the Preferred/Recommended DARTMP**

The recommended DARTMP utilise urban structure case 2 which requires that the Dar es Salaam city is dispersed with urban structures consisting of CBD, Sub-centers, and Satellite cities forming the key nodes for urban structure; each key node performing different functions i.e. CBD: commercial and business function: Sub-centers: commercial and business function and Satellite cities: commercial and business functions as well as residential functions. Satellite cities will be connected with each other by a ring road that will be serviced by express busses. The proposed Satellite cities are in Bunju, Luguruni, Pugu, Kongowe, and Kibada, as outer satellite cities; Tegeta and Kimara as inner satellite cities. This model of urban structure offers a number of merits such as reduced congestion in CBD through development of Sub-centers and Satellite Cities; more time saving; most redundant and resilient; most competitive in terms of logistic flow; revitalization of CBD. The only demerit to this urban structure is that it involves high cost and consumes time to build satellite.

Therefore based on the above setting more detailed environmental impact assessment is undertaken as shown in the following sub-sections.

### **6.5.1 Positive impacts**

- *Enhanced socio-economic and welfare of the people*

The development of the proposed DARTMP has highly significant positive potentials. The implementation of the plan to develop urban structure that promotes development of nodes such as sub centers and satellite cities will stimulate economic development of sub centers and satellite cities. Associated with growth of sub centers and satellite cities is growth of business and service sector which will boost the economy. Similarly the improved transport system will ease transfer of goods and services to market place and

reduces delay and time wasted on traffic jam. Improvements in transport infrastructure will help in terms of access to market, movement of goods and commodities as well as increased trade among the people within city and the country at large.

*Enhancement measures*

- i. The Government shall ensure that the proposed master plan and all proposed projects under the plan are fully developed to realize its full benefit
- ii. The government will enhance institution and sector coordination among various actors under the proposed plan
- iii. Planned industries and other drivers of the economy will be developed to benefit from improved transport system

- ***Employment and job creation***

Development of the proposed master plan would provide employment and create job opportunities to people from the city and nearby town centers like Bagamoyo, Kibaha, Mkuranga and Kisarawe. This would create chances for knowledge and technology transfers for vertical collaboration and horizontal collaboration. Our people would acquire skills for constructing and managing or operating multiple transport system, traffic management and others.

*Enhancement measures*

- i. Government will promote training of human resources to take leading role in job creation and available opportunities
- ii. Technical training to Tanzania job seeker will be provided to maximize job opportunities emerging

- ***Improved transportation***

Development of the proposed DARTMP would improve transportation of goods produced locally and in those areas with industrial potential within and outside the city. Also improved access to the market for produced goods due to improved transport would

contribute significantly to economic growth. Similarly, improvement of transport infrastructure and reduces congestion will improved efficiency of Dar es Salaam port as cargo will be moved quickly to destination and contribute positively to the National economy.

*Enhancement measures*

- v. TANESCO will set a dedicated power line to supply power to the MRT
- vi. The transport master plan developed will be integrated to provide more linkages and connectivity with other social services such as up country bus stops and airport

- ***Efficient traffic movement***

Construction of roads, railway lines, feeder roads and improvement and widening of roads will ease traffic in most parts of Dar es Salaam City. Critical area of concern like the CBD, Mbagala, Mbezi – Kimara, Tegeta etc are often congested with high density of activities which are also prone to poor air quality. Improvement of transport system will reduce congestion and enhances efficient traffic movement eventually improving local air quality.

*Enhancement measures*

- i. The Dar es Salaam City Council, Traffic Police and SUMATRA will ensure the transport system to be established shall be efficient by addressing bottlenecks that might slow its performance

### **6.5.2 Negative impacts of the alternative**

- ***Land take and displacement***

The planned infrastructure development like railway, roads and feeder roads and expansion of some of existing road, construction of new roads and railway lines and modal interchange will require land take. The process of land acquisition may lead to

inevitable displacement of houses and commercial buildings causing inconvenience and disruptions to the affected families and businessmen.

*Mitigation measures*

- i. Areas earmarked for infrastructure development will be identified and land acquired as soon as possible to avoid high cost in the future and disturbance to people.
- ii. Affected persons will be compensated as per the national and international best practices
- iii. Comprehensive Environmental and Social Impact Assessments (ESIA) will be carried out for all planned projects prior to commencement of the implementation activities

• ***Disruptions of public infrastructure***

In Dar es Salaam City Council much of public infrastructure such as water pipes, electricity and telecommunication cables are installed along the major road services. Expansion and construction of new roads and railways will certainly disrupt these infrastructure services and cause inconvenience to service providers and the general public.

*Mitigation measures*

- ii. The government will ensure proper institution coordination among all stakeholders such DAWASA, TANESCO, SUMATRA, TANROADS, TPDC, SONGAS (for gas pipelines) telecommunication companies and municipalities to minimize disruption of services at the implementation stage
- iii. The government will liaise with the implementing agency regularly to get information on the existing and future uses of services

• ***Contribution to landscape changes***

Development of roads for BRT phase 1-6 of the plan, railway to cover the plan and feeder roads will contribute to significant change in landscape. The proposed sub centers and satellite cities are located on outskirts of Dar es Salaam which are characterized by

hilly and undulating terrain as compared to the current CBD area. Thus, development of infrastructure to connect these urban structures will cause landscape changes especially on hilly areas requiring cut and fill and establishment of bridges to cross valleys, rivers and streams.

*Mitigation measures*

- i. Proposed design of the infrastructure shall comply with respective standards that protect landscape and seascapes.
- ii. All proposed project under the plan shall be subjected to ESIA study prior to its commencement

• ***Impact on biodiversity***

The main threats to biodiversity are likely to be an expansion of transport network for roads, railway, and supporting infrastructures as proposed in the DARTMP. The construction of the missing link across new Salender Bridge will impact marine biodiversity while development of out-ring road will accelerate degradation of nearby forested areas. Similarly dispersion of the city with development of proposed urban structure with associated infrastructures will contribute to biodiversity loss as majority of the city dwellers are still using charcoal as a source of energy. growth of urban centers with improved transport infrastructures will ease transportation o charcoal and fuel wood from a nearby protected area and contribute to biodiversity loss.

*Mitigation measures*

- i. The Government will establish and adhere to land use plan to guide development of the sub centers and satellite cities
- ii. Comprehensive ESIA will be carried out for all planned project prior to commencement of the implementation activities
- iii. The Government will enhance institutional coordination and cooperation in executing the master plan in holistic manner



- ***Impact on water resource and its sustainable use***

The implementation of the proposed DARTMP will contribute to increased consumption of water and impact the quality and quantity of water sources. Expansion of the urban under the proposed urban structure and its function, development of transport infrastructures like Rail primary roads, secondary roads and tertiary roads under the plan will require significant amount of water to meet the requirement. In addition to the demand to meet the master plan requirement still there will be need of water for domestic and industrial need that cumulatively will have impact on water resources and its sustainability.

*Mitigation measures*

- i. The Government will establish city water budget to guide utilization of available water sources and resources for present and future use
- ii. Measures to conserve and protect water sources shall be backed up with comprehensive studies on water and water resources management

- ***Increased energy demand and use***

The implementation of the DARTMP will increase the demand for fuel energy. Regardless of the time of energy the number of transport infrastructure express busses, trains and BRT busses all need energy to operate. The initial thinking is that the propose infrastructures will operate using diesel, the amount of energy required will be high given that the same diesel is required to run other means of transport such as private car and machines. The cumulative demand is significant higher, considering the fact that Tanzania fuels depends 100% on imported fuels. Any increase in demand will significantly trigger fuels shortage unless strategies for improve country fuel reserve is implemented

*Mitigation measures*

- i. The government will make sure that transport infrastructures proposed will be designed to utilize modern technology that is environmentally friendly and uses less energy

- ii. Promotion of the use of Gas on BRT busses and electric trains to minimize pressure on diesel requirement will be emphasized

- ***Increased air pollution and contribution to climate change***

The model of transport proposed under the DARTMP is combination of BRT with MRT, Operation of locomotives, BRT and private cars particularly trucks ferrying cargo from the port using diesel fuel will contribute to air pollution due to GHG emissions resulting from the use of diesel fuel. Given the number of infrastructures proposed that adds to existing and project private vehicles by 2040 the levels of GHG generated will be significant. Connected to levels of GHG generated is the reduced vegetation cover due to establishment of infrastructures and growth of city under the preferred urban structure GHG generated will be significantly higher.

*Mitigation measures*

- i. The government will make sure that transport infrastructures proposed will be designed to utilize modern technology that is environmentally friendly and uses less energy
- ii. Promotion of the use of Gas on BRT busses and electric trains to minimize pressure on diesel requirement will be emphasized
- iii. Proposed design shall comply with relevant standards and be implemented by respective authorities

- ***Social delinquency, HIV/AIDS and sexually transmitted diseases***

The creation of job opportunities in the satellite cities and sub centers both at construction and operation phases is bound to increase the number of people due to in-migration of job seekers. Due to influx of people, the social interaction between the community and the migrants will certainly occur. Different areas which have been proposed for the development of satellite cities have varying level of income, with most of them in Kongowe, Luguruni, Mabwepande, Kimbiji, etc are of low income with higher unemployment rates. Since most of the workforce during construction are young and are

in active age of reproduction, there is bound social relation that predisposes both parties to contraction of sexually transmitted diseases including HIV/AIDS.

*Mitigation measures*

- i. Dar es Salaam Municipalities will provide education and undertake sensitization workshops of workers and communities around satellite cities on HIV/AIDS.
- ii. Dar es Salaam Municipalities will work closely with various HIV/AIDS organizations working in plan zone of influence in order to reduce the spread of HIV/AIDS and other communicable diseases

• ***Impact on sites and buildings of archaeological, historic, & cultural value***

The implementation of the development of roads, railways, and associated infrastructures for the city of Dar es Salaam will potentially affect sites and building with archaeological, historic, and cultural values. The number of projects to be implemented in Dar es Salaam and location where most of these roads will be developed will still have negative impact on places, landscape, and building of archaeological, historic, and cultural significant. In Dar es Salaam city there are site and building of archaeological importance that are gazetted and ungazetted as per antiquity Act 1969 and conflict with the objective 1; that advocate protection of these places.

*Mitigation measures*

- i. All project implementers under the DARTMP plan will liaison with The Department of Antiquities to integrate the heritage resource of the city (gazetted and ungazetted) to protect them from damage
- ii. All heritage resources and sites of historical and cultural value will be mapped out and measure to protect them developed and implemented.

## **7.0 ENVIRONMENTAL MITIGATION/ENHANCEMENT PLAN**

### **7.1 Introduction**

The mitigation options presented in this chapter are informed by the principles of Carrying Capacity (CC) and Limits of Acceptable Use/Change (LAU). The main assumption of CC framework is that under a given set of environmental conditions, any given area is able to support only a finite number of animals or humans (e.g. a village, district or region). This limit can be pushed outward through technology choices. However, it can be exceeded for a while but is soon prevented from further increase in numbers by increased mortality (due to limited resources, competition etc). The core assumption of Limits of Acceptable Use/Change framework (LAU) is that any development such as the proposed the transport master plan for Dar es Salaam city risks some degree of negative impact on the natural and social system. The tolerable limits of change are a matter of deliberate decision-making with implicit recognition of risks and trade-offs. Thus development of mitigation measures intends to minimize the Risks and changing or impeding natural and social systems. Thus implementation of various option of the plan will bring inevitable change with varying degree of assimilation to natural and social systems.

The environmental characteristics of areas where various projects under the plan will be implemented create thresholds for many impact parameters predicted under the recommended plan. The number and types of projects development activities under the DARTMP that the environment can support at any given time, surely will create negative impacts unless technological aspects implemented as mitigation measure can allow for the development of the proposed master plan. Thresholds of this kind can potentially be extended through the selection of technology, such as use of clean energy sources for BRT, express busses and locomotives serving as commuter trains. The development of physical infrastructure will necessarily entail some modifications in design to comply with applicable standards, the technology that minimize construction materials and waste generated or combining railway way leave with BRT and other vehicle to minimize magnitude of resettlement and development of only key priority projects under the plan that provide value for money and substitute trucks ferrying cargo from the port with goods locomotives at least to modern dry ports established outside Dar es Salaam.

Thus, the mitigation measures recommended in this SEA are based on the premise that decision-makers must be aware of risks and trade-offs to the extent possible as a basis of informed decision-making. Careful monitoring of social and environmental parameters and indicators available will be necessary while considering precautionary approach in decision making about the implementation of the plan.

## **7.2 Mitigation/enhancement measures**

This section present the recommended mitigation measures for various impacts predicted for the recommended alternative for DARTMP. The mitigation measures are developed for impacts that are considered significant and the analysis has pooled together the impact of various projects to be implemented by the recommended alternative of the transport master plan for Dar es Salaam City. The mitigation measures are presented in Table 6 below.

**Table 6: Plan for Enhancement Measures of Significant Positive Impacts**

	<b>Significant Impact</b>	<b>Enhancement Measures</b>
<b>Positive impacts</b>		
1	<i>Enhanced socio-economic and welfare of the people</i>	<ul style="list-style-type: none"> <li>• The Government shall ensure that the proposed master plan and all proposed projects under the plan are fully developed to realize its full benefit</li> <li>• The government will enhance institution and sector coordination among various actors under the proposed plan</li> <li>• Planned industries and other drivers of the economy will be developed to benefit from improved transport system</li> </ul>
2	<i>Employment and job creation</i>	<ul style="list-style-type: none"> <li>• Government will promote training of human resources to take leading role in job creation and available opportunities</li> <li>• Technical training to Tanzania job seeker will be provided to maximize job opportunities emerging</li> </ul>
3	<i>Improved transportation</i>	<ul style="list-style-type: none"> <li>• TANESCO will set a dedicated powerline to supply power to the MRT</li> <li>• The transport master plan developed will be integrated to provide more linkages and connectivity with other social services such as up country bus stops and airport</li> </ul>
4	<i>Efficient traffic movement</i>	<ul style="list-style-type: none"> <li>• The Dar es Salaam City Council, Traffic Police and SUMATRA will ensure the transport system to be established shall be efficient by addressing bottlenecks that might slow its performance</li> </ul>
5	<i>Enhanced air quality</i>	<ul style="list-style-type: none"> <li>• Promotion of the use of Gas on BRT busses and electric trains to minimize pressure on diesel requirement will be emphasized</li> </ul>

**Table 7: Plan for Mitigation Measures of Significant Negative Impacts**

Negative impacts		Mitigation measures
1	<i>Land take and Displacement</i>	<ul style="list-style-type: none"> <li>• Areas earmarked for infrastructure development will be identified and land acquired as soon as possible to avoid high cost in the future and disturbance to people.</li> <li>• Affected persons will be compensated as per the national and international best practices</li> <li>• Comprehensive Environmental and Social Impact Assessments (ESIA) will be carried out for all planned projects prior to commencement of the implementation activities</li> </ul>
2	<i>Disruptions of Public infrastructure</i>	<ul style="list-style-type: none"> <li>• The government will ensure proper institution coordination among all stakeholders such DAWASA, TANESCO, SUMATRA, TANROADS, TPDC, SONGAS (for gas pipelines) telecommunication companies and municipalities to minimize disruption of services at the implementation stage</li> <li>• The government will liaise with the implementing agency regularly to get information on the existing and future uses of services</li> </ul>
3	<i>Contribution to landscape change</i>	<ul style="list-style-type: none"> <li>• Proposed design of the infrastructure shall comply with respective standards that protect landscape and seascapes.</li> <li>• All proposed project under the plan shall be subjected to ESIA study prior to its commencement</li> </ul>
4	<i>Biodiversity change</i>	<ul style="list-style-type: none"> <li>• The Government will establish and adhere to land use plan to guide development of the sub centers and satellite cities</li> <li>• Comprehensive ESIA will be carried out for all planned project prior to commencement of the implementation activities</li> <li>• The Government will enhance institutional coordination and cooperation in executing the master plan in holistic manner</li> </ul>
5	<i>Impact on water resource and its sustainable use</i>	<ul style="list-style-type: none"> <li>• The Government will establish city water budget to guide utilization of available water sources and resources for present and future use</li> <li>• Measures to conserve and protect water sources shall be backed up with comprehensive studies on water and water resources management</li> </ul>
6	<i>Increased energy demand and use</i>	<ul style="list-style-type: none"> <li>• The government will make sure that transport infrastructures proposed will be designed to utilize modern technology that is environmentally friendly and uses less energy</li> <li>• Promotion of the use of Gas on BRT busses and electric trains to minimize pressure on diesel requirement will be emphasized</li> </ul>

7	<i>Increased air pollution and climate change</i>	<ul style="list-style-type: none"> <li>• The government will make sure that transport infrastructures proposed will be designed to utilize modern technology that is environmentally friendly and uses less energy</li> <li>• Promotion of the use of Gas on BRT busses and electric trains to minimize pressure on diesel requirement will be emphasized</li> <li>• Proposed design shall comply with relevant standards and be implemented by respective authorities</li> </ul>
8	<i>Social delinquency, HIV/AIDS and Sexually Transmitted Diseases</i>	<ul style="list-style-type: none"> <li>• Dar es Salaam Municipalities will provide education and undertake sensitization workshops of workers and communities around satellite cities on HIV/AIDS.</li> <li>• Dar es Salaam Municipalities will work closely with various HIV/AIDS organizations working in plan zone of influence in order to reduce the spread of HIV/AIDS and other communicable diseases</li> </ul>
9	<i>Impact on sites and buildings of archaeological, historic, &amp; cultural value</i>	<ul style="list-style-type: none"> <li>• All project implementers under the DARTMP plan will liaison with The Department of Antiquities to integrate the heritage resource of the city (gazetted and ungazetted) to protect them from damage</li> <li>• All heritage resources and sites of historical and cultural value will be mapped out and measure to protect them developed and implemented.</li> </ul>



## **8.0 MONITORING AND EVALUATION**

### **8.1 Introduction**

The element of monitoring and evaluation based on coordinated institutions and various actor of the DARTMP and collection of regular data for monitoring and evaluation is mandatory for efficient management of the proposed master plan. The nature of the environment where various projects of the plan will be implemented, differences in environmental standards and requirements, differences in permits, or regulation guiding the operation or development of particular sectoral requirement. Monitoring and Evaluation must be built in the TSMP and taken as integral part of the implementation of the master plan proposed in order to collect data that will be used to inform future revisions and changes for sustainability of the plan and the recipient environment. Resources must be allocated for this task otherwise future revisions will have no basis for any proposed changes.

### **8.2 The Planning Framework for monitoring**

The combination of Carrying Capacity/Limits of Acceptable Change, integrated resource management plan, and sustainable livelihood frameworks offers a powerful tool for assessing and managing risks associated with accelerated, broad-based economic change, such as that anticipated by the implementation of DARTMP. The CC/LAU perspective draws attention to the ability of the natural environment to sustain pressure from the proposed plan and associated development anticipated following the implementation of the master plan. The sustainable livelihoods approach provides a framework for understanding impacts on the social and economic factors underpinning the well-being of local populations. The Integrated Resource Management Plan (IRMP) provides a comprehensive framework guide to define and manage the carrying capacity. The IRMP guides how to allocate resources, monitor jointly their sustainable use, facilitate interaction and linkages within ecosystems, determine the numbers of issues to handle at a time while maintaining environmental quality and divide responsibilities among the actors when it comes to managing sustainably the carrying capacity.

To avoid negative impacts, it is imperative to develop measures that will indicate when and where environmental and social problems are apparent and unacceptable/intolerable, needing management intervention i.e. indicators. For example, significant change in vegetation cover,

land/soil degradation may indicate that the environmental threshold has been exceeded. In general, selection of indicators is usually done based on the following criteria:

The indicator must provide timely information (to allow for response);

The indicator must be sensitive to be able to detect small changes in the system;

The indicator must be based on good quality data that are available at a reasonable cost (i.e. cost- effective or affordable);

The indicator must be based on data of the correct spatial and temporal extent;

The data must be attainable and its collection process should have minimal environmental and social impact.

The concept of LAU may be practical approach for DARTMP because of the limitations of the CC analysis and data availability problems. In the LAU, standards are set for the minimum acceptable conditions. This involves defining the limit of ecological or sociological use or change (which may involve some degradation) that will be allowed at a site.

At this strategic level the monitoring indicators for DARTMP will include indicators that

- Monitor the implementation of the plan itself, i.e. are all proposed project under the plan being implemented respective actors?
- Indicator that monitor or check the effectiveness of implemented mitigation measures provided to minimize predicted impacts
- Indicator that monitor or inform about the performance of the implemented transport master plan in terms of efficiency, convenience, mobility, comfortability, accessibility, affordability and safety
- Development of institution framework to monitor the plan and
- Capacity building at local government authority level to carry out monitoring and evaluation of the plan performance

## **8.2 Management action plan**

Development of management action plan is guided by the sensitivity of the areas that need protection. Sensitivity here can include protected areas like forest reserves, game reserves, ecologically fragile areas like wetlands, marine environment, and flood or erosion prone areas. The interpretation of these areas as sensitive is supported by the state of environment Report

(2009) which provides details about management objectives, with associated indicators and standards/thresholds; thus management action plan to safe guide these sensitive areas must be developed. The master plan should focus on defining the technology that will be used and linkage between improved transportation and the city and national economy development. The plan should also define the degree of (land) resource degradation, threats and protection measures, monitoring conditions over time, and adoption of sustainable management practices that will ensure acceptable conditions (e.g. through LAU or LAC).

### **8.3 Sustainable livelihoods**

The Sustainable Livelihood framework helps to assess whether or not the socio-economic developments are achieving desired objectives. It also helps in identifying risks associated with particular livelihoods capital assets to depict the nature, extent, and severity of risks for designing appropriate mitigation measures or supporting locally adaptable coping strategies for healthy survival of humans. Depending on the mitigation measures put in place and effectiveness in ensuring implementation, long-term livelihood strategies could be improved and diversified.

**Table 8: Recommended Indicators for Monitoring**

Sustainability issues	SEA Objective	SEA indicator
Landscape change Ecosystem, Fauna, Flora	Prevent damage to terrestrial and aquatic and soil biodiversity, particularly designated habitats sites and species.	<ul style="list-style-type: none"> <li>- Status of protected areas/reserved areas</li> <li>- Loss or deterioration of priority habitats/species</li> </ul>
Air quality	Minimize aerial emission due to the vehicular /locomotive pollution due to DARTMP implementation	<ul style="list-style-type: none"> <li>- Estimated emission levels from vehicular and locomotives (within existing lines) for gases and particulate matter (e.g. Carbon Dioxide)</li> <li>- GHG emission from vehicular /locomotive pollution</li> </ul>
Climatic factor (emission)	Minimize contribution to climate change due to emission of greenhouse gases with appropriate energy source mix	<ul style="list-style-type: none"> <li>- Levels of water pollution in major rivers</li> </ul>
Water use	Avoid water use conflicts between various water uses Maintain and improve quality of water resources (rivers) from pollution Maintain and improve the quality of environmental services	<ul style="list-style-type: none"> <li>- Programmes to improve livelihoods of affected persons as a result of the implementation of the DARTMP.</li> <li>- Population numbers along the five corridors</li> <li>- Number of reported cases associated with grievances arising from resettlement</li> </ul>
Population	Minimize disruption and displacement to the local population Maintain and improve local environmental and health quality including reduction of diseases associated with transportation	<ul style="list-style-type: none"> <li>- Status of water catchment areas and environmental flows</li> <li>- Rate of deforestation on nearby forest reserves and green belt after implementation of the projects under DARTMP</li> </ul>
Natural resource uses	Minimize use of non-renewable resources	<ul style="list-style-type: none"> <li>- Amount of recycling and reuse of waste</li> <li>- presence of established and working comprehensive waste management plan and action plan</li> </ul>
Solid and liquid waste generation	Environmentally-sound use and management of hazardous/polluting materials and wastes	

#### **8.4 Institutional Framework and Capacity Development for Implementation of this SEA**

The Environmental Management Act Cap 191 and subsequently the Strategic Environmental Assessment Regulation of 2008 designates the Division of Environment in the Vice President's Office as the institution responsible for SEA processes. It also directs sector ministries to initiate and supervise the preparation of the SEA. The implementation of the programs, policy, legislation, or plan for which the SEA is necessary falls under the sector responsible for those activities, in collaboration with others sectors.

Thus, the principal institution relevant for the implementation of this SEA and its recommendations is the President Office Regional and Local Government. The ministry is particularly responsible for policy issues, legal processes, and overall implementation of the policies /plan in this SEA. As directed by the Environmental Management Act (Cap. 191), the Sector Environmental Coordination Unit within the SEA initiating ministry/ sector shall be responsible for monitoring and evaluation.

In terms of the implementation of the recommendations from this SEA, PO-RALG staff will be responsible at the local - implementation level, together with the Environmental Unit of Dar es Salaam City Council. These two institutions do not have strong capacity in environment and SEA related issues, therefore there must be capacity building need for the institutions to carry out monitoring of the DARTMP as per EMA Cap 191. In this case a more systematic and specific capacity development programmes must be planned and undertaken.

The capacity development needs for PO-RALG in particular DCC staff should be informed by a needs assessment that will be undertaken immediately so that gaps in terms of skills, knowledge and institutional arrangement are addressed in time.

## **9.0 ANALYSIS OF UNCERTAINTIES**

### **9.1 Urban Structure Plan**

The Master Plan has proposed development of Outer Satellite Cities in Bunju in Kinondoni District, Luguruni in Ubungo District, Pugu in Ilala District, Kongowe in Temeke District and Kibada in Kigamboni District. Also it proposed Inner Satellite Cities Tegeta in Kinondoni District and Kimara in Ubungo District. These Satellite Cities are to be implemented by the government through Kinondoni Municipal Council, Ubungo Municipal Council, Ilala Municipal Council, Temeke Municipal Council and Kigamboni Municipal Council. However, there is no commitment from the Municipal Councils to prepare detailed drawings for implementation in development of the Satellite Cities. Instead, the Municipal Councils have prepared detailed drawings for implementation of Satellite Towns in other places. For instance, Kinondoni Municipal Council has prepared detailed drawings for implementation of a Satellite Town in Mabwepande and the Temeke Municipal Council in collaboration with the Dar es Salaam City Council has prepared detailed drawings for implementation of a Satellite Town in Pemba Mnazi. Consequently, if no appropriate measures are taken through stakeholders' engagement and commitment of the Municipal Councils the proposed idea of Satellite Cities may remain in shelves.

Also the Master Plan has proposed the Sub Centers in Mwenge and Morocco in Kinondoni District, Ubungo in Ubungo District and TAZARA in Ilala District. However, there is no commitment from the Kinondoni Municipal Council, Ubungo Municipal Council and Ilala Municipal Council to prepare detailed drawings for implementation in development of the Sub Centers. Thus, if no measures are taken through stakeholders' engagement and commitment of the Municipal Councils, the proposed idea may also remain in shelves.

Furthermore, the Master Plan has proposed the District Centers in Tegeta in Kinondoni District, Mbezi in Ubungo District, Ukonga and Mbagala in Ilala District, Temeke in Temeke District and Kigamboni in Kigamboni District. Similarly, there is no commitment from the relevant Municipal Councils, to prepare detailed drawings for

implementation of the same. This calls for stakeholders' engagement and commitment on the part of the Municipal Councils to take these developments further to completion.

## **9.2 Public Transport Plan**

The Master Plan has proposed Public Transport Network Plan for improvement of public transport through Mass Rapid Transit (MRT) and Bus Rapid Transit (BRT). These proposed projects are to be implemented by the government through RAHCO (MRT Projects), DART (BRT Projects), and TANROADS (improvement of BRT Primary and Secondary Routes). Here too, there is no commitment from RAHCO to implement the proposed MRT Projects, DART to implement the proposed BRT Projects, and TANROADS to improve the BRT Primary and Secondary Routes. It is equally apparent that if RAHCO, DART and TANROADS are not adequately engaged during these early stages of planning, RAHCO, TANROADS, and DART are likely to continue with business as usual and leave out these beautiful ideas unimplemented.

Furthermore, the Master Plan has proposed Intercity Bus Terminals, Tertiary Terminals, Secondary Terminals and Primary Terminals. These terminals are to be developed by the government. However, there is no commitment from the responsible government authorities to design and implement in construction of the proposed terminals. It is therefore feared that that unless measures are urgently taken to engage the relevant government authorities and secure their commitment, these project are unlikely to be undertaken as planned.

## **9.3 Road Plan**

The Master Plan has proposed the road plan that links the Satellite Cities, District Centers, Sub Centers and the CBD that consists of the Outer Ring Road, Middle Ring Road and the Bay Link Road. These proposed projects are to be implemented by the government through TANROADS and TARURA. However, there is no commitment from TANROADS and TARURA for implementation of the proposed Road Plan. Thus, if necessary measures in stakeholders' engagement and commitment of TANROADS and

TARURA will not be taken, the proposed Road Plan may remain in the Master Plan in shelves and TANROADS and TARURA continue with their own development projects out of the Master Plan proposals.

Also the Master Plan has proposed the road hierarchy that comprises of four levels. The first level consists of the expressway with 6 lanes 100-120km/h. the second level consists of the trunk road with 4 lanes 60-100km/h that comprises of ring road, trunk road and BRT road. The third level consists of regional road with 2 lanes 40-60km/h. The fourth level consists of collector road with 2 lanes 40km/h; feeder road with 2 lanes 30km/h; and community road with 2 lanes 30km/h. However, there is no commitment from TANROADS and TARURA to adopt the four level classification of road network with the respective number of lanes and speed. Thus, if necessary measures in stakeholders' engagement and commitment of TANROADS and TARURA will not be taken, the proposed road hierarchy with four levels, number of lanes and speed may remain in the Master Plan in shelves.

#### **9.4 Traffic Management Plan**

The Master Plan has proposed introduction of Advanced ITS that consists of MIRAI SMARTWAY, road with advanced technology. MIRAI stands for Multifunctional, Inter-regional, Resilient, And Innovative. This Advanced ITS is proposed to be implemented by the government through TANROADS and Police. However, it is not stated how this advanced technology imported from Japan fits the Tanzanian context of traffic management. Moreover, there is no commitment from TANROADS and Police to adopt this advanced technology.



## **10.0 CONCLUSIONS AND RECOMMENDATIONS**

### **10.1 Conclusions**

The Strategic Environmental Assessment for the DARTMP has provided the environmental and social implications of implementing the recommended transport plan alternative and measures to mitigate the negative implications of the plan and enhance the positive ones. Unclear status of the Physical Urban Master Plan (the designation of satellite cities, centers and corridors) that has been used as the foundation for developing the Transport Master Plan is a matter of concern. While in practice, the integration of the recommended physical urban master plan with recommended transport master plan would complement each other and should provide sustainable economic growth for the city of Dar es Salaam, there is urgent need to resolve its status and give it the legal backing it needs to be used as basis and foundation for the development of the Dar es Salaam City. Generally however, the recommended transport master plan is socially acceptable and environmentally viable.

The potential problems that still remain include: the integration of the preferred transport master plan with existing local government plans as highlighted in issues raised by stakeholders at Municipals and at other government sector's level; sourcing and availability of financial resources to implement the plan on time, and implementing the proposed mitigation and enhancement measures so as to achieve social, environmental and economic sustainability of the plan. The low involvement of the private sector in developing this transport master plan is a huge challenge because it can undermine the timely availability of financial and technical resources needed to move the plan ahead. Considerations need to be made with regard to mitigation of cumulative and residual environmental impacts such as land acquisition, air pollution, noise, pollution, increased population in Dar es Salaam and pressure on land and other services and road accidents that are likely to occur at a significant magnitude due to the implementation of this transport master plan.

Due to the nature of the plan itself, institutional coordination needs to be strengthened in terms of synchronizing planning of various activities related to DARTMP, with the

transport master plan activities since the various projects under the transport master plan will be implemented by different sectors other than the DCC itself. Other challenges include inadequate skilled manpower, and lack of capacity to coordinate and mainstream environmental issues in the sector responsible for this SEA as directed by the Tanzania Environmental Management Act, 2004.

## **10.2 Recommendations**

To ensure efficient, sustainable and socially accepted transport system in Dar es Salaam is developed, the following specific recommendations are provided to the key responsible institutions to take action.

### **10.2.1 Recommendations to PO RALG**

*(a) President's Office Regional Administration and Local Government and Ministry of Lands, Housing and Human Settlement Development will resolve the status of the Physical Urban Master Plan for Dar es Salaam*

The basis for developing the DARTMP has been the concept of the physical master plan of the Dar es Salaam city. PORALG and the Dar es Salaam City Council (DCC) shall align the updated DARTMP with the on going review of the Dar es Salaam City Master Plan (2012-2032) and link it with other sector Master Plans such as Storm Water Drainage, Sewerage Water Supply, Power Distribution, Urban Tourism and Marine Transport Plans, which also are likely to have significant environmental effect. By aligning the updated DARTMP with other plans, the later will then influence the shaping of those plans and remove any level of uncertainty or ambiguity which otherwise may affect the legitimacy of the transport master plan, which has been developed based on the assumption provided in the physical master plan.

*(b) President's Office Regional Administration and Local Government shall create an Institution that will coordinate and manage the Dare es Salaam Transport System.*

PORALG and the Dar es Salaam City Council (DCC) shall formulate a Dar es Salaam Metropolitan Authority in order to enhance the development of the Dar es Salaam city and create an institution that shall coordinate and manage transport infrastructure in Dar

es Salaam and its neighbouring regions that are closely connected in terms of transport needs. Both private and public sector service providers will be involved in that process so as to ensure greater participation. The institution to be created shall ensure it does not undermine the jurisdiction and functioning of the DCC. PORALG shall take up this issue and ensure that a structure is put in place as part of the Transport Master Plan development.

***(c) Dar es Salaam City Council in collaboration with the Ministry of Lands, Housing and human Settlement and PORALG shall develop a Dar es Salaam Urban Development Policy***

Dar es Salaam City is growing very fast but albeit haphazardly primarily due to among others, lack of a comprehensive urban policy. The development of transport infrastructure, which is spurred by the DSM physical master plan, is likely to trigger further expansion and growth. To be able to manage that growth, an urban development policy shall be put in place and enforced.

***(d) President's Office Regional Administration and Local Government shall acquire land for the planned transport infrastructure well in advance.***

A major concern from various stakeholders in Municipal Council and National Workshop is the issue regarding early acquisition of land for the proposed transport infrastructure so as to ensure people are not losing their investments in developments that will eventually have to be demolished when the implementation of the Transport Master plans starts. Early acquisition of land and protection of the way leave would avoid huge cost that would come if land were acquired later.

***(e) President's Office Regional Administration and Local Government and Dar es Salaam City Council shall enhance institutional coordination and collaboration among key stakeholders for the implementation of the transport master plan.***

Implementation of DARTMP requires an effective institutional coordination among the various Government sectors and within the various sections and department of various sectors as well as with the local government; private sector and NGOs in Dar es Salaam,

PORALG and DCC shall endeavor to ensure institutional coordination between and among various stakeholders is in place. Also, in order to avoid duplication and conflicts among key stakeholders and implementing agencies, DCC and PORLAG shall organize capacity development programmes for institutions that are key to the implementation of the plan so as to enhance the success of the plan implementation. Target institutions for capacity development shall include among others VPO-DOE, NEMC, PORALG and DCC and DSM Municipal Councils.

***(f) President's Office Regional Administration and Local Government and DCC shall ensure funding for the transport infrastructure is available.***

The proposed transport master plan will require significant investment and therefore, the PORALG and DCC shall ensure funding for the planned development is available so that plans are realized. PORALG shall need to engage the Ministry of Finance and Economic Development to initiate the process of resource mobilization both from within and outside sources.

***(g) President's Office Regional Administration and Local Government and DCC shall promote Public Private Partnership (PPP) for the implementation of the proposed DARTMP.***

Adopting a Public Private Partnership (PPP) in the implementation of DARTMP activities is key to unlocking financial limitation challenges. PORALG and DCC shall promote PPP in construction, operation and running of some activities planned under DARTMP.

***(h) President's Office Regional Administration and Local Government and DCC shall ensure detailed ESIA are undertaken for various projects under the DARTMP.***

The proposed transport alternative that will be developed will result in several specific projects (e.g. road projects, railway projects, flyover/intersections etc) that have to be subjected to detailed ESIA to comprehensively identify their environmental, social and economic impacts and suggest mitigation measures. The ESIA process is participatory

and therefore, PORALG and DCC shall ensure projects earmarked under the DARMTF are subjected to ESIA and the report used to inform design options.

### **10.2.2 Recommendations to JICA Study Team**

***(a) JICA Study team shall accommodate into the Transport Master Plan, TANROAD plans for the construction of 8 intersections.***

JICA Study team shall accommodate into the proposed Transport Master Plan TANROADs' 8 intersections planned to be developed in Dar es Salaam as Magomeni Intersection; Fire Intersection; Tabata Junction; Mandela/Uhuru Junction at Buguruni. Others are Mwenge Junction – Sam Nujoma/New Bagamoyo Road; Morocco Junction – New Bagamoyo/Kawawa Road; Ali Hassan Mwinyi/United Nations junction at Salender Bridge and Ali Hassan Mwinyi/Kinondoni Road junction at Salender Bridge. The JICA Study team has proposed construction of these structures at different locations and to be complete in phases between 2025 to 2040. TANROAD instead, has gone ahead to prepare feasibility and design for the intersections and it is understood that work will be complete by 2025. This planning needs to be harmonized and integrated into the Transport Master Plan.

***(b) JICA Study team shall accommodate into the Transport Master Plan, DART's Plans for the Phase 6 of Bus Rapid Transit (BRT).***

DART, which is managing the Bus Rapid Transit Services and infrastructure has plans to construct BRT Phase 6 from Morocco to Tegeta. This plan is not included in the proposed routes for BRT services in the proposed Transport Master Plan. This aspect needs to be harmonized and included in the plan as part of broader strategy so that work under DART is integrated with the rest of the plans.

***(c) JICA Study team shall address the issue of freight of cargo inside Dar es Salaam.***

The proposed Transport Master Plan is focusing more on transportation of passengers and people but says little about freight of cargo inside Dar es Salaam and how this activity is linked to the proposed transportation systems. There is a lot of cargo transportation inside the city and sometimes, this has been the cause of traffic jams and accidents. The

proposed Transport Master Plan thus, should reflect these aspects in the proposed Transport Master Plan.

***(d) JICA Study team to shall propose appropriate technology in the transport system***

Use of appropriate technology in the proposed transport master plan will minimize impacts such as size of land to be taken, pollution etc. Therefore, JICA study team should promote the use of such technologies including design solution and clean energy to reduce air pollution.

**10.2.3 Recommendation to Dar es Salaam Municipal Councils**

***(a) Councils shall intensify sensitization efforts to the communities***

Dar es Salaam Municipal Councils shall embark on an aggressive awareness-raising program using all available means of communication to sensitize people about the planned Transport Master Plan and proposed measures. Awareness and knowledge of what is intended is very low and this has implications in terms of support to the policy and buys in from the stakeholders that will be either positively or negatively impacted by the plan. This will be done by the Municipal Councils or by their consultants.

***(b) Councils shall address the issue of school going children***

Dar es Salaam is facing a serious problem of school going children, having no clear or effective policy on how school children can access and use public transport. A number of measures have been tried in the past but still large groups of children are seen in the morning and evening stranded at bus stops. This is an administrative matter that the Municipal Council shall address and be part of the overall transport master plan.

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## **12.0 ANNEXES**

### **12.1 Terms of Reference for Strategic Environmental Assessment (SEA) for Updating of the Dar es Salaam Transport Master Plan**

#### **Introduction**

Dar es Salaam City is the most populated city and an important centre for economy and commerce in Tanzania. The city is also a principal regional gateway for Tanzania and surrounding (landlocked) countries linking the city and region to other predominantly European and Asian world cities. Dar es Salaam is one of the world's fastest growing cities, and it has reached its tipping point. The City is now choked with increasing and expanding urban transportation challenges that have caused not only huge economic losses but also environmental, social, health, safety and security risks. While transportation challenges have been increasing in Dar es Salaam, the city has been expanding in terms of administrative divisions, population and settlement compared to 2008 situation. Dar es Salaam has close to 5 million people and five administrative municipalities.

The increasing urban transport challenges have thus necessitated a review of the existing Urban Transport master Plan of 2008 that was prepared by JICA and has been ineffectively implemented. Among the projects proposed in the current Master Plan that was prepared in 2008 include; Tazara Junction Fly-over Project, and the New Bagamoyo Road Widening Project, both of which have been initiated using Japanese Grant Aid. EU finances the Nelson Mandela Road Widening Project; the Bus Rapid Transit (BRT) Project by the World Bank, and the Kigamboni Bridge Project by the Social Security Fund of Tanzania have been launched based on the current Master Plan. Following the approval of the current Master Plan, a JICA technical project called “Capacity Building Project for the Improvement of Dar es Salaam Transport” (CUPID) was implemented from 2010 to 2012. Currently the project is in its second Phase 2 (Sep 2014/ Sep 2017).

The current traffic demand in DSM is rapidly exceeding the previous demand forecast. In the current Master Plan, the future population of DSM (in 2018) was estimated at 4.3

million. However, it already reached 4.3 million in 2012 (Population and Housing Census 2012). According to the 2014 statistics, the population of the city could well be over 10 million in year 2030 (UN Department of Economic and Social Affairs, Population Division, World Urbanization Prospects 2014). The number of vehicle registration in DSM is also rapidly increasing by 14% annually, exceeding the 8.4% limit as per the current Master Plan.

The Ministry of Works, Transport and Communications (MOWTC, former Ministry of Transportation) has started the trial operation of the railway as a pilot project since 2011, which was not included in the current Master Plan. DSM is the main entry point for the transport corridor to the land locked countries such as Zambia, Burundi, Rwanda, and Uganda. It is also an important hub for the logistics. The current traffic issues in DSM affect the economic development of Tanzania, as well as that of neighboring hinterland countries. Under these circumstances, both the Governments of Tanzania and Japan have agreed to launch the Project on the revision of the DSM Urban Transport Master Plan.

The main objectives of the DSM Transport Master Plan are:

- To track and review the current Master Plan.
- To revise the Urban Transport Master Plan in Dar es Salaam (target year 2040).
- To conduct a pre-feasibility study for the selection of the priority projects based on the revised Urban Transport Master Plan.
- To develop capacity of counter parts.
- To contribute to the improvement of the traffic condition via the achievement of the above items.

The Master Plan is expected to come up with:

- Revised Urban Transport Master Plan for Dar es Salaam, in which the target year is set at 2040.
- Technical Transfer to formulate/revise Urban Transport Master Plan.???
- Facilitate exchange of information and opinions about the Urban Transport Master Plan among stakeholders from an early stage, agreements on the contents

of the Urban Transport Master Plan, selection of the priority projects and implementation of the suggested projects under the Master Plan.

The current SEA is undertaken in order to inform the planning process and to mainstream environmental considerations into the Urban Transport Master Plan. The overall objective of this SEA is to ensure that social, economic and biological/ecological considerations are fully integrated into the proposed Urban Transport Master Plan for Dar es Salaam. Given the potential trade-offs between competing development goals and the possible need for compromise in reconciling them, it is proposed to draw on “limits of acceptable use/change” principles to reinforce the SEA as a framework for long-term environmental and social management.

The Environmental Management Act of 2004 and its regulations of 2008 govern SEAs in Tanzania. Part II Section 4 of the Strategic Environmental Assessment Regulation, 2008) mentions key objectives of undertaking SEA as follows:

- (a) Ensure that environmental concerns are thoroughly taken in draft Bills, regulations, plans, strategies or programs.
- (b) Enable the public to contribute to the consideration of environmental concerns in the preparation of Bills, regulations, plans, strategies or programs.
- (c) Establish clear, transparent and effective procedures for formulation of Bills, regulations, plans, strategies or programs and
- (d) Integrate environmental concerns into measures and instruments designed to further sustainable development.

### **Objectives of these TOR**

The overall objective of these TOR is to ensure that a comprehensive and participatory Strategic Environmental Assessment (SEA) for the proposed Dar es Salaam Transport Master Plan is undertaken. The TOR outlines activities, methodology to be followed and the expected outputs.

### **Issues to be addressed in the Full SEA**

The issues to be addressed in the full SEA would include, but not be limited to the following:

#### ***Policy framework and baseline studies***

- Review of the existing national, regional and international policy frameworks and the natural and socio-economic environment;
- Identify the relationship between SEA and other policy instruments in decision making and establish mechanisms that ensure integrated decision making; Identify/determine criteria for assessment of the impacts, and
- Review of international safeguard policies including JICA, World Bank and other together with Tanzania policies and laws.

The criteria can be based on a wide range of sources including policy frameworks established at national environmental and sector legislation, SEA Guidelines as well as policies and strategies.

### **Possible SEA Environmental Objectives and Indicators**

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies which generally govern environmental protection objectives established at national or international levels e.g. the Environmental Management Act, 2004, and regulations for environmental protection as well as JICA guidelines and other International Finance Cooperation (IFC) such World Bank Safeguard Policies which are required to be implemented.

The SEOs are set out under a range of topics and are used as standards against which the provisions of the proposed plan and the alternatives are evaluated in order to help identify which provisions would be likely to result in significant environmental effects and where such effects would be likely to occur, if - in the case of adverse effects - unmitigated

The SEOs are linked to indicators which can facilitate monitoring the environmental effects of the proposed plan as well identifying targets which the Plan can help work towards. All SEOs, indicators and targets are provided on Table 1.

**Table 1: Possible SEA Environmental Objectives and Indicators**

<b>SEA Topic</b>	<b>Possible SEA Objectives</b>	<b>Possible SEA indicators: ways of, quantifying the baseline, prediction, and monitoring</b>
Biodiversity, flora and fauna	<ul style="list-style-type: none"> <li>• Avoid damage to designated wildlife and geological sites and protected species</li> <li>• Maintain biodiversity, avoiding irreversible losses</li> </ul>	<ul style="list-style-type: none"> <li>• Reported levels of damage to designated sites/species</li> <li>• Achievement of Biodiversity Action Plan targets</li> <li>• Reported condition of nationally important wildlife sites, Sites of Special Scientific Interest (SSSIs) etc.</li> </ul>
Population and human health	<ul style="list-style-type: none"> <li>• Create conditions to improve health and reduce health inequalities</li> <li>• Promote healthy living</li> <li>• Protect and enhance human health</li> <li>• Reduce and prevent crime, reduce fear of crime</li> <li>• Decrease noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>• Size of population serviced</li> <li>• Changes in demography</li> <li>• Years of healthy life expectancy / infant mortality rate</li> <li>• Mortality rate by cause</li> <li>• Recorded crimes per 1,000 population</li> <li>• Number of transport/pedestrian/cyclist road accidents</li> <li>• Number of people affected by ambient noise levels</li> <li>• Levels and frequency of floods</li> <li>• Levels of traffic congestions</li> <li>• Average speed of public transport</li> </ul>
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>• To contribute towards the protection of public assets and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of public assets and infrastructure such as: public open spaces, recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.)</li> </ul>
Water and soil	<ul style="list-style-type: none"> <li>• Limit water pollution to levels that do not</li> </ul>	<ul style="list-style-type: none"> <li>• Quality (biology and chemistry) of rivers, canals and freshwater bodies</li> </ul>

	<p>damage natural systems</p> <ul style="list-style-type: none"> <li>• Manage water abstraction, run-off and recharge within carrying capacity (including future capacity)</li> <li>• Reduce contamination, and safeguard soil quality and quantity.</li> <li>• Minimize waste, then re-use or recover it through recycling, composting or energy recovery.</li> <li>• Maintain and restore key ecological processes (e.g. hydrology, water quality, sea/lake bed, coastal processes)</li> </ul>	<ul style="list-style-type: none"> <li>• Quality and quantity of groundwater</li> <li>• Water use (by sector, including leakage), availability and proportions recycled</li> <li>• Water availability for water-dependent habitats, especially designated wetlands</li> <li>• Number of houses affected by subsidence, instability, etc.</li> <li>• Housing density</li> <li>• Waste disposed of in landfill contaminated</li> </ul>
Air	<ul style="list-style-type: none"> <li>• Limit air pollution to levels that do not damage natural systems.</li> <li>• Reduce respiratory illnesses</li> </ul>	<ul style="list-style-type: none"> <li>• Number of days of air pollution</li> <li>• levels of key air pollutants / by sector and per capita</li> <li>• Achievement of Emission Limit Values</li> <li>• Access to key services</li> <li>• Modal split traffic volumes</li> </ul>
Climate factors	<ul style="list-style-type: none"> <li>• Reduce greenhouse gas emissions.</li> <li>• Reduce vulnerability to the effects of climate change e.g. droughts, flooding, disruption to travel by extreme weather, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Levels electricity and gas use</li> <li>• electricity generated from renewable energy sources energy consumption per building and per occupant/household</li> <li>• Levels of carbon dioxide (CO<sub>2</sub>) emissions</li> <li>• Levels and frequency of flood risk</li> </ul>

Cultural heritage and landscape	<ul style="list-style-type: none"> <li>• Preserve historic buildings, archaeological sites and other culturally important features</li> <li>• Protect and enhance the landscape in affected areas</li> <li>• Value and protect diversity and local distinctiveness.</li> </ul>	<ul style="list-style-type: none"> <li>• Percentage of Listed Buildings and archaeological sites ‘at risk’</li> <li>• Building functionality: use, access, space</li> <li>• Building impact: form and materials, internal environment, urban and social integration, character and innovation</li> <li>• Percentage of land designated for particular quality or amenity value, including publicly accessible land and greenways</li> </ul>
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*Environmental and social issues*

**Pollution control / public nuisance**

- Air pollution
- Water pollution
- Solid waste and/or industrial waste discharge
- Soil contamination
- Noise and vibration
- Ground subsidence
- Odor
- Sedimentation

**Natural environment**

- Geographical conditions
- Geological conditions
- Soil erosion
- Fauna and flora
- Ground water
- Water bodies (River, Lakes, etc)
- Natural/ecological reserves and sanctuaries
- Local climate
- Global warming

**Social environment**

- Involuntary Resettlement
- Poor, indigenous, or ethnic people
- Local economies (employment, livelihood, etc.)
- Land use and utilization of local resources
- Water Use
- Existing social infrastructures and services
- Social institutions and community
- Misdistribution of benefits and damages
- Local conflicts of interest
- Cultural heritage
- Landscape
- Gender and Children's rights
- Infectious diseases such as HIV/AIDS
- Working conditions (including occupational safety)
- Public Hygiene
- Accident and Hazard

**Administrative and institutional issues**

- Consider effective institutional coordination mechanisms for development planning and implementation of the DARTMP in Dar es Salaam;
- Assess the institutional capacity for monitoring of the various impacts associated with the implementation of proposed development activities; and
- Assess the institutional capacity to carry out rapid and extensive repairs whenever needed to ensure continuous use of the transport systems.

**Technology and sustainability issues**

- Consider solid and liquid waste management and pollution control mechanisms associated with infrastructure development;
- Consider technological (construction) innovations to address the problem of storm/surface water management in flood prone areas;



### **Consideration of alternatives**

- Consider alternatives using a variety of methods including textual description, impact matrices, susceptibility maps, etc.

### **SEA Activities**

The SEA team shall undertake the following activities:

1. Consultation with various key public and stakeholders including, but not limited to the ones identified during scoping in order to capture their views and concerns regarding the proposed development plan.
2. Consideration of the spatial, temporal and institutional boundaries of the SEA
3. Description of the present physical, biological and socio-cultural environment (baseline) that would be directly and/or indirectly affected by the proposed development plan.
4. Consideration of potential plan alternatives and recommendation on the most sustainable option for implementation.
5. Consideration of all potential negative and positive impacts arising from the propose DARTMP.
6. Development of Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP).

### **Methodology**

Following VPO-DOE approval of the Scoping report and ToR, a full SEA will be carried out for the proposed Urban Transport Master Plan. The SEA team will undertake additional comprehensive consultations with relevant stakeholders to obtain further information about current environmental and social issues as well as feasible alternatives to address them. The following guiding steps will be followed.

- State the objectives of the proposed DARTMP and summarize the policy implications, including alternative trade-offs and constraints;
- Specify and assess the range of options for achieving the objectives, including the “do nothing” option;

- Consider the potential impacts (both positive and negative) on the environmental, socio-economic and cultural environment, including cumulative and residual impacts;
- Assess the significance of the impacts and provide possible mitigation or enhancement measures for the significant impacts to offset or enhance them.
- Using an appropriate method, value the costs and benefits of development alternatives and state the preferred option with reasons for the selection; and
- Propose a monitoring and evaluation strategy for the proposed plan.

A range of plausible alternatives will be considered including the “no action alternative, spatial, temporal and technological.” The key question to ask will be “*what is the preferred option?*” The SEA team will explore answers to this question through consultations, analysis, expert opinion and facts, and propose alternative scenarios based on the proposed strategic plan generic quest of achieving sustainable development that ensures that the planned activities are compatible with the local environmental conditions. Thus, analysis of alternatives will be based on the following criteria:

- Consideration of Environmental Protection objectives
- Contribution to economic growth;
- Environmental resilience and capacities;
- Population growth and demands;
- Nature and amount of employment;
- Level of investment and contribution to economic growth;
- Synergies;
- Associated risks; and
- Carrying capacity or limits of acceptable use/change.

Discussions on and identification of alternatives will revolve around the understanding of implications of proposed development on scales, locations, processes, inputs, demands and time or sequence among others.

Subsequently, President Office – Regional Administration and Local Government Authorities will prepare the draft-Strategic Environmental Assessment report and submit

to VPO-DOE. Following the review of the Draft SEA, comments from the public consultation will be recorded and, as appropriate, incorporated into the final-Strategic Environmental Assessment report. This will be submitted to MWTC and VPO-DOE for final approval and adoption.

The SEA report will consist of key elements and information that include:

- i. Title and location of the plan or undertaking;
- ii. Name of the proponent and contact;
- iii. Non-technical Executive summary;
- iv. Acknowledgement;
- v. List of Acronyms;
- vi. Introduction;
- vii. A description of the proposed Master Plan;
- viii. Policy, administrative and legal frameworks;
- ix. Situation or Baseline Conditions;
- x. Selection of Environmental Protection objectives
- xi. Public/Stakeholder Identification and Engagement;
- xii. Identification and Assessment of Alternative Options;
- xiii. Environmental and Social Economic Assessment of Preferred Alternative;
- xiv. Development of Management Options and Institutional Measures, including suggesting an Environmental and Social Management Framework;
- xv. Preparation of an Environmental Management and Monitoring Plan (EMP).
- xvi. Conclusions and Recommendations;
- xvii. References; and
- xviii. Appendices.

#### **Expertise/SEA Team**

- i. Socio-economist and Team Leader
- ii. Ecologist and Environmental analyst
- iii. Participatory Planning and Consultation specialist
- iv. Urban/Transportation Planner

- v. Oceanographer
- vi. Marine Zoologist
- vii. Terrestrial Plant Ecologist
- viii. Environmental Engineer
- ix. Archaeologist/Cultural heritage specialist

**Deliverables**

- (i) Draft- Strategic Environmental Assessment Report
- (ii) Final- Strategic Environmental Assessment Report

**Time frame**

The Full-SEA process shall take 4 months

## 12.2 Stakeholders Views and Concerns

### RAHCO AND TAZARA ON 17<sup>th</sup> JULY, 2017

The following are the issues raised from RAHCO and TAZARA Stakeholders.

- 1) RAHCO has prepared New Commuter Rail Design in Dar es Salaam City by using a Company from South Africa, called GIBB. Also Eight Japan Engineering Consultants Inc, Nippon Koei Co. Ltd, CTI Engineering International Co. Ltd and Metropolitan Expressway Co. Ltd have prepared the MRT Network in Dar es Salaam City through the Dar es Salaam Transport Master Plan. However, these are two different and uncoordinated plans/designs that do not support each other.

RAHCO has an opinion that CASE 3 of the Circular MRT Network is acceptable to them, but need to be amended to integrate the proposals of the New Commuter Rail Design.

- 2) RAHCO is constructing the Standard Gauge Rail (SGR) from Dar es Salaam to Morogoro in Phase One of which it runs from Dar es Salaam Port to Pugu in Dar es Salaam City. However, the Dar es Salaam Transport Master Plan has not considered the SGR in MRT and BRT Designs of which they are not supposed to interfere each other. This is likely to lead to conflicts among the three transport systems during construction and operation, and probably leading to unnecessary future costs to resolve.

RAHCO has an opinion that CASE 3 of the Circular MRT Network be amended to integrate the three designs (MRT, BRT and SGR) and take into account physical separation of the SGR.

- 3) RAHCO has a network of the Existing Meter Gauge Railway Line. However, the Dar es Salaam Transport Master Plan has not taken into account physical separation of the BRT at the points of Interchange where the roads cross the railway line.

RAHCO has an opinion that CASE 3 of the Circular MRT Network be amended to take into account physical separation of the BRT when crossing the Meter Gauge Railway Lines. This includes the location of embarking and disembarking platforms.

- 4) BRT has been planned in the Dar es Salaam Transport Master Plan to include long distant settlements such as Mbezi and Bunju outside the Circular MRT.

RAHCO has an opinion that CASE 3 of the Circular MRT Network be amended for BRT to cover short distance network of about 5 Kilometer from the City Centre and MRT and LRT to cover long distance of about 20 Kilometer from the City Centre.

Also RAHCO has an opinion that reserve areas for railway (LRT and MRT) should be provided in all BRT routes.

- 5) TAZARA Existing Commuter Train with CAPE Gauge Rail from Mwakange (Chanika) to TAZARA and their Proposed Commuter Train from Mwakange to Kurasini and Mtoni through Yombo is and will be a positive contribution to the improvement of transport in the dare s Salaam City, but have not been considered in the Dar es Salaam Transport Master Plan.

TAZARA has an opinion that CASE 3 of the Circular MRT Network be amended as follows:

- a) TAZARA Station as well as all Commuter Train Stations should be linked with BRT Stations.
- b) BRT should be extended to Mtoni in Mbagala and the proposed Commuter Train Station at Mtoni should be linked with BRT Station.

- 6) RAHCO and TAZARA both observed that they have not been well consulted in all MRT and BRT Plans through the Dar es Salaam Transport Master Plan, as such the two plans are not harmonized. Both insisted that they need to be consulted so as to harmonize railway plans in the Dar es Salaam City.
- 7) TAZARA observed that the expanded BRT, MRT and Commuter Train Systems at TAZARA junction are likely to attract a lot of people and activities with high chances of increased crime and insecurity and that measures should be taken in the designs on how to mitigate this.
- 8) RAHACO designs are considerate of minimizing land take and displacement of people and thus hiking increasing costs, by ensuring that where the rail/BRT

corridors are relatively narrow, the railway would be designed on stilts and leave the ground surface to BRT.

### **Dar Es Salaam City Council on 18<sup>th</sup> and 20<sup>th</sup> July, 2017**

The following are the issues raised from Dar es Salaam City Council stakeholders.

9) The Dar es Salaam Transport Master Plan does not relate with the Dar es Salaam Land Use Master Plan that both of them are in the final stages of their preparation. The following should be taken for illustration.

a) The Dar es Salaam Land Use Master Plan has proposed five Satellite Cities, which are Mabwe Pande, Luguluni, Pugu, Kigamboni and Kongowe. However, the Dar es Salaam Transport Master Plan has proposed ten Satellite Cities.

The Dar es Salaam City Council has an opinion that the number of Satellite Cities are too many and thus they should be reduce, possibly to be five or six.

b) The Dar es Salaam Transport Master Plan has proposed Sub Centers, such as Mwenge, Ubungo, Morocco, and Buguruni. However, the Dar es Salaam Land Use Master Plan **has not proposed** even a single Sub Centre.

The Dar es Salaam City Council has an opinion that the Consultants who are contracted to prepare the Dar es Salaam Transport Master Plan and the Dar es Salaam Land Use Master Plan have to be brought together for the purpose of harmonizing their proposals.

10) Pemba Mnazi Satellite City has been design by the Ministry of Lands, Housing and Human Settlements Development and land allocation for its development has been done to the Chinese. Title Deed has been prepared. It is designed as a Tourist City and it will include the following main land uses:

- a) Heavy Industry. It will be the biggest in the country
- b) Tourism Beach Hotels.
- c) Residential, etc.

However, this Satellite City is not in the Dar es Salaam Transport Master Plan

The Dar es Salaam City Council has an opinion that Kigamboni Satellite City should be dropped and be replaced by Pemba Mnazi Satellite City. Furthermore, because of heavy industry, this Satellite City should be connected with MRT and BRT

- 11) Mabwe Pande Satellite City has been design by Kinondoni Municipal Council. However, this Satellite City is not included in the Dar es Salaam Transport Master Plan.

The Dar es Salaam City Council has an opinion that Bunju Satellite City should be dropped and be replaced by Mabwe Pande Satellite City. This is simply because it has been designed already and thus it should be connected with BRT.

- 12) The Dar es Salaam City Council are designing Mbezi Luis Bus Terminal and Boko DAWASA Bus Terminal for upcountry buses. However, these bus terminals are not lined with the BRT Network.

The Dar es Salaam City Council has an opinion that Mbezi Luis and Boko DAWASA Bus Terminals should be linked with BRT Network facilities.

- 13) TANROADS have proposed the shortest route from the City Centre to Buyuni so as to reduce congestion from the Gongo la Mboto road. However, this route is not in the Dar es Salaam Transport Master Plan.

The Dar es Salaam City Council has an opinion that the new route proposed by TANROADS from the City Centre to Buyuni should be included in the DARTMP

- 14) Mbagala and Gongo la Mboto are highly populated areas in Dar es Salaam City and thus need to be well connected with MRT and not BRT.

- 15) Despite of being under one roof, the relevant experts from Dar es Salaam City Council were not consulted in preparation of the DARTMP. Thus each (DCC and DARTMP Team) was doing his/her own work without coordination.

The Dar es Salaam City Council has an opinion that key stakeholders such as DCC should be consulted in preparation of the DARTMP according to their areas of profession and thus harmonize their development proposals.



### **Ministry of Land, Housing and Human Settlement Development on 13<sup>th</sup> July 2017**

1. The MLHSD is aware of the proposed DARTMP and were consulted by JICA to give their views
2. The proposed satellite cities are also shown in the Dar es Salaam Land Use Master Plan, however, the Land Use Master Plan have not been finalized, although, it is in its final stage.
3. Although Bunju area is identified for establishment of Satellite City, various development activities including construction of modern houses are going, so there is a danger that during the implementation of the plan, compensation will be required. As an alternative to Bunju proposed satellite city, the Kinondoni municipal has identified Mabwepande area to be a satellite city. The land has been acquired by the municipal council and the area is currently, not developed as Bunju.
4. The land in all proposed area for satellite city are owned by individuals, except the Luguruni area. The land in Luguruni have been acquired, the National Housing Cooperation have been assigned by the government to develop the city. If the proposed plan for establishment of satellite cities and construction of BRT roads and Railway line, the implementers will need to acquire more land and therefore, a significant number of people who will relocated.
5. Since, the Land Use Plan is currently in preparation, optimal utilization of the proposed DARTMP will be affected, because, the proposed DARTMP was supposed be guided by the Dar es Salaam Land Use Master Plan.i
6. Since Dar es Salaam City population is growing and expanding very fast, it is important to have a transport master plan that will go beyond its administrative boundaries. Let us think Dar es Salaam at Metropolitan level, a city which is connected to other areas like Mkuranga, Bagamoyo and Kibaha. In order to implement this idea, there is a need to revisit our legal frameworks which provide an opportunity for municipals and districts councils to work in isolation in preparing development plans, including transport systems.

7. Railway transport should be given more attention because of its ability to carry massive number of people and cargo, durable and sustainable with less cost for maintenance.
8. Marine transport should be considered in the proposed DARTMP
9. Control mechanism to reduce pollution of air from carbon emission, noise pollution, vibration (from railway line) should be taken into account during the implementation of the plan. This will be done by using technologies and means of transport which are environmentally and socially friendly. Design measures should be taken to ensure safety and security of passengers, pedestrians and people with different disabilities.

**Hala Municipal Council on 17<sup>th</sup> July 2017**

1. The implementation of the proposed DARTMP will help reduce traffic congestion which is currently experienced in the city. This will help to improve the economy of the people.
2. Employment opportunities will be created during construction of different infrastructure and operation, especially, drivers, system operators etc.
3. Case 1, Railway incentive plan 1 is more preferable because the railway transport can carry many passengers at a time which can reduce the number cars in the road, hence, reduce the carbon emissions.
4. Land availability will be a major problem in the implementation of the plan, especially in areas where a new route will be created. This will require relocation and compensation.
5. The kind of train to be used for transportation should not pollute the environment
6. The development of satellite city in Pugu area will affect many people due to the developments which are taking place in the area including construction of modern houses. In order to avoid this situation, it is important for the government to identify the areas are planned for the development in order to demolition of houses and infrastructure.

### **DART on 26<sup>th</sup> July 2017**

1. In order to ensure smooth implementation of the proposed DARTMP, it is important to earmark all areas that will be used in order to avoid relocation of people and destruction of properties
2. The issue of land take should be considered now
3. Harmonization of activities by different stakeholders is important to avoid duplication or interference and conflict in implementing the plan, especially, in a situation where resources are scarce.
4. The current BRT infrastructures have considered people with different disabilities, in main bus stations there are provisions of wheelchairs for disabled people. Also, there are assistants to people with difficulty to access the buses. It emphasized, proposed DARTMP should also consider improving provisions of services to people with disabilities.
5. There is a need to raise awareness to public transport users to respect and protect the infrastructures to ensure its sustainability. For example, toilet facilities and dustbins in main bus stations are not properly used.
6. Use modern technology to ensure that the location of different utilities such as water pipes, underground telephone and electricity are known to contractors in order to avoid destruction and compensation of utilities. This can effectively work, if there is an integrated planning among different sectoral ministries.
7. Stakeholder's engagement is very important to ensure that the public is well informed about what is going on or will happen in the future.
8. Car parking is an important thing to consider in the implementation of DARTMP as it will encourage more people to use public transport.

### **TANROADS on 20<sup>th</sup> July 2017**

#### **Julius Luhuro –Senior Environmentalist**

- TANROADS is aware on the proposed revision of Dar es Salaam Urban Master Plan; were visited and informed by JICA

- It is good initiative because Dar es Salaam City is facing with major challenges in transport mainly associated with relying on few major roads; these roads are narrow and unfriendly junction.
- TANROADS and local governments have major stakes in the city transport system, however local government own more roads within the city compared to TANROADS which deal with major roads only but we normally work up to even local government road to make sure that traffic are moving smoothly therefore local government need to be empowered.
- TANROADS have several roads projects aiming at enhancing movement of vehicle in the city; however the efforts to restrain these challenges has been drawn back by increase of vehicles and people in the City compared to the capacity of TANROADS in implementing road project
- This Urban Transport Master Plan is good and may assist to control traffic movement in Dar es Salaam City. However need to be effectively implemented; we need convenient master plan
- Dar es Salaam City has Master Plan, it would be important that this DARTMP are incorporated into the City Master Plan to enable patent during implementation
- The propose DARTMP is not expected to interfere with our plan or disrupt our existing road but will complement because we are working toward the same objectives i.e. improvement of transport system
- Town planning is crucial in the transport system; Municipal Council need to make sure that the social services are distributed to avoid movement of traffic in one direction during pick hours.
- We have major planned projects which are expected to lessen traffic; these include PPP Dar es Salaam – Chalinze road from Dar es Salaam port, widening New Bagamoyo road from Tegeta to CBD to four lanes as well as a number of ring roads.

## **Environmental Issues**

- With regard to the current transport system there are high generations of carbon dioxide because vehicles are spend more time on the road (high air pollution).
- Effective Master Plan will result into effective transport system provided it will be implemented as planned this will result into reducing fuel consumption and low air pollution.
- Environmental effect expected from the propose DARTMP will generally be during implementation of specific project especially during construction; therefore impacts will includes waste generation and management, soil erosion and siltation, air pollution as well as disruption of other infrastructure such as water pipes and telecommunication system.

#### **Kigamboni Municipal Council on 13<sup>th</sup> July 2017**

- Municipal officials reported that they were not aware of the Dar es Salaam Transport Master Plan (DARTMP due to the fact that Kigamboni is a new municipal which was established in 2016 from Temeke Municipal. Some of the staffs including the then Temeke Municipal engineer who were reported to have been involved in the initials stages of DARTMP have been transferred to Manyara region.
- The rate of in migration in Kigamboni Municipal is very high compared to the past where out migration was high. The influx of people has increased the population in Kigamboni which go together with creation of more business Centers which may a need a well-planned infrastructure and residential places. According to land use planners at KMC, Kigamboni municipal can still be easily planned. This is an advantage over other municipals in Dar es Salaam city thus integration of municipal plans into DARTMP is very possible and can easily be implemented.
- Lack of coordination in planning process is one of the challenge facing the municipality. Each plan is implemented without considering the other. For example, there is little understanding of the connection between New Kigamboni City and DARTMP. Most of the development partners including investors are still

confused with Kigamboni City that was once proposed some few years ago. This has paralyzed most of the development projects in the municipal.

- Top down approach in implementing plans; the stakeholders are not well informed of the plans. Need for creating awareness. Involvement of municipal and other development stakeholders is very pertinent in the forthcoming stages in the review and implementation of DARTMP.
- Delayed implementation, such that it is difficult to accommodate the changes that have happened between planning and implementation.
- Priority should be given to railway as it is fast and cheap. This should go along with water ways transport such as water mini-bus. This is because considerable part of Kigamboni can be reached from the rest of the Dar es Salaam city through water. The DARTMP should consider developing water tunnels into the Kigamboni city centers.
- To manage and diverge traffic jam into the city center in Kigamboni, Diversification of services and business centres is important. This may include specialized fish markets at different points in KMC, Dry port which is connected by railway from the Dar es Salaam port, and development of satellite cities.
- Space for entertainment is also important element to be considered in DARTMP.

#### **Ubungo Municipal Council on 21<sup>st</sup>.07.2017**

- Case 2 with railway incentive plan 2 is preferred, since railway will have mass rapid transport and simply transportation of people quickly
- Railway is much more durable therefore service is guaranteed for much long time compared to roads.
- Case 2 however will have massive land take and compensation issues, because to have the land for roads and railway within the same corridor will demolish significant number of properties.

- If railway will be opted then the technology adopted should be those train that use electricity for quick and environmental friendly services. considering that the master plan is to cover 30 years to come then the technology should be modern
- Design of the railway should consider easy access for crossing, either over pass or underpass for pedestrians and other uses to minimize delay /use of traffic light etc.
- The magnitude of resettlement will be high since the planned programme are not known to local communities and the city continues to grow rapidly. For this master plan all corridors for infrastructure development should be demarked and made known to local communities to avoid future demolition.
- How does the master plan integrated with planed programme at municipal levels, because the municipal has its own development plan, of which the master plan should accommodate in order to avoid conflict.
- Proper land use plan be developed along the corridors chosen for development, example business park combined in all railway or BRT stations
- Proper institutional coordination in planning and implementing various development plans including this master plan.
- Actual ground trothing to relate the plan on papers with implemented structures on the ground.

#### **Temeke Municipal Council on 25<sup>th</sup> July 2017**

- The revision of Dar es Salaam transport Master Plan may to consider including other access roads such as Temeke Mwisho to Tandika as well as Mbagala – Chamazi-Mbande linking to Chanika. These roads save more people because the areas are highly populated. Railway line could be more convenient.
- Compensation for the Temeke – Tandika road has been covered and therefore implementation of the plan would not have any objection.
- It is high time to All roads are considering one CBD in Dar es Salaam, we need to consider initiating other CBD such as in Kongowe in Temeke Municipal.

- The current railway transport is not effective most locomotive are old, need to be improved. The proposed DARTMP need to consider railway connecting all 5 municipals
- Currently time waste on roads to working places is too long because we rely on small public transport making use of many buses per unity time which generate more pollution
- The DARTMP need to consider wide perceptive looking more to Mkuranga than Kongowe as well as to Bagamoyo rather than Bunju. In addition consider maximizing water use as means of transport.
- Design and implementation of the DARTMP should consider environmental and social issues at early stage; a good example is BRT which started operation without toilets at bus stations. High congestion of people in BRT stations during pick hours which may result contamination and spread of diseases.
- System of waste collection and disposal should be considered, currently is not good.
- The revised master transport plan to consider encouraging use of trains and large buses this will result into reduced pollution.
- Currently road network is major problem; many are unpaved and very narrow
- . Kongowe area is developing very fast and the area is relatively low. In addition there are two major rivers around this area namely Mkozi and Mzinga, therefore the DARTMP need to take into account these issues to avoid disruption of human activities as well as control flood. There is a need to learn from technical mistake encountered at Jangwani area for the BRT
- Initially we thought BRT would have been a good example of changing behavior but was not the case as system at bus stations are not working as well as toilets are missing in several areas. Therefore the proposed master plan should avoid this.
- Need also to consider beautification along the road



- Integration of plans is very important such as TANESCO, Water; urban planning should be integrated at once.
- Drainage system has been a problem to several road projects.

### **Kinondoni Municipal Council**

*In Kinondoni Municipal Council stakeholders meeting was conducted on 24<sup>th</sup> July 2017. The meeting involved officials from Kinondoni Municipal Council and all Ward Executive officers from the respective wards.*

- The proposed plan is timely, given the challenge of transport in the city, however, it important to ensure that during the implementation of the plan the laws, regulations and policies in related to environment should be abided.
- In order to ensure smooth and sustainable implementation of the proposed plan, it is important to ensure that the local communities are fully involved in the planning process.
- Waste water management is one of the challenges during the construction of road infrastructure. Therefore, there is need for involvement of various sectors in the planning process. The proposed plan should be in harmony with the existing or proposed water infrastructure in the City. Example TANROADS and DAWASA should work together in the designing so as to minimize water pollution and unnecessary cost to the government.
- With reference to the implemented BRT, community entrances to access their homes and business areas has been blocked.
- Water transport through Indian Ocean should be incorporated in the plan but marine environment should be well assessed.
- Parking facilities was mentioned as a big challenge, the proposed plan need should consider how to address the challenge.
- The implementation of the proposed plan is likely to cause demolition of properties and land acquisition, especially in areas where transport infrastructure will be developed for the first time, the issue of resettlement and relocation need to considered in advance.

- A maximum utilization of road reserves and available way leave is advised in order to avoid resettlement problems
- Storm water control is also a problem in the development of city infrastructures; this should be well planned and incorporated in the DARTMP. In Kindondoni Municipality Mwenge area and Africana were mentioned as good examples with a big storm water problems.
- They have concerned that development of public services in the city automatically could be a major source of air and water pollution which is likely to increase air pollution due to increased emissions. This should be well mitigated by implementing environmental friendly technology to minimize air pollution which can harm people's life.
- However, the development could increase the level of risks and hazards therefore, Risk assessment should done prior to the projects implementation.
- Ward the officers have concerned that DARTMP to go beyond Dar es Salaam, there is no way the plan can exclude districts adjacent Dar es Salaam such as Mkuranga, Bagamoyo and Kibaha as they have a direct link to the city and these are the major entrances to the city.
- Kinondoni Municipal in collaboration with National Housing Cooperation has planned to develop a satellite city in Kawe area, how is the proposed DARTMP have taken into account the proposed plan for a satellite city?

**Ministry of Agriculture, Livestock and Fisheries: 24/07/2017**

The consultations were carried out with ten (10) Senior Officers, of whom 7 were female and 3 of the male gender. Responses accorded to as per issue were:

**Issue 1: Awareness on the existence of the Dar es Salaam Transport Master Plan Document**

**Response:** All respondents echoed that, they were familiar with the Projects being implemented, but had no prior knowledge on the existence of the Master Plan document, indicating that there was probably very low sharing of the contents of the Master Plan.

**Issue 2: Transportation of food and agricultural crops from peri-urban areas to the City Centre**

**Response:** The major food and agricultural crops from the peri-urban areas to the City Centre were reported to be vegetables and tomatoes whose shelf life is comparatively short. It was reported that efficient transport to be attained through the implementation of the projects would reduce the perishability of these crops, thus ensuring quality of the products as well as health to consumers.

**Recommendations:** The Team recommended that feeder roads should be improved within the framework of the projects.

**Issue 3: Enhanced fishing activities**

**Response:** The responding team considered efficiency in the transport system that will act as an incentive to fishers who reside far away from the fishing grounds. Fishing time will also be effectively utilized because travel time will be reduced. Successful implementation of the project has the potential of drawing more players into harvesting of fish resources, thus enhancing fishing activities.

**Issue 4: Fish post-harvest losses**

**Response:** Participants to the consultations explained that the quality of harvested fish decreases with prolonged keeping time. Most of the fish is not kept in cold condition to maintain its quality. Efficient transportation will enable acquisition of quality fish with minimal post-harvest losses.

**Issue 5: Pollution on crops grown in peri-urban areas**

**Response:** Information on the pollution on crops grown in peri-urban areas could not be obtained.

**Issue 6: Transport of fish from the landing sites/beaches to markets/consumers away from the City Centre**

**Response:** Respondents acknowledged that efficiency in the transport system would also enhance efficiency and effectiveness in transporting fish from the landing sites/beaches to markets/consumers away from the City Centre, thus increasing the level and reliability of fish trade.

**Issue 7: Upliftment of socio-economic status for both fisher folk and peri-urban farmers**

**Response:** Team members argued that successful implementation of the project will increase the volume and quality of fish and farmed products that will be marketed timely and frequently. Fishers and farmers income will be assured and meet their needs sustainably and thus increasing and maintaining the socio-economic status.

**Issue 7: Pressure on fish/food/crop handling facilities**

**Response:** It was narrated that both fish and food crops require cold storage facility when not put into sales. Efficiency in the transport system will act as incentive to traders, because during the times of plenty, the products may be required to be stored at low temperature. It is therefore considered by the respondents that the need for handling facilities will increase.

**General recommendations:**

- (i) Improve feeder roads
- (ii) Consideration be made on the fact that government services have effectively been moved to Dodoma as a Capital City of Tanzania
- (iii) Consider increasing the lifetime of the Master Plan
- (iv) Consider Railway from Bagamoyo to Dar es Salaam to cater for industrial goods from the Export Processing Zone
- (v) Improve public transport with a view to discouraging use of personal vehicles. Levy could be applied to the use of personal cars.

**Marine Parks and Reserves Unit (MPRU): 25/07/2017**

The consultations were carried out with two (2) Senior Officers of the female gender.

**Issue 1: Awareness on the existence of the Dar es Salaam Transport Master Plan Document**

**Response:** Both respondents echoed that, they were familiar with the Projects being implemented, but had no prior knowledge on the existence of the Master Plan document, indicating that there is probably very low sharing of the contents of the Master Plan.

**Issue 2: Tourism volume in Dar es Salaam Marine Reserves**

**Response:** Respondents acknowledged that, successful implementation of the five Projects (TAZARA Junction Fly-over, New Bagamoyo Road Widening, Nelson Mandela Road Widening, Bus Rapid Transit and Kigamboni Bridge Project) will more likely result in conveniently high flow of both foreign and local tourists into the Dar es Salaam Marine Reserves as areas of tourist attraction. The high flow will result into a higher number of tourists per unit time with consequent high level of revenue collection.

**Issue 3: Deterioration of marine habitats/ecosystems e.g. coral reefs, seagrass beds**

**Response:** It was pointed out by the respondents that, the increased volume of tourism brought about by efficiency in transport system, has the potential of an increased level of marine ecosystem deterioration. However, adequate Laws and Regulations pertaining to marine deterioration brought about by deliberate human activities are in place, and that MPRU has the capacity for effective enforcement. Moreover, it was pointed out that, efficiency in the transport system will improve over-land movement logistics on the part of MPRU during enforcement activities

**Issue 4: Pollution of beaches and near shore habitats**

**Response:** Respondents argued that the greater number of tourists so attained will be accompanied with pollution of beaches and near shore habitats. The situation will unlikely persist in marine reserves areas because of the adequate existing Laws and Regulation of which the MPRU has the capacity for effective enforcement and that

efficiency in the transport system will again improve over-land movement logistics on the part of MPRU during enforcement activities. The MPRU Team present in the consultation session hoped that pollution of beaches and near shore habitats in areas other than marine parks and reserves would be managed by appropriate Institutions.

**Issue 5: Conflicts between fisher-folk and tourism operators/tourists**

**Response:** The MPRU Team informed that, presently the Institution has not experienced incidences of conflicts between fishers and tourism operators/tourists. It was pointed out that fishing in marine reserves waters is illegal and that fishing in marine parks waters is effectively controlled.

**Issue 6: Enforcement cost**

**Response:** The MPRU Team argued that, the anticipated increase in the number of tourists implies that the activities of tourism will take place over a wider geographical area within the marine parks and reserves area. A wider area will imply the application of more human resources, equipment, facilities and materials, thus an increase of enforcement cost.

**General Recommendation:**

The MPRU Team recommended that the Bus Rapid Transit Project extends its road network up to the Airport in order to enable tourists enjoy the facility right from the point of entry thus promoting tourism right from the point of entry into Dar es Salaam.

**Ministry of Water and Irrigation and DAWASA on 19<sup>th</sup> July, 2017**

10 members attended the meeting from the Ministry of Water and irrigation and one member from DAWASA (names and signatures are attached). The purpose of the Dar es Salaam Transport Master Plan (DARTMP) was introduced and explained briefly.

**General comments:**

- Stakeholders from rural and urban water supply departments (MoWI) insisted on the Water quality to be considered in the Dar es Salaam Transport Master Plan. Drains should not be directed into rivers (the 4 main rivers of Dar es Salaam).
- There is a huge water source project in Kimbiji Mpera in which one third of water in Dar es Salaam will be coming from that area. Therefore, stakeholders insisted on the Kimbiji Mpera Well field to be integrated in the DARTMP so as to minimize sector conflicts and unnecessary cost that might be incurred in the future. They also insisted on the proposed satellite cities to be integrated on the other plans such as Dar es Salaam Land Use master plan and DARTMP. For example the water table in Pugu Kazimzumbwe which is among the proposed satellite cities is close to the surface, thus the satellite city should not disturb this as it is a collection point of water. There is the need to complete Dar es Salaam land use plan so that it can be incorporated in the DARTMP.
- DAWASA is currently undertaking SEA on “Kimbiji Mpera well field, one of the proposed satellite cities in the DARTMP. It has also prepared a sewerage system master plan, therefore, it is important that the implementation of the proposed DARTMP take into account the present plans in relation to water systems. The responsible authorities should work together to avoid unnecessary costs that might occur due to demolition of water infrastructure during the implementation of the plan.
- However, Water infrastructure was mentioned as a big challenge in Dar es Salaam City, DAWASA usually plans and implement projects but they ended up disrupted by other plans such as BRT. DAWASA water pipe lines are not allowed to use TANROADS way leave they only allowed where necessary and no option is by paying annual fees to TANROADS. Stakeholders from DAWASA insisted on the integrated of different sectors into plans.

- The MoWI members were worried on the time frame of the plan. Why the year 2040 chosen for the plan? It sounds too short period for a plan-it should be reconsidered in a way that future adjustment can be accommodated.
- Water availability currently is not a big challenge if the water sources continue to be well protected. More water currently available from Lower and Upper Ruvu translates to added waste water; thus this should be considered in the plan. However, the officers advised DARTMP to go beyond Dar es Salaam, there is no way the plan can exclude districts adjacent Dar es Salaam such as Mkuranga, Bagamoyo and Kibaha
- The local communities should be involved at the beginning of the plan so as to have positive impacts and sustainable plans.

**Consultations with the Ministry of Health, Community Development, Genders, Seniors and Children – 26<sup>th</sup> July 2017**

The following are the issues raised from the Ministry.

- The Ministry of Health was concerned that implementation of the plan would lead to major (cumulative) damming and extensive flooding in many low-lying areas in the City causing a lot of discomfort to residents as well as rampant health hazards including epidemic diseases like typhoid, malaria, diarrhea.  
*To deal with such problems, it is recommended that the responsible institutions should be enabled to establish baseline data on storm and surface water generation in various areas in the city and carry out monitoring to establish and predict trends.*
- The Ministry was concerned that such major construction and operational activities would be associated with many accidents leading to costly medication/ treatment and loss of life as well as having the few hospitals chocked with patients.  
*To minimize the problems it was recommended that the plan should ensure that a number well equipped health centers are established along all the trunk roads for fast attention, as well as awareness training*



- The Ministry was also concerned that particularly during operation, buses and trains would generate a lot of noise and vibrations which could cause a lot of disturbance in sensitive areas such as schools, hospitals and courts.
- Furthermore, the ministry was concerned about safety and security as well as accessibility and movements of the disabled at intersections and terminals

**Ministry of Works, Transport and Communication on 24<sup>th</sup> 07.2017**

- The ministry support the model which combine the different transport system, especially including railway in city transport system is good
- Railway will contribute to reduced number of busses and congestions in the city and eventually pollution will be minimized
- The plan should focus on the scenario with more railways, actually additional of more railways will be a good idea. The ministry will organise a meeting to include other department relevant to have a detail discussion
- the time frame for the master plan is short, 30 years is still not enough, at least to have a master plan which cover 50 years
- The plan is good as it consider both roads and railways unlike the previous plan which focused only on roads.
- The master plan should add more railways with standard gauge that will operate using modern wagons as the existing structures still consider old designed coach. worldwide cape and meter gauge wagons are phasing out, thus we should be planning for modern infrastructures that will use modern technology in operation
- The scope of the master plan should be expanded to cover nearby towns of Bagamoyo, Mkuranga, Kibaha, up to Chalinze considering if we will adopt electric trains as commuter transport
- How does the master plan integrate the transport outside the city, for example are we going to put bus terminal outside the city to cater for up-countries buses. the master plan need to have that provision

- The master plan should be detailed enough to indicate how airports, ports and other transport terminals are integrated, and how these transports are integrated to each other
- Provision of large parking areas for private vehicles for those intended to use brt or trains or any public transport
- The plan should think of reducing BRT and replace with a network of railways and trains
- All railway should be separated from roads including the crossing or intersection areas. for rapid /speed train it should be bounded by fence to avoid risks of accidents particularly for pedestrians crossing
- Source of energy for operation should be electricity not diesel to minimize level of pollution from vehicles emissions
- All regulations, laws and guidelines governing the operation of roads and railway should be strictly observed and followed.

### **Ministry of Home Affairs**

#### **SACP Fortunatusi Musilimu – Chief of Traffic**

#### **ASP Deus Sokoni - Co-Legal Department of Traffic**

It is good proposal, however, it was suggested that proposed Dar es Salaam Master Plan should consider linking with the existing Tanzania Road Safety Master Plan. There are key issues that need to be considered in order to have good and sustainable transport master plan. These include the following: -

- **Land use;**

Land use is very important in order to be able to implement this master plan. Long term planning on land use is important. Dar es Salaam has complex land use systems; therefore it is important to look carefully on selection of type of infrastructure to be implemented. It is important to consider infrastructure which can be implemented easily, but with highly significant impact e.g. Railway lines which carry relatively more people than bus transport. Dar es Salaam also needs smooth movement of traffic.

- **Infrastructure;**

Dar es Salaam and Tanzania in general have different types of roads, for various uses (i.e. for pedestrian, motorcycles, car, trucks as well as pushcart). Considering that the current road safety awareness is very low, making transport system more complicated. We need demarcated road systems which clearly differentiate road type and use. For example, there are no emergency roads to support emergencies such as police, fire and health supporting vehicles (e.g. ambulance).

Also, public transport should be owned by companies with large bus carrying capacities as opposed to the current situation where everybody even with a single mini-bus can register to put it on the road for public transportation. Traffic police recommend five (5) companies to be formed to manage road system. Each company should be assigned to manage one system in order to ensure efficiency, e.g.

- i. CBD to Mbagala
- ii. CBD to Gongolamboto
- iii. CBD Via Uhuru to Tabata - Segerea
- iv. CBD to Mbezi
- v. CBD to Bagamoyo

This way, it would be easy to monitor and control public transport in Dar es Salaam and improve private transport.

- **City Plan;**

It is important to consider the location of infrastructure vis-à-vis the demand. Dar es Salaam has one major problem whereby all major economic activities and services such as offices, hospitals and businesses are concentrated in one area (the City Centre). Re-distribution of services would reduce traffic congestion in the city.

There are ongoing operational conflicts between Dar es Salaam City Council and Dar es Salaam Municipalities e.g. in implementing urban planning resulting into delays or failure to implement some of the plans. Also there is a need to prohibit vendors doing businesses along roads and parking areas. Furthermore, public transport system should be designed in such a way that buses are transporting people in a circular way so as to avoid dead road ends.

- **Population**

The proposed Dar es Salaam Transport Master Plan must consider population distribution and associated rates of increase in the same.

- **Parking System**

There is need to enforce parking behind the main buildings to allow free movement of vehicles; in addition, DCC need to prohibit building owners to blocking parking areas in front of their buildings.

- **Traffic lights**

Currently traffic lights are not assisting in controlling free movement of cars, forcing traffic police to spend most of their time handling movement of cars on the road junctions instead of using traffic lights.

Alternative roads (minor roads) – Roads which support main roads in order to allow people divert in case of heavy traffic or any problem on the main road.

Sea/water transport need also to be considered because it is very important but needs long term planning that would include synchronization with other means of transport in the city.

#### **Kimbiiji Ward – Kigamboni Municipality – 23th November 2017**

- Land take and resettlement- there was a concern that in many places the establishment road infrastructure and satellite cities have associated with land take and resettlement issues. In many cases people are fairly and timely compensated. Therefore, it is important for the proposed plan to take into consideration the process of land acquisition and compensation of properties that will be affected by the proposed plan.
- Creation of economic and employment opportunities. The development of road and railway infrastructure and satellite city in Kimbiiji will certainly lead to creation of job opportunities in the ward and Kigamboni municipal in general which will range from skilled and unskilled labour.
- In order to reduce the magnitude of impact and avoid unnecessary disturbances to the people, the route for the proposed roads, railways and satellite cities should be known in advance.

- Kimbiji ward still have enough space which have not been developed, therefore, the proposed satellite city should be located in area which is not developed in terms of settlements and farms in order to avoid impacts to the communities.

**Kawe Ward in Kinondoni Municipality on 19<sup>th</sup> December, 2017.**

Kawe ward development Committee was consulted and were concerned on the following

- The plan is accepted but laws, regulations and policies such as Environmental laws and policies such as environmental, water and land policies should be abided. In case peoples properties will be affected.
- The local communities in the respective wards should be involved in the entire process of the plan so as to have positive impacts and sustainable plans.
- There is a proposed railway line in the past years from Wazo, Mbezi beach up to Mwenge, it is advised DARTMP to make use of the past proposed plan.
- Storm water was reported as a huge problem in the implementation of road infrastructures in Dar es salaam City. Mwenge-Tegeta road was mentioned as an example which has been a major cause of floods settlements. This has been associated with poor design. Therefore, the designers are requested to ensure proper design to avoid floods in human settlements.
- Solid and liquid waste generation during construction and operation phases could haphazardly increase and if will not be properly managed it's likely to create problems to the community. Therefore environment bylaws to curb this problem should be introduced and proper enforcement mechanism should be proposed. However, waste collection bins should be implemented.
- Noise and Air pollutions are anticipated during construction and operation phases. Contractors and project owners should use machines that meet the proposed noise standards. In case of blasting which may create huge noise communities close to the sites should be notified. However, emission of vehicles and construction equipment should meet the proposed standards

- Vibration was mentioned as an anticipated impact during construction and operation phase. The distance between railway corridor and settlements should be observed so as to avoid vibration to the nearby buildings
- Risk and hazards such as accidents and fire should be mitigated; road sign posts should be put in place to avoid accidents. However, the proposed transport infrastructure should put into consideration the accessibility of the disables.
- In Kawe ward there is ongoing satellite city project, therefore implementation of transport infrastructures would facilitate the satellite city.

### **Consultation with Mabwepande Ward in Kinondoni Municipality**

Mabwepande ward development committee was consulted and had the following concerns in relation to proposed plan.

- The proposed plan is good but laws and policies should be abided
- Improvement of transport infrastructures will facilitate business and expansion of settlements. However, land value will increase as the improvement will attract more people in the area.
- Accidents will increase due to improved infrastructures, therefore proper mitigation such as speed limits should be proposed.
- Employment opportunities are anticipated - priority should be provided to the community in the area.
- Whenever the project touches people's properties, compensation should be fair and prompt.
- The plan is potential as it will reduce emission due to few vehicles that will carry many passengers.
- Vegetation clearance is a negative impact likely to happen, the proposed plans should avoid crossing in the forest or cleared vegetation should be replaced.
- Spread of communicable Diseases HIV/AIDS –government should implement by laws to govern the community on the communicable diseases. However awareness should clearly be provided to the entire community

- Disruption of Water utilities – the design should consider water infrastructure, there is a new water project that is going on in Mabwepande ward, and this should be accommodated in the plan so as to avoid unnecessary disruptions.
- Mabwepande is rapidly growing and there are a lot of plans such as Fertilizer industry, Abattoir, Water projects. Therefore, the proposed plan will be beneficial to the proposed projects.
- Population will rapidly increase due to infrastructure development therefore waste water generation will accordingly increase therefore stabilization ponds should be established. However, population growth should be considered in the plans.
- Solid waste will also increase therefore a waste disposal site should be established. Also public toilets should be placed at the stations to avoid environmental pollution and outbreaks.
- Vibrations should meet standards and proper mitigations should be proposed to avoid damages.
- Drainage systems should be well planned to avoid floods to the near settlements

#### **Consultation with Bunju ward development Committee**

- In Bunju there is a proposed satellite city project in Kilungule street, however, the proposed area has been invaded by people's settlement about one thousand buildings have been constructed in the area.
- Ministry of land has earmarked Bunju area as a proposed satellite City, but it has been shifted to Mabwepande ward due to land availability and insufficient land in Bunju.
- Construction of infrastructure such as road, railways it needs land because of that it is necessary for the government to allocate land for future plan infrastructure.
- During implementation of the project prompt and fair compensation should be adhered to.
- Government should prepare resettlement action plan for affected people's properties

- It is important for the government to earmark the area for future infrastructures such as road and railway to avoid high compensation cost during project implementation.
- Solid and liquid waste generation during construction and operation phases will increase Therefore proper mitigation measures should be proposed
- Environmental pollutions such as air and noise are anticipated during projects in the proposed plan, therefore proper mitigation measures

**Consultation with PO-RALG – Dr. Hante on the DARTMP – 27<sup>th</sup> December 2017  
(Telephone conversation)**

- There is need to ensure that our plans last long are participatory, collective and therefore sustainable. The DARTMP does not meet these qualifications, largely because it is coming ahead of the Physical Master Plan which is not ready yet! Should it proceed to implementation as it is, it is either going to last for a short time and then collapse, because it is likely to be in disagreement with the Physical Master plan. Therefore, it is neither collective nor integrated transport plan as it lacks outreach!
- The so-said “existing Physical Master Plan” was rejected by stakeholders as it was sectoral! It was wrong for the Ministry of Land to prepare the Physical Master Plan (making it sectoral). It should have been prepared by the Dar es Salaam City Council and it’s Local Government Authorities (that would make it non-sectoral).
- As it stands, the Ministry of Transport could start implementing the transport plan (once it is ready) without the basic foundation of the Physical Master Plan leading into total misuse of resources should the two plans not match at the end.
- He is for the DARTMP, but it is poorly integrated!



### **Tanzania Airport Authority – 27 April 2018**

- The proposed Dar es Salaam Transport Master Plan should take into account the current Tanzania Airport Master Plan. This is important to ensure that there is a good harmonization of infrastructure.
- The proposed development and designs of satellite cities should be done in accordance with Aviation standards which prohibit the construction of high building close to Airport in order to ensure smooth take-off and landing as well as for security purpose.
- Currently the transportation of fuel to the airport is undertaken by using vehicles. This has causing many traffic problems and air pollution due to emission. In order to reduce this problem, the proposed DTMP should consider the construction of railway line which will be used for transportation of fuel as well as passengers.
- According to the proposed DTMP, the location of road and railway does not provide direct access to the airport. Passengers will be required to walk a long distance to the airport. Therefore, the plan should consider a direct link from the road/railway to the airport.
- The proposed DTMP should consider the construction of emergency road for ambulance, firefighter vehicle and sidewalks for pedestrians and bicycle.
- In order to duplication of activities in the process of implementing certain plans, the preparation of various master plan and programs within the government should NOT be done in isolation.
- For better utilization of space and avoid demolition of properties and social disturbance, underground construction of some of infrastructure should be considered.

### **Consultation with Tanzania Tourist Board (TTB) 30<sup>TH</sup> April 2018**

- The implementation of the project will help to increase domestic tourism because it will reduce transportation cost, enhance security and ensure reliable transport
- Tourism and transportation are two important things that depend on each other, tourist need safe, secure and comfortable transport.

- Tourism to be achieved there must be good infrastructure for roads, buildings and recreation areas.
- This project will help save time spent on transport from one point to another, this will increase number of tourism in Dar es Salaam city especially those attending in conference and meeting.
- For the tourism sector to develop; there is a need to have special buses and road for the tourists to enable those who want tour in the city.
- There must be a link between Bus Rapid Transport (BRT) and Tourist attraction. In the Coastal region Bagamoyo is the area which receive many tourists from Dar es Salaam region, there is need to establish Bus Rapid transport (BRT) from Bunju to Bagamoyo to simplify movement of tourists.
- In Dar es Salaam port there is Cruise ship which carries more than eight hundred (800) guest, they come in different occasion and want to visit different location within a short time, when the project is implemented it will enable them to visit different place even outside the city such as Morogoro region within a short time.
- Upgrading of the transport system will ensure easy accessibility to the tourist centers in the wet and dry season; most of the tourists come to Dar es salaam in the high season from May to October because it is dry and most of the areas are accessible but during the low season from January to April, the number decreases since most of the areas are not easily accessible due to the heavy rains

**Consultation with Tanzania Rural and Urban Road Agency (TARURA) - Dar es Salaam Regional Coordinator 30<sup>th</sup> April 2018**

- Resettlement action plan for the associated projects will need to be very comprehensive because there are huge investments along projects expected sites. It would be better if land acquisition will be done at this period to avoid much compensation cost that will rise years later.
- Grievance handling mechanism should also be set to assist People that will be affected by the expected Projects, especially on issues of fair and timely compensation.

- Before development of these projects, implementing agency may consider of adopting the World Bank policy that consider even vendors along the road.
- Feeder roads should be much considered as to allow easy access of private vehicles to public transport, a good example is on the existing BRT in which feeder roads has been a challenge simply because it was not included in the plan and design.
- Establishment of reliable private car parking along public transport stations with reasonable charges in order to allow people from remote areas to leave their vehicles on safe hands when accessing the proposed public transportation.
- Environmental precaution should be considered during construction
- Flood prone areas would need to be designed properly using accurate data to avoid negative impacts.
- DARTMP is targeting 90% of people in Dar es Salaam to be using public transport; environmental and safety to users supposed to be in correspondence with investment goal.
- Road intersection points should be in non conflicting way in a sense that not to favor one side of the road, but creating interchange for smooth passage of all road users.
- Better storm water management system is to be put in place or even introducing the underground storm drainage.
- Establishment of damping sites and waste bins to avoid disposal of waste on drainage which may result into blockage of drainage system,
- The contractor will need to design a perfect way of placing ducts as not to affect other infrastructures like TANESCO electricity poles and water infrastructure.
- More importantly, implementing agents such as TANROADS, TARURA and DART should have coordination in developmental ideas so as to be coming out with a single plan and pull all resources together to avoid double budgeting.

#### **Consultation with Tanzania Ports Authority (TPA)**

- TPA is planning to establish a dry Port at Ruvu–Kwala area in order to reduce traffic around Dar es Salaam city; and railway line will be used to transfer cargos. There are

many trucks ferrying goods from Dar es Salaam Port which are creating chaotic traffic. Therefore the proposed DARTMP should incorporate the TPA plan.

- There are also heavy trucks that are ferrying goods from the port to within Dar es Salaam City Industries such as Nyerere road industrial areas, Mikocheni Industrial area etc. The proposed DARTMP should include railway lines to these industrial areas.
- Tanzania Port Authority is planning to construct flow meter in Kigamboni; increased movement of trucks is expected thus DARTMP should consider a link to Kigamboni in order to serves the expected increases traffic.
- TPA sometime service customers with heavy cargoes/abnormal which is normally create chaos to the city. The design of the DARTMP should accommodate the abnormal loads/goods.

**12.3 National workshop Proceedings**

**PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
AND LOCAL GOVERNMENT**

**NATIONAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)  
FOR UPDATING DAR ES SALAAM URBAN TRANSPORT MASTER PLAN  
CONDUCTED BY INSTITUTE OF RESOURCE ASSESSMENT OF UNIVERSITY OF  
DAR ES SALAAM  
UNDER THE COMMISSION OF JICA STUDY TEAM**

**MINUTES OF THE NATIONAL WORKSHOP**

**26<sup>TH</sup> JANUARY 2018**

## **OPENING**

The workshop commenced with opening remarks by the Ag. Permanent Secretary (PO-RALG) welcoming the participants to the workshop and explained the main objectives of the workshop and called for engaging stakeholders to contribute their views so as to update the Dar es salaam Transport Master Plan (DARTMP). The opening remark was followed by self-introductions from the participants.

## **PARTICIPANTS**

The workshop attendance comprised of representatives from different key stakeholders involved in transport, environment, land use, industries and higher learning institution. They werelargely from five municipal councils forming the Dar es Salaam City, Dar es Salaam City Council, nearby district councils of Bagamoyo, Kisarawe , Mkuranga and Kibaha Town Council. Others from the government and non-governmental sectors are NEMC, VPO, PORALG, TANROADS, DART, TANZANIA CHEMBERS OF COMMERCE, RAHCO and ARU. Also there was the JICA planning team that prepared the Dar es Salaam Transport Master Plan. List of participants is attached (appendix 2 of this workshop proceeding)

The Strategic Environment Assessment (SEA) Experts team from Institute of Resources Assessment (IRA) comprised of:

- Prof. Hussein Sosovele – presenter
- Prof. Raphael Mwalyosi- presenter
- Dr. Florian Silangwa - presenter
- Dr. Emmanuelli Mchome - presenter
- Dr. George Sangu – presenter and secretariat
- Mr. Anselm Silayo – secretariat
- Miss Teddy Philemon - secretariat

## **INTRODUCTION**

The aim of the Strategic Environmental Assessment to the Plan is part of the review of the existing master plan of 2008 to be used up to 2040 and beyond. The updating is intended to develop and operate a transport system that increases mobility, accessibility, safety, punctuality, affordability, comfortability, integration and flexibility. The idea is to realize a better future through building urban structures consisting of five corridors, the existing CBD, new Sub-centers, Satellite cities and new towns along the corridors and create a shift from private to public transport. The transport system proposed will help solve the current challenges of transport in the Dar es Salaam City including; traffic jam, poor quality roads, poor and inadequate storm water drains.

The SEA process for DARTMP employed different approaches and methodologies. The approach employed was to ensure that stakeholders are fully informed, involved and engaged in discussions on the Dar es salaam Transport Master Plan. Also, the approach used was both impact and institutional based to get information to address physical and human impacts. The main target of SEA approach was to ensure sustainability, and facilitate best alternative identification and ensure that a democratic decision making process facilitates the search of best alternative of the plan. The SEA methodology employed different principles including; integration, sustainability, participatory and interactive principles. Data was collected from primary and secondary sources via literature review, site visits and stakeholder's identification, analysis and engagement.

Among the challenges encountered during data collection process include; acquiring out-dated data and lack of clarity of the physical master plan. This SEA followed standard procedures and steps.

## **KEY ISSUES RAISED BY STAKEHOLDERS DURING THE NATIONAL WORKSHOP**

S/N	STAKEHOLDER	VIEWS/CONCERNS
1	ZEFARANI MADAYI-TANROADS	<ul style="list-style-type: none"> <li>• Satellite cities proposed by the plan are not what, the municipal authorities have planned to implement. For example, Kawe satellite city is not even mentioned in the plan</li> <li>• Why railway incentive! Plan (i.e. more concentration on railway), and not have another case 4 which is road incentive (concentrating more on roads)</li> </ul>
2	GEORGE JOSEPH – PO-RALG	<ul style="list-style-type: none"> <li>• The presentation has covered extensively on road, railway, but not on water transport to serve Kigamboni, Bagamoyo and other areas that can be better served by water ways</li> <li>• Satellite cities will help people outside Dar Es Salaam, and reduce number of people visiting and establishing settlements into the CBD thus minimizing congestion in the CBD</li> </ul>
3	ABRAHAM MAPUNDA Environmental Officer – Ilala Municipal Council	<ul style="list-style-type: none"> <li>• It is not clear how the concept of the physical master plan proposed does link or relate to the current transport master plan.</li> <li>• Are there any reference cities in the world that have adopted the proposed design for Dar es salaam</li> </ul>
4	SHABANI MARJANI – ARDHI UNIVERSITY	<ul style="list-style-type: none"> <li>• The proposed master plan should be overlaid on the present transport master plan.</li> <li>• Sustainability of the plan in terms of the rational for MRT to using electricity vis a vis industry, transport and other uses</li> </ul>
5	ZEFARANI MADAYI-TANROADS	<ul style="list-style-type: none"> <li>• Some of the Satellite cities like Kigamboni have not been mentioned at all in the plan</li> <li>• The proposed plan does not relate to the TANROAD priorities. For example, designs for 8 critical intersections which are already done are not matching with the priority for TANROADS plan.</li> </ul>
6	EDWIN HERMAN – DART	<ul style="list-style-type: none"> <li>• The expansion of BRT from Kimara to Mbezi is currently in progress, the other links should be Kimara to Tegeta or Mbezi to Tegeta</li> <li>• BRT phase 6 that is Morocco to Tegeta is missing in the plan</li> </ul>
7	MATESH DITO –RAHCO	<ul style="list-style-type: none"> <li>• The plan should consider freights of cargo, preferably using electricity energy</li> </ul>
8	AISHA NGAIZA – TEMEKE MUNICIPAL	<ul style="list-style-type: none"> <li>• Stakeholder involvement should also engage local communities up to the bottom so that information reaches the local levels</li> </ul>



9	EZRA GUYA - UBUNGO MUNICIPAL	<ul style="list-style-type: none"> <li>Distance between Mbezi and Luguruni Satellite cities is not big enough, therefore only one of them should be developed as satellite city</li> </ul>
10	STEPHEN F. KALUMBA - MUNICIPAL DIRECTOR - KIGAMBONI MUNICIPAL	<ul style="list-style-type: none"> <li>Although Kimbiji is proposed to be a satellite city in the proposed DARTMP, the Kigamboni municipality have earmarked Pemba Mnazi, Kisarawe II and Kimangila to be satellite cities and compensation for land and properties has already been done and construction has started, to house 200 industries in Pemba Mnazi area. Therefore the DARTMP should serve the proposed industries.</li> <li>For all proposed development sites, the acquired land should be appropriately compensated, and the municipal council should own the acquired land and compensation should be undertaken immediately to avoid future conflicts and reduce compensation costs</li> <li>Kigamboni Satellite city has been abandoned</li> </ul>
11	SIPORA KIHARA –DAR ES SALAAM CITY COUNCIL	<ul style="list-style-type: none"> <li>The proposed upcountry bus terminals at Mbezi Louis, Boko and Vikindu in Mkuranga should be linked with the BRT and/or MRT transport network.</li> <li>Bus terminals should link with all transport networks being proposed.</li> <li>Provision of infrastructure for non-motorized transport (bicycle and pedestrians) should be considered</li> <li>Encourage Dar es Salaam Rapid Transport (DART) to use gas on the BRT buses in order to reduce emission of gases to the atmosphere</li> <li>Functions of the proposed satellite cities should be revised to reflect the real requirement of satellite cities and to decongest the CBD.</li> <li>Provide measures to discourage private transport and improve public transport.</li> <li>There is a need to propose and institution to control and coordinate transportation issues in Dar es Salaam City.</li> <li>The special investment areas in Dar es Salaam should be linked with the proposed transport network.</li> </ul>
12	FATUMA O. CATS - DISTRICT EXECUTIVE DIRECTOR BAGAMOYO DISTRICT COUNCIL	<ul style="list-style-type: none"> <li>The proposed plan is good for the development and growth of the city, and should be continued.</li> </ul>

13	MUSA L GAMA DISTRICT EXECUTIVE DIRECTOR KISARAWA DISTRICT COUNCIL	<ul style="list-style-type: none"> <li>• Such Plan (DART) should be extended to nearby town /districts such as Kisarawe, Mkuranga, and Bagamoyo to avoid congestion spilling in the nearby town.</li> <li>• Early implementation of this proposed plan will the city to grow into a better living place.</li> <li>• The required land for the proposed plan should be acquired immediately and reserved so as to avoid high compensation cost in future.</li> </ul>
14	ENG.M.A.MUNDE DISTRICT EXECUTIVE DIRECTOR MKURANGA DISTRICT COUNCIL	<ul style="list-style-type: none"> <li>• In Mkuranga District there is a proposed investment area where industries will be established for converting petrol and diesel engines to gas engines. These industries should be linked to the transport system.</li> </ul>
15	MICHAELI NGOLE – DAR ES SALAAM REGIONAL OFFICE	<ul style="list-style-type: none"> <li>• Major bus stands such as Mbezi Luisi, Basihaya, and Vikindu will be area of heavy traffic congestion and therefore need to be linked to the proposed transport system.</li> <li>• Establish traffic node to support Kigamboni as a complex vehicle business area.</li> </ul>
16	ARNOLD MPINDUZI – NATIONAL ENVIRONMENT MANAGEMENT COUNCIL	<ul style="list-style-type: none"> <li>• The required land for the proposed plan should be acquired immediately, in order to avoid disturbance to people’s properties during implementation in future.</li> </ul>
17	MAGDALENA MKOCHA –TANZANIA CHAMBERS OF COMMERCE	<ul style="list-style-type: none"> <li>• Involvement of private sector will hasten implementation of the proposed plan.</li> <li>• It is important to ensure sustainable supply of electric power for implementation of the proposed plan. .</li> </ul>

## CLOSING REMARKS

The workshop was closed at 16:00 hrs by Ag. Permanent Secretary (PO-RALG), thanking the SEA team and workshop participants from Dodoma, Dar es Salaam and Coast Regions for attending.

## APPENDICES

### Appendix 1: Work shop time table

**Date:** 26 January 2018

**Venue:** Hazina Treasury Square Conference Hall, Dodoma

S/N	Time	Activity	Responsible Person
1	09:30 - 10:00	Registration	Anselm Silayo
2	10:00 - 10:10	Introductions	PO-RALG
3	10:10 - 10:20	Opening	Prof. Sosovele
4	10:20 - 10:40	Background to Dar es Salaam Urban Transport Master Plan	Prof. Sosovele
5	10:40 - 11:00	Coffee/Tea Break	All
6	11:00 - 11:15	TOR of SEA / SEA Methodology	Dr. Silangwa
7	11:15 - 11:45	Assessment and Selection of Alternatives and Evaluation of Selected Plan	Prof. Mwalyosi
8	11:45 - 12:15	Discussions	Dr. Mchome
9	12:15 - 12:30	Mitigation and Monitoring	Dr. Sangu
10	12:30 - 12:45	Conclusion and Recommendations	Dr. Mchome
11	12:45 - 13:15	Discussions	Prof. Sosovele
12	13:15 - 13:35	Way forward	Prof. Sosovele JICA Study Team PO-RALG
13	13:35 - 13:45	Closing	PO-RALG

**Appendix 2: List of Participants**

S/N	NAME	ORGANIZATION	POSITION	CONTRACT	EMAIL
1		Kisarawe District Council	District Executive Director (DED)		
2		PO-RALG	Senior Town Planning Officer		
3		Temeke Municipal Council	Environmental Management Officer		
4		Temeke Municipal Council	Municipal Planning and Statistics Officer		
5		PO-RALG	Town Planning Officer (IPO)		
6		PO-RALG	Ag District Information and Communication Technology (DICT)		
7		Ministry of Natural Resources and Tourism	Provincial Tourism Officer		
8		NEMC	Principle Environmental Officer (PEMO)		
9		Kigamboni Municipal Council	Municipal Director		
10		RAS – Pwani Region	Regional Administration Secretary		
11		DART	Town Planning Officer		
12		UDOM	Participant		
13		Tanzania Chamber of Commerce, Industry and Agriculture	Director for Agriculture Development		
14		Ardhi University	Lecturer		

\* Personal information such as name of participants, phone number and e-mail address were removed from the list of participants to protect personal information.

15	Ubungo Municipal Council	Municipal Environmental Management Officer
16	TANROADS	Head of Safety and Environment
17	Ilala Municipal Council	Head of Department .Environmental
18	Bagamoyo District Council	District Executive Director
20	PO-RALG	Land Officer
21	PO-RALG	Geographical Information System (GIS)
22	PO-RALG	Senior Land Officer
23	Ubungo Municipal Council	Town Planning Officer
24	PO-RALG	Planner
25	PO-RALG	Quantity Surveyor
26	PO-RALG	Engineer
27	Mkuranga District Council	District Executive Director
28	RS DSM	AAS Infrastructure
29	PO-RALG	Town Planning Officer (TPO)
30	JICA Study Team	Environmental and Social Considerations
31	JICA Study Team	Engineer

32		JICA Study Team	Deputy Team Leader Urban Planning	
33		Ubungo Municipal Council	Municipal Director	
34		PO-RALG	Information Communication Technology Officer (ICTO)	
35		Chalinze District Council	District Executive Director	
36		Dar Es Salaam City Council	City Director	
37		Vice –President Office	PEOE	
38		RAHCO	Signal and Telecom Engineer	

**Appendix 3: Photographs taken during National SEA workshop**



**The guest of honor opening the workshop**

Sources: National SEA workshop - 26th January2018



**SEA Team presenting results to participants**

Sources: National SEA workshop - 26th January2018



**Stakeholders commenting on the presentation**

Sources: National SEA workshop - 26th January 2018



## **12.4 Municipal Workshop Proceedings**

**PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
AND LOCAL GOVERNMENT**

**MUNICIPAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT  
(SEA) FOR UPDATING DAR ES SALAAM URBAN TRANSPORT MASTER PLAN**

**CONDUCTED BY INSTITUTE OF RESOURCE ASSESSMENT OF UNIVERSITY OF  
DAR ES SALAAM**

**UNDER THE COMMISSION OF JICA STUDY TEAM**

### **MINUTES OF THE MUNICIPAL WORKSHOP**

**VENUE:** KINONDONI MUNICIPAL COUNCIL

**TIME:** 010:20-02:10

**DATE:** 15TH JANUARY 2018

## **AGENDA**

To inform the Dar es salaam Municipal Councils about the ongoing process of Strategic Environmental Assessment (SEA) as part of updating the Dar es salaam Transport Master Plan and obtain their contributions/views.

## **PARTICIPANTS**

The workshop comprised of representatives from the five municipal councils including Ilala, Temeke, Ubungo, Kinondoni and Kigamboni, representing different departments of environment, land, urban planning, community development, water and forestry. List of participants in attendance is attached (appendix 2 of this municipal workshop proceeding)

The members of IRA SEA team included:

- Prof Hussein Sosovele- Presenter
- Prof Raphael Mwalyosi-Presenter
- Dr Florian Silangwa-Presenter
- Dr George Sangu-Presenter
- Mr Alexander Chambi-Presenter
- Bernadina Kelvin-Secretariat
- Mjuni Kajuna-Secretariat
- Agnes Francis-Secretariat
- Neema Massawe-Secretariat
- Leonard Masai-Secretariat

## **INTRODUCTION**

The workshop commenced with opening remarks from Professor Hussein Sosovele who welcomed the participants to the workshop and explained the main objectives of the workshop and need for engaging stakeholders in the process of updating the Dar es salaam Transport Master Plan (DARTMP). He then welcomed all the participants to introduce themselves.



**Plate 1: Professor Sosovele Introducing the Workshop Objectives to the Participants**

Source: Municipal SEA Workshop - 15th January 2018

## **SUMMARY OF PRESENTATIONS**

### **Introduction by Professor Hussein Sosovele**

Prof Hussein Sosovele started with a review of the current master plan of June 2008 and said that the plan intended to create a tool that will deal with transport. The review is intended to improve the current plan of 2008 that will be used up to 2040 and beyond.

He then gave brief information about the Dar es Salaam city and the status of transport there in. He said that there is a need to have a good transport system that will serve the population of Dar es Salaam due to the rapid population increase projected to be 15,000,000 by 2040 and associated increase in density and number of vehicles.

The transport system proposed will have a Central Business District (CBD) and sub-centers, Satellite cities and corridors. The transport proposed will help solve the current challenges of transport in the city including; traffic jam, poor quality of roads, inadequacy in storm water

drains, air pollution, stress, accidents and delays in reaching destinations. The proposed plan intends to create a transport system that is punctual, safe, comfortable, accessible and affordable.

The proposed plan will have two main means of transport including road and railway. The roads will be of different types; express ways will have 6 lanes, ring roads, trunk roads- 4 lanes, regional roads- 2 lanes and Bay link road. The roads will be constructed in three phases; 2025, 2030 and 2040 with flyovers and express ways in different stages.

The public transport will comprise of two systems; BRT (DAR ES SALAAM RAPID TRANSIT) extensions and Railway. The latter will operate many trains including underground ones whereby total construction will cost US\$ 40 million to US \$ 200 million. The construction of these infrastructure will need flyovers at Ubungo, Trains, 10 hectares of land for a central station and electricity (53 MW).

He finally explained that SEA is conducted as a requirement of section 104 & 105 of the Environmental Management Act (EMA) of 2004.

### **SEA Approach and Methodology by Alexander Chambi**

The SEA process for DARTMP employed different approaches and methodologies. The approach was both impact- and institutional- based to get information to address physical and human impacts. The main target of SEA approach was to ensure sustainability, facilitate selection of best alternative and ensure a democratic decision-making process.

The SEA methodology employed different principles including; Integration, Sustainability, Participatory and Interactive principles. Data was collected from primary and secondary sources including literature review, site visits and stakeholder engagement and participation.

Among the challenges encountered during the data collection process include; acquiring outdated data and lack of clarity of the physical master plan itself.

### **Public Consultation and Participation by Doctor Silangwa**

Public consultation and participation was conducted in accordance with the EMA ACT of 2004 and JICA requirements. During the SEA process for DARTMP, different stakeholders were consulted including; TAMISEMI, VPO, Ministry of Construction, Ministry of Finance, Dar es salaam City Council, DART, TANROADS, Five Municipal Councils, Ministry of Land, Traffic and Ministry of Industries, Tanzania Truck Owners Association (TATOA), Energy and Ministry of Natural Resources and Tourism in order to get their views and concerns with regard to updating the DARTMP.

The views and concerns from stakeholders were mainly environmental, institutional and administrative, socio-economic, as well as with regard to implementation and sustainability, technology and land use plan. Some of the concerns include; proposed infrastructure crossing steep slopes, flood prone areas and pollution; land take, inadequate institutional and sector coordination and collaboration; and absence of an acceptable Dar es Salaam Physical Land Use Master Plan.

### **Selection and Assessment of Plan Alternatives- by Professor Raphael Mwalyosi**

The main objective of the assessment is to find out whether or not the plan is viable based on selected Environmental Protection Objectives (EPO). He presented four alternatives including Case 0 alternative, BRT Incentive alternative and Railway Incentive plan 1 and Railway Incentive Plan 2.

Recommended Environmental Protection Objectives were used to assess and choose a scenario/alternative with least negative impacts on the environment. Among the EPO include; maintain landscape quality and countryside quality, maintain available biodiversity in the city, preserve historic and cultural sites, sensitive places and protect and enhance water quality.

The comparison of plan alternatives was based on different aspects; the more the negative scores, the worst the alternative. Railway incentive plan 2 was picked as the preferred DARTMP because it has the least negative scores.

The preferred DARTMP would still lead to some positive and negative impacts. The positive impacts include; enhanced economic and social welfare of the people, employment generation opportunities, improved transportation and efficient traffic movement.

The negative impacts of the plan on the other hand include; land take and displacement, disruption of public infrastructure, loss of biodiversity, and poor water resources and sustainable use.



**Plate 3: Professor Mwalyosi explaining to the Workshop Participants about Alternatives**

Source: Municipal SEA Workshop - 15th January 2018

### **Mitigation and Monitoring – by Doctor George Sangu**

The mitigation measures presented aims to minimise risks and improving harmful effects of natural and social systems while maximising benefits through enhancement measures. The enhancement measures include; enhanced socio-economic and welfare of the people,

employment and job creation, improved transportation, efficient traffic movement and enhanced air quality. He discussed about the mitigation measures and emphasized on the need for having a monitoring plan that will constitute data collection and environmental indicators to follow-up progress for the efficient proposed master plan

However, he also said that it is important to develop measures that will indicate when and where environmental and social problems are apparent and unacceptable/intolerable, needing management intervention in order to avoid any harmful impacts to the community.

### **Important Issues Discussed in the Workshop**

- The areas where the railways will be constructed should be mapped so that the community is aware of the areas and not develop those areas so that their properties are not destroyed in the future due to land acquisition.
- The stakeholders should start thinking of funding for the DARTMP, they should mobilize resources from private and public sector in order to ensure enough resources for the implementation of the plan. For example the construction of 1 km of the road will cost 20,000,000 to 200,000,000.
- There is a need to integrate the DARTMP with the plans of other regions such as Morogoro

## SUMMARY OF VIEWS AND CONCERNS OF STAKEHOLDERS

STAKEHOLDERS	VIEWS/ CONCERNS
<p>Baraka Masoro Ag. Municipal Water Engineer Temeke Municipal Council</p>	<ul style="list-style-type: none"> <li>• All the municipalities around Dar es Salaam should have been involved in this Strategic Environmental Assessment for DARTMP rather than only basing on the Dar es salaam city because this master plan will affect them in one way or the other either for social or economic reasons.</li> </ul>
<p>Ramadhani Mabula Ag. Municipal Water Engineer Ubungo Municipal Council</p>	<ul style="list-style-type: none"> <li>• When will this Strategic Environmental Assessment study for Dar es Salaam Master plan end?</li> <li>• Will this master plan consider the existing infrastructures during its implementation? Especially sewage systems in which only 10% of the total area is currently covered</li> </ul>
<p>Rose A. Mpeleta Ag. Municipal Council Development Officer Ubungo Municipal Council</p>	<ul style="list-style-type: none"> <li>• The community should be informed about the DARTMP especially on areas where the transport system will be constructed and if possible immediately acquire the necessary land along those areas so as to avoid continued development of such areas and later cause land use conflicts, disturbance destruction of peoples properties in future.</li> <li>• There is need to look at the best form of transport system whether its Railway or Road (Buses) so as to bring about balance and avoid any future inconvenience.</li> <li>• The community as whole should have been involved in the process and not only the government institutions.</li> <li>• The councilors would have been more comfortable and effective if they had access to the SEA or once completed.</li> </ul>



## **Conclusion and Recommendations- by Doctor Silangwa**

### ***Conclusion***

The proposed DARTMP is economically viable, socially acceptable and environmental friendly. However, there are several challenges that have been noted including; various environmental and social impacts, unclear and weak institutional arrangement, lack of financial assurance, and inadequate recognition and acceptability of the proposed physical plan.

### ***Recommendations***

- All mitigation measures should be implemented to ensure that the plan realizes the desired objective.
- There is need to mobilize resources to finance the proposed DARTMP
- Promote Public Private Partnership (PPP) in the implementation of the proposed DARTMP

## **The Way Forward- by Professor Hussein Sosovele**

- Incorporate comments from the workshop to improve the SEA report;
- Undertake National Workshop in Dodoma on 26 Jan 2018
- Incorporate comments from National Workshop stakeholders to improve the SEA Report
- Submit final report to PO-RALG (President's )ffice Regional and Local Government) and finally to Vice President's office (VPO)

## APPENDICES

### Appendix 1: Workshop Timetable

S/N	Time	Activities	Responsible Persons
1	09.30 - 10.00	Registration	Agnes and Neema
2	10.00 – 10.10	Introduction	Prof Mwalyosi
3	10.10 – 10. 30	Background to Dar es Salaam Transport Master Plan <ul style="list-style-type: none"> <li>• Transport issues in Dar es Salaam and proposed new Transport Arrangement</li> <li>• Objective of the DARTMP</li> <li>• Requirement for SEA</li> </ul>	Prof. Sosovele
4	10.30 – 10.45	SEA Methodology <ul style="list-style-type: none"> <li>• Literature Review</li> <li>• Site visit</li> <li>• Stakeholders engagement</li> <li>• Consideration of alternatives</li> </ul>	Mr. Chambi
5	10.45 -11.05	Public Participation and Engagement	Dr. Silangwa
6	11.05 – 11. 25	Assessment and Selection of Plan Alternatives	Prof. Mwalyosi
7	11.25 – 11.45	Evaluation of Impacts of the Selected Plan	Prof. Mwalyosi
8	11.45 – 12.00	Mitigation and Monitoring	Dr. Sangu
9	12.00 – 12.15	Conclusion and Recommendation	Dr. Silangwa
10	12.15 – 12.45	Discussion and Suggestions	Prof. Sosovele Agnes, Mjuni
11	12.45 – 13.00	Way forward and closing	Prof. Sosovele

**Appendix 2: List of Participants**

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL
1		Ubungo Municipal Council	Land Officer		
2		Ubungo Municipal Council	Ag. Municipal Council Development Officer		
3		Kinondoni Municipal Council	Ag. Municipal Council Development Officer& Youth		
4		Ilala Municipal Council	Ag. Municipal Council Development Officer		
5		Kinondoni Municipal Council	Municipal Environmental Management Officer		
6		Kinondoni Municipal Council	Information Communication Technology Officer		
7		Temeke Municipal Council	Municipal Planning and Statistics Officer		
8		Kinondoni Municipal Council	Forest Officer		
9		Kinondoni Municipal Council	Land Officer		
10		Temeke Municipal Council	Ag. Municipal community development officer		

\* Personal information such as name of participants, phone number and e-mail address were removed from the list of participants to protect personal information.

11	Kigamboni Municipality Council	Environmental Management officer	
12	Ubungo Municipal Council	Municipal Urban Planning Officer	
13	Temeke Municipal Council	Ag. Municipal water engineer	
14	Kinondoni Municipal Council	Town Planning Officer	
15	Kinondoni Municipal Council	Town Planning Officer	
16	Temeke Municipal Council	Natural Resource Officer	
17	Ubungo Municipal Council	Municipal Environmental Management Officer	
18	Ilala Municipal Council	Municipal Environmental Management Officer	
19	Kinondoni Municipal Council	Ag. Municipal water engineer	
20	Ubungo Municipality Council	Ag. Municipal Water Engineer	
21	Temeke Municipal Council	Environmental Management Officer	

22		Kinondoni Municipal Council	Economist	
23		Institute of Resource Assessment	Presenter	
24		Institute of Resource Assessment	Presenter	
25		Institute of Resource Assessment	Presenter	
26		Institute of Resource Assessment	Presenter	
27		Institute of Resource Assessment	Presenter	
28		Institute of Resource Assessment	Secretariat	
29		Institute of Resource Assessment	Secretariat	
30		Institute of Resource Assessment	Secretariat	
31		Institute of Resource Assessment	Secretariat	
32		Institute of Resource Assessment	Secretariat	

### Appendix 3: Photographs



**Plate 4: One of the Participants from the Workshop giving out their views during the discussion**

Source: Municipal SEA Workshop - 15th January 2018



**Plate 5: One of the Participants from the Workshop giving out views**

Source: Municipal SEA Workshop - 15th January 2018

## 12.5 Names and Signatures of Stakeholders Consulted

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS

ILALA MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		MEMO	IMC - Mawazini	17/07/2017		
2		3-KIVUKONI WEO	IMC-KIVUKONI	17/07/2017		
3		PUGET	IMC-	17/07/2017		
4		MCHAFUKOGE WEO	IMC	17/07/2017		
5		(GEZANI) WEO	IMC(GEZANI)	17/07/2017		
6		EMO	IMC	17/07/2017		
7		EMO	IMC	-		
8		CDO	IMC	17/07/2017		
9		EMO	IMC	17/07/2017		
10		KIYUBO	IMC	17.07.2017		
11		UKONGA WEO	IMC	17/07/2017		
12		TPO	IMC	17/7/2017		
13		TPO	IMC	17/7/2017		
14		WEDA	IMC	17/07/2017		
15		GONGO DAMBOTO WEO	IMC	17/07/2017		
16		KIPATA WEO	IMC	17/7/2017		
17		KIANGUANI WEO	IMC	17/7/2017		
18		WEO	IMC	17/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS

ILALA MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
01		WEO	IMC-KIYUBO	17.07.2017		

\* Personal information such as name of participants, phone number and e-mail address were removed from the list of participants to protect personal information.

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS - KIGAMRONI MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		Ag. Head of Department	KIGAMRONI MC	13/07/2017		
2		MLO	KIGMC	13/07/2017		
3		SLS	-11-	-11-		
4		STPO	-11-	-11-		
5		SCO	-11-	-11-		
6		Ag. Planning	-11-	-11-		
7		WHD	-11-	-11-		
8		ECO	-11-	-11-		
09		ECONOMIST	-11-	-11-		
10		STATISTICIAN	-11-	-11-		
11		PLANNING	-11-	-11-		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS - TEMBEKE MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		WEO	TMC	25/07/2017		
2		Ag. MPSC	TMC	25/07/2017		
3		MUNICIPAL	TMC	25/07/2017		
4		SD	TMC	11		
5		WEO-MBONI	TMC	25/07/2017		
6		SCDO-NIOM	TMC	25/07/2017		
7		EHO-TMC	TMC	25/07/2017		
8		MEMO-TMC	TMC	25/07/2017		
9		EMO	TMC	25/07/2017		
10		AMED CAD	KILAKALA	25/07/2017		
11		MCDO	TMC	25/07/2017		
12		WEO	KILAKALA	25/07/2017		
13		CAD	KURASHI	25/07/2017		
14		WEO-TBR	TANDIKA	25/07/2017		
15		WEO	TANGUMBA	25/07/2017		
16		WEO-CHAMALI	TMC	25/07/2017		
17		CDO	VITUKA	25/07/2017		
18		WEO	SANDALI	25/07/2017		
19		WEO	KURASHI	25/07/2017		



STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT  
MASTER PLAN

KINONDONI MUNICIPAL COUNCIL  
LIST OF STAKEHOLDERS

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
01		Memo	KMC	24/07/2017		
02		TPO	KMC	24/07/2017		
03		WEO	KMC	24/07/2017		
04		AGWEO	KMC	24/07/2017		
05		P.FO	KMC	24/07/2017		
06		WEO	KMC	24/07/2017		
07		WEO	KMC	24/07/2017		
08		EHO	KMC	24/07/2017		
09		EHO	KMC	24/07/2017		
10		EHO	KMC	24/07/2017		
11		EHO	KMC	24/07/2017		
12		EHO	KMC	24/07/2017		
13		TPO	KMC	24/07/17		
14		WEO	KMC	24/07/2017		
15		WEO	KMC	24/07/2017		
16		WEO	KMC	24/07/2017		
17		CC	KMC	24/07/2017		
18		Mudatano	KMC	24/07/2017		
19		CM-TARURA	KINONDONI	24/07/2017		
20		EVO	KMC	24/07/2017		
21		WEO	KMC	24/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT  
MASTER PLAN

KINONDONI MUNICIPAL COUNCIL  
LIST OF STAKEHOLDERS

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		AS	Kinondoni MC	24/07/17		
2		CIVIL ENGINEER	Kinondoni MC	24/07/17		
3		MRE	"	"		
4		MIA	"	24/07/17		
5		AGWEO	"	24/07/17		
6		EHO	"	24/07/17		
7		WEO	"	24/07/2017		
8		WEO	"	24/07/2017		
9		CPD	"	24/07/2017		
10		CPD	"	24/07/2017		
11		WEO	"	24/07/2017		
12		WEO	KMC	24/07/2017		
13		CPD	KMC	24/07/2017		
14		CC	KMC	24/07/2017		
15		WEO	KMC	24/07/2017		
16		MHRO	KMC	24/07/2017		
17		HRO	KMC	24/07/2017		
18		HRO	KMC	24/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
KINONDONI MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1.		for MD	KMC	24/07/2017		
2.		for Kithoo	KMC	24/07/2017		
3.		cc	KMC	24/07/2017		
4.		MESO	KMC	24/07/17		
5.		MFI CO	KMC	24/07/2017		
6.		MPEO	KMC	24/07/2017		
7.		DO	KMC	24/07/2017		
8.		MPRO	KMC	24/07/2017		
9.		MESO	KMC	24/07/2017		
10.		MESO	KMC	24/07/2017		
11.		WEO	KMC	24/07/2017		
12.		WEO KIKOYANI	KMC	24/07/2017		
13.		WEO MAKONDO	KMC	24/07/2017		
14.		WEO TANZANIA	KMC	24/07/2017		
15.		WEO MAFATIWI	KMC	24/07/2017		
16.		WEO-KASE	KMC	24/07/2017		
17.		WEO-MWANA	KMC	24/07/2017		
18.		ICT	KMC	24/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
LBUNGO MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		ME	UMC	21/07/17		
2		Environmental Health Officer	UMC	21/07/2017		
3.		COMMITTEE CLERK	UMC	21/07/2017		
4.		Environment Officer	UMC	21/07/2017		
5		COMMITTEE CLERK	UMC	21/07/2017		
6.		Chairman	UMC	21/07/2017		
7		Quantity Surveyor	UMC	21/07/2017		
8		PMU	UMC	21/07/2017		
9.		M/MISJI	UMC	21/07/2017		
10.		WEO	MBERI WARD	21/07/2017		
11.		WEO	MAKUMBA	21/07/2017		
12.		WEO	MAKUMBA	21/07/2017		
13.		WEO	MISGAMI	21/07/2017		
14		WEO	UMC	21/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT  
MASTER PLAN

LIST OF STAKEHOLDERS  
UBUNGWE MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		WEO	SANDALI	21/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT  
MASTER PLAN

LIST OF STAKEHOLDERS  
TEMEKE MUNICIPAL COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		MSEO	TEMEKE M.C.	25/7/17		
2		MEO	TEMEKE M.C.	25/07/2017		
3		EMNO	TEMEKE M.C.	25/07/2017		
4		STD	UDOM	25/7/2017		
5		WEO	CHAZAMBE	25/7/2017		
6		CDO	CHAZAMBE	25/7/2017		
7		STD	UDOM	25/7/2017		
8		STA	UDOM	25/7/2017		
9		STD	UDOM	25/7/2017		
10		STD	UDOM	25/7/2017		
11		STD	UDOM	25/07/2017		
12		STD	UDOM	25/07/2017		
13		STD	UDOM	25/07/2017		
14		IS	TMC			
15		MRE	TMC			
16		WEO	TMC/VIUNGA	25/07/2017		
17		CDO	SANDALI	25/07/2017		
18		WEO	KETKO	25/07/2017		
19		SIT-Agmm	MASI	0713374096 25/7/17		
20		WEO	TEMEKE	25/7/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1.		Ag. Dir	DART	26/07/2017		
2		Ag. Hq. M/W	DART	26/07/2017		
3		Ag. M/W	DART	26/07/2017		
4		Ag. M/W	DART	26/07/2017		
5		Ag. M/W	DART	26/07/2017		
6		PSO	DART	26/07/2017		
7		PT	DART	26/07/2017		
8		LO	DART	26/07/2017		
9		LO	DART	26/07/2017		
10		TP	DART	26/07/2017		
11		TP	DART	- - -		
12		SPOM	DART	- - -		
13		Ag. En	- - -	- - -		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS

RAIL HOLDING COMPANY LTD TAZARA

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		Ag. Dir	RAHCO	17.07.2017		
2		PS. Mgr-S&A	RAHCO	17.07.2017		
3		As. Mgr-S&A	RAHCO	17.07.2017		
4		JRID	TAZARA HQ	17.07.2017		
5		Ag. Mgr	TAZARA-TR	17/7/2017		
6		PE-CU	TAZARA TR	17/7/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS

MINISTRY OF HEALTH

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		Engineer	MOHCD&EC	26/07/2017		
2		VALUER	MOHCD&EC	26/07/2017		
3		ARCHITECT	MOHCD&EC	26/07/2017		
4		ENGINEER	MOHCD&EC	26/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
MINISTRY OF LAND, HOUSING AND HUMAN SETTLEMENT

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		MAP	ICAA MC	13/7/2017		
2		HABER	MLHHSB	13/7/17		
3		ADM.P	MLHHSB	13/7/2017		
4		E ADDR	MLHHSB	13/7/2017		
5		DRTIP	MLHHSB	13/7/2017		
6		ADDE	-11-	13/07/2017		
7		Ag ADDR	-11-	13/07/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
MINISTRY OF WATER AND IRRIGATION + DAWASA

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1.		Ag. HODU	MoWI	19/07/17		
2.		CDO-EMU	MoWI	19/07/17		
3.		Engineer	MoWI	19/7/2017		
4.		Tech.	MoWI	19/7/2017		
5.		Engineer	MoWI	19/7/2017		
6.		Engineer	MoWI	19/7/2017		
7.		ENGINEER	MoWI	19/07/2017		
8.		Scannist	MoWI	19/07/2017		
9.		Environmentalist	MoWI	19/7/2017		
10.		Environmentalist	DAWASA	19/7/2017		
11.		Engineer	UDSM	19/7/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
DAR-ES-SALAAM CITY COUNCIL

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
3		SENIOR URBAN PLANNER	DCC	13 <sup>th</sup> July 2017		
4		SENIOR SURVEYING ENGINEER	DCC	20 July 2017		
5		PRINCIPAL SURVEYOR (ASCP)	DCC	20 July 2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN

LIST OF STAKEHOLDERS  
SUMATRA

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
02		RLMO	Sumatra	24/7/2017		
03		RSD	SUMATRA	24/07/2017		

STRATEGIC ENVIRONMENTAL ASSESMENT FOR DAR ES SALAAM URBAN

TRANSPORT MASTER PLAN

ATTENDANCE LIST  
PAYMENT VOUCHER  
KINUBI - 23.11.2017

S/N	NAME OF PARTICIPANTS	TITLE	AMOUNT PHONE NO.	SIGNATURE
1.		M/KITISI/M		
2.		KATINY WED		
3		AFISA M/MNTI		
4		AFISA ARDHI		
5.		AFISA MAZINGIRA		
6		M/KITI BARAZA		
7		M/KITI		
8		M/KITI MATA		
9		AFISA MIFUGO		
10		KATIBU WA BARAZA		
11		POLISI KINUBI		
12.		M/ BARAZA		
13.		AFISA ASIA		
14		M/KITI		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT  
 MASTER PLAN  
 LIST OF STAKEHOLDERS

S/N	NAME	TITLE	INSTITUTION	DATE	PHONE NO.	SIGNATURE
1		CHIEF OF TRAFFIC	POLICE	24/11/2017		
2		Co-Legal Officer	IRF-TRAFFIC	24/11/2017		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR  
 REVISION OF DAR SALAAM URBAN TRANSPORT MASTER PLAN  
 UNITED REPUBLIC OF TANZANIA  
 STAKEHOLDER SIGNATURE FORM

S/N	NAME	INSTITUTION	POSITION	CONTRACT	SIGNATURE	DATE
1			DINAWI			28/12/2017
2		BUNGU	MUO			28/12/2017
3		BUNGU	MWENYEKI			28/12/2017
4		BUNGU	MW/KITI			28/12/2017
5						28/12/2017
6			Mw/Kiti			28/12/2017
7						

STAKEHOLDER'S SIGNATURE FORM

S/N	NAME	INSTITUTION	POSITION	CONTACT	SIGNATURE	DATE
1		KMC	M/KITI MBEZI BEACH B			19/12/2017
2		KMC	WEO			19/12/2017
3		KMC	M/KITI MBEZI BEACH			19/12/2017
4		KMC	M/BASIBYANK			19/12/2017
5		KMC	MEO			19/12/2017
6			M/KITI MBEZI			19/12/2017
7		KMC	ETHO			19/12/2017

S/N	NAME	INSTITUTION	POSITION	CONTACT	SIGNATURE	DATE
1		NJENI	MEO			20/12/2017
2		MABWEPANDE WARD	WEO			22/12/2017
3		MABWEPANDE WARD	CDO			22/12/2017
4		MABWEPANDE WARD	MEO			22/12/2017
5		M/PANDE WARD	M/KIT			22/12/2017
6		M/PANDE	M/UCR			22/12/2017
7		M/PANDE	ETHO			22/12/2017
8		M/PANDE	M/KITI			22/12/2017
9		M/PANDE	MEO			22/12/2017
10		MABWEPANDE	MEO			22/12/2017
11		MABWEPANDE	MEO			22/12/2017
12		MABWEPANDE	FIELD			22/12/2017
13		MABWEPANDE	SECRETARI			22/12/2017



**PRESIDENT'S OFFICE – REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**  
**MUNICIPAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR UPDATING OF THE**  
**DAR ES SALAAM TRANSPORT MASTER PLAN**

**REGISTRATON FORM- 15 JAN 2018**

S/N	NAME	ORGANISATION	POSITION	CONTACT	SIGNATURE	E-MAIL
1		UBUNGU	MUPO			
2		TEMERE	AG MWE			
3		KINONDONI	TP O/C			
4		KINONDONI	TPD			
5		TEMERE	REALISILI			
6		Ubungu Mungu	MEMO			
7		ILALA	MEMO			
9		KINONDONI	AG-MWE			
10		UBUNGU	AG MWE			
11		TEMERE	EMO			
12		KINONDONI	E CO			
13						

**PRESIDENT'S OFFICE – REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**  
**MUNICIPAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR UPDATING OF THE**  
**DAR ES SALAAM TRANSPORT MASTER PLAN**

**REGISTRATON FORM- 15 JAN 2018**

S/N	NAME	ORGANISATION	POSITION	CONTACT	SIGNATURE	E-MAIL
1		UBUNGU MC	LAND OFFICER			
2		UBUNGU MC	AG MCD			
3		KMC	AG MCD			
4		IMC	AG MCBO			
5		KMC	MEMO			
6		KMC	ICTO			
7		IME	INPSD			
9		KMC	AFISAMITH			
10		KMC	AFISA ARDH			
11		TEMERE MC	AG MCD			
12		KMC	EMO			
13						



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
AND LOCAL GOVERNMENT

NATIONAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)  
FOR UPDATING DAR ES SALAAM URBAN TRANSPORT MASTER PLAN  
CONDUCTED BY INSTITUTE OF RESOURCE ASSESSMENT OF UNIVERSITY OF DAR ES SALAAM  
UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		BAGAMUSO	DEREVA			
2		KISARAWI	DRIVER			
3		KIGAMENI	DRIVER			
4		Dsm Sisi	DRIVER			
5		UBUNGU MARIKA	DRIVER			
6		MKURANGA	DEREVA			
7		KIGAMENI	DRIVER			



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
✓ 1		KISARAWI-DC	DED			
* 2		PO-RALG	STPO			
✓ 3		TMC	EMU			
✓ 4		TMC	IMP/SD			
* 5		PO-RALG	TPO			
6		Dsm	DRV			
7		HALA MC	DRV			



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		PO-RALG	AG DICT			
2		MNRT	PROCP)			
3		NEMO	PEMO			
4		KICUMBI M.C	MD			
5		RAS-PWANI	Rep. RAS			
6		DART	TP			
7		UDOM	Participant			



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1						
2		12 CHANGERS OF COMMERCIAL INDUSTRY & AGRIC	DIRECTOR FOR AGRIC & RURAL DEVELOPMENT			
3		ARDH UNIVERSITY	Lecturer			
4		Ubungu Municipal Gov	Environment and other matters			
5		TAFIROADS	Head of Safety & Environment			
6		ILAZA M.C	Head of Dept Env & SWM			
7		BAGAMOTO DC	DED			
8		PO-RALG	L/O			
9		-/-	GIS			



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		PO-RALG	SLS			
2		UMC	TPO			
3		PO - RALG	PLANNING			
4		PO-RALG	SQST			
5		PO-RALG	Engineer			
6		PO-RALG	TPO			
7		Mkuranga DC	DED			



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		RS DST7	AAS Infra			
2		JICA Study Team	Environmental & Social Considerations			
3		"	Asst. Eng			
4		"	Deputy Team Leader Urban Planning			
5		UBUNGO MC	MD-UBUNGO MC			
6		PO-RALG	ICTO			
7		CHALINZE DC	DED			



DARTMP – JICA  
The Project for Revision of DSM Urban Transport Master Plan  
(DARTMP)



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
AND LOCAL GOVERNMENT

NATIONAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)  
FOR UPDATING DAR ES SALAAM URBAN TRANSPORT MASTER PLAN  
CONDUCTED BY INSTITUTE OF RESOURCE ASSESSMENT OF UNIVERSITY OF DAR ES SALAAM  
UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		DSM CC.	CD			
2		VPO	PEBE			
3						
4						



DARTMP – JICA  
The Project for Revision of DSM Urban Transport Master Plan  
(DARTMP)



PRESIDENT'S OFFICE - REGIONAL ADMINISTRATION  
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NATIONAL WORKSHOP ON STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)  
FOR UPDATING DAR ES SALAAM URBAN TRANSPORT MASTER PLAN  
CONDUCTED BY INSTITUTE OF RESOURCE ASSESSMENT OF UNIVERSITY OF DAR ES SALAAM  
UNDER THE COMMISSION OF JICA STUDYTEAM

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		RPHCO	SIGNAL AND TELECOMM ENGINEER			
2						
3						
4						

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVIEW OF DAR ES SALAAM TRANSPORT MASTER PLAN

STAKEHOLDER'S ATTENDANCE LIST						
S/N	NAME/JINA	TITLE/CHEO	INSTITUTION /TAASISI	DATE /TAREHE	PHONE NO./SIMU	SIGNATURES AHIHI
1		AFISA MAINDIGI	TAA	27/04/2018		
2		Mhandisi	TAA	27/04/18		
3		ANSA WENDISHAJI	TAA	27-04-18		
4		MHANDISI	TAA	27/04/18		
5		COMPLIANCE OFF	TAA	27/04/18		
6		Manager PDE	TAA	27/04/18		
7		Ag. PIC	TAA JNIA	27/4/18		

STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE REVISION OF DAR ES SALAAM URBAN TRANSPORT MASTER PLAN (DUTMP)

NO	NAME	POSITION	CONTACT	EMAIL	SIGNATURE	DATE
1.		SENIOR MANAGING OFFICER				30 April 2018
2.		Jourism Nemco ATB DE Municipal Commissioner				30 April 2018
3.		TAWUA Dir				30/4/2018

PRESIDENT'S OFFICE – REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR UPDATING OF THE  
DAR ES SALAAM TRANSPORT MASTER PLAN

REGISTRATON FORM- MAY, 2018

S/N	NAME	ORGANISATION	POSITION	CONTACT	EMAIL	SIGNATURE
1		TPA	Director of Engineering Services			
2		TPA - DIP	Civil Engineer			
3						
4						
5						