

DEVELOPMENT OF SUSTAINABLE PUBLIC TRANSPORT SYSTEM IN DAR ES SALAAM CITY

PRESENTED AT
URBAN ENVIRONMENT – AFRICAN CARBON FORUM 2017
COTONOU, BENIN
28- 30 JUNE 2017



Ir Fanuel O.S. Kalugendo
Transport Planning Engineer

Bringing Bus Rapid Transit to Tanzania



OUTLINE

1. Dar es Salam City Profile
2. Modes of Transport
3. Urban Transport Challenges
4. Mass Transit Options
5. Development of BRT in Dar es Salaam
6. DART Technology
7. Demonstrable benefits
8. Challenges & Lessons Learnt
9. Upscaling



DAR ES SALAM CITY PROFILE



Socio-Economic Indicators in Tanzania

	2000	2004	2005
Population (million persons)	34.8	37.6	38.3
Population Growth Rate (%)	2.1	1.9	1.8
GNI (billion US\$)	8.9	11.7	12.7
Per Capita GNI(US\$)	280	320	340
GDP (billion US\$)	8.1	11.3	12.1
GDP Growth Rate (%)	5.1	6.7	7.0

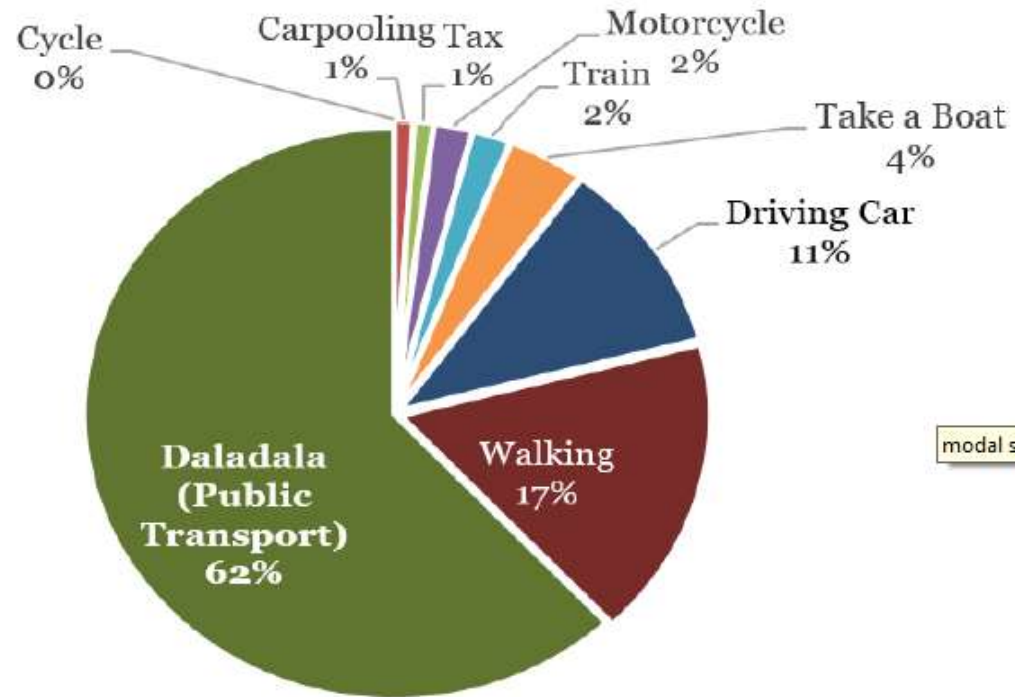
Industrial Structure	Primary	Secondary	Tertiary
GDP Composition (%) in 2004	44.8	16.7	38.5
Employees in 2002	80%	20%	
Unemployment Rate in 2002		30%	

- The commercial city of Tanzania,
- Generates about 80% of government's domestic revenue.
- The city's population is estimated to be over 5 million and expected to be a mega city with more than 10 million by 2030.
- Fastest growth of Vehicle ownership is 19% /per annum (2002-2015)
- City population (2012) is estimated to be 4.5 millions,
- Yearly growth rate of 7.7% (2012 Census)

MODES OF TRANSPORT

- Average Annual Vehicular Growth is around 20% per annum (2002-2015)
- Modes of Transport
 - Daladala
 - Bajaji
 - Bodaboda
 - Private Car

Modal split in 2014, Dar Es Salaam



URBAN TRANSPORT CHALLENGES

**Rapid Growth
of
Population**

**Insufficient
Infrastructure**

**Expansion of
Urban Areas**

**Emission from
Vehicles**



**Congestion
and traffic
jams**

**Inadequate
Traffic
Management**

**Low Capacity
Buses**

**Air quality
and Health
issues**

MASS TRANSIT OPTIONS

Bus Rapid Transit



Light Rail Transit



Underground metro



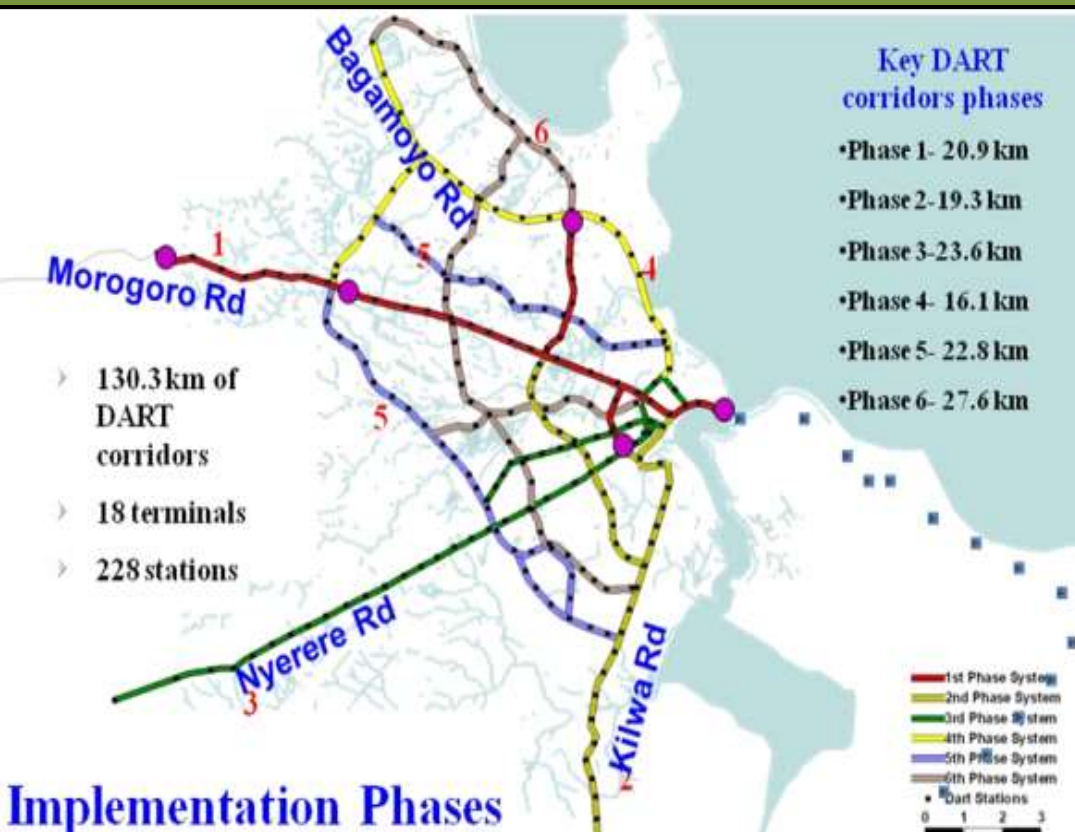
Urban rail



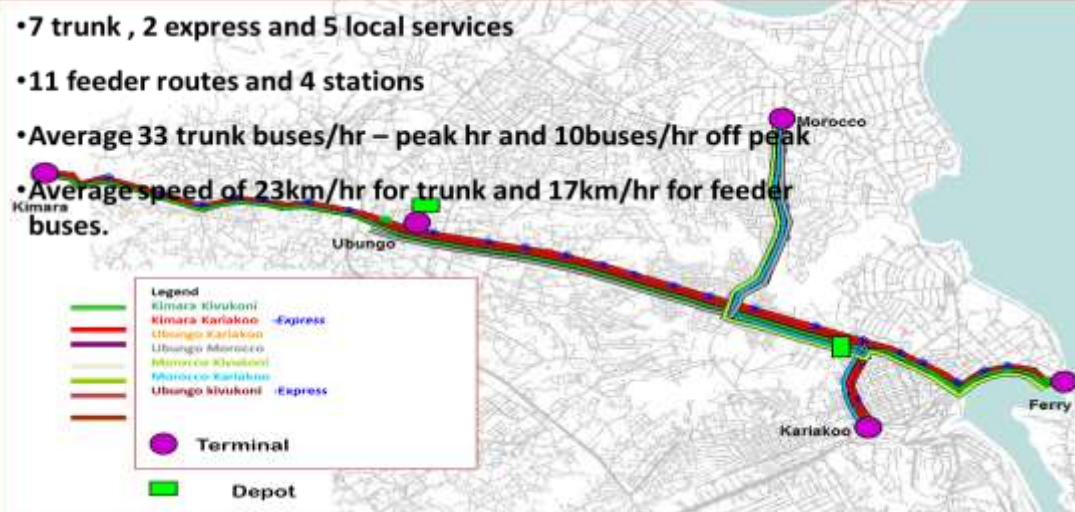
- i. Rail Base System ✗
 - High Cost and Operational Challenges
 - Too Big to Fail

- ii. Improved Bus System ✓
 - Low Cost
 - Low Operational Risk
 - Availability of Affordable Technology and Encourage Participation of Local Entrepreneurs

5.DEVELOPMENT OF BRT IN DAR ES SALAAM



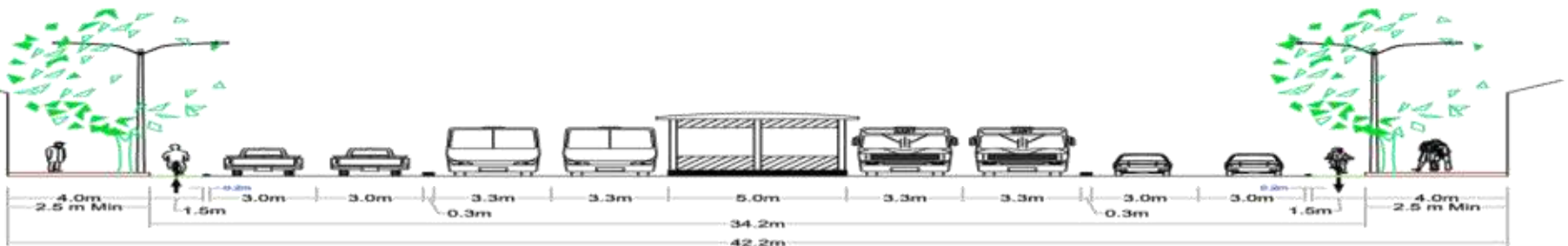
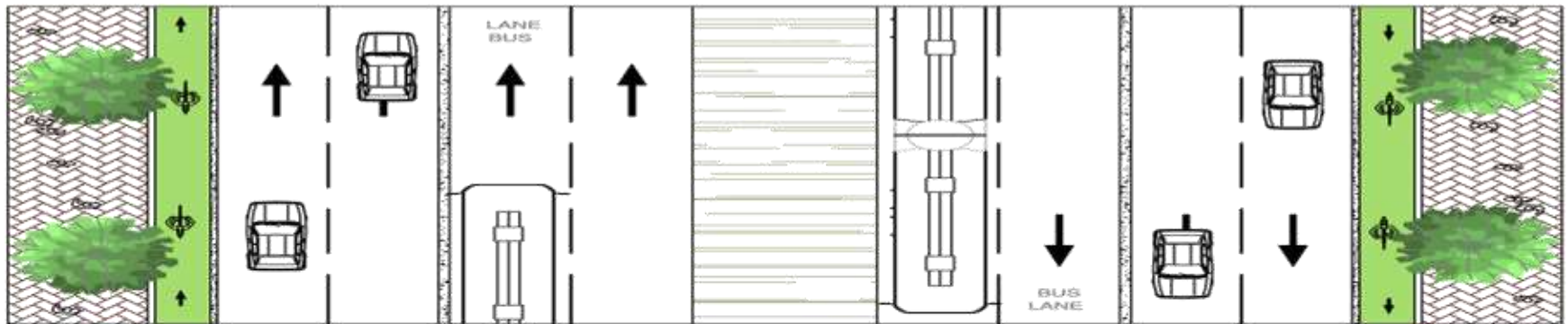
Implementation Phases



- Concept was Visualized in 2002
- Detailed Study was completed 2005-2007.
- 6 Corridors Selected
- DART Agency established 2007.
- BRT infrastructure Phase I - 2007
- Phase 1- Completed on 2015.
- Bus operations started on ay 2016.

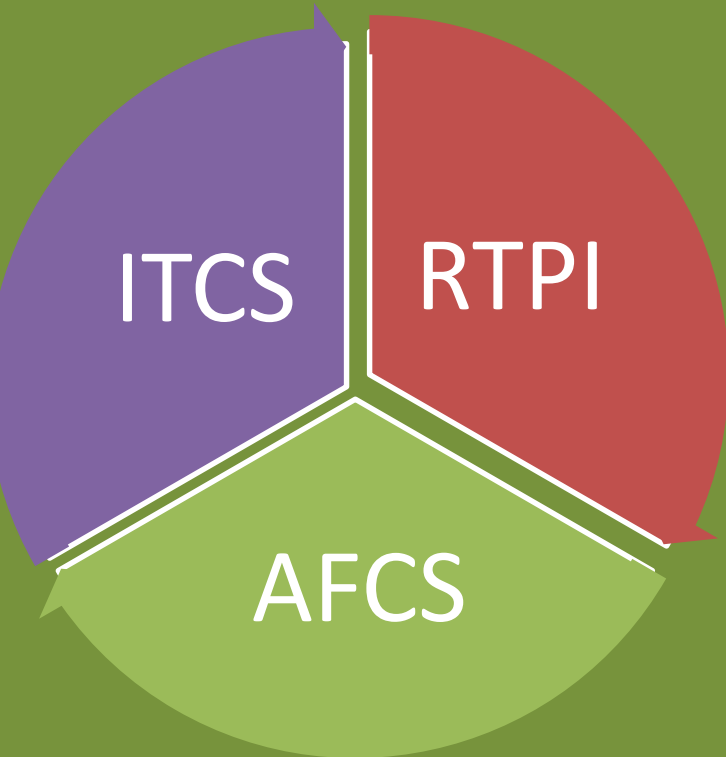
MAIN BRT CHARACTERISTICS

- **Fully dedicated right of way (busway)**
- **Alignment in the center of the road** (to avoid typical curb-side delays)
- **Stations with off-board fare collection** (to reduce boarding and alighting delay related to paying the driver)
- **Station platforms level with the bus floor** (to reduce boarding and alighting delay caused by steps)
- **Redesigned intersections** (to avoid intersection signal delay)



DART ITS TECHNOLOGY

One Single Software Platform



ITS -Systems Capability

Real Time Visibility

and Tracking of buses

1. automatic vehicle location
2. Various view, selection and search options
3. Monitoring of the performed services (status, deviations, etc.)

Daily Planning

1. Route Planning
2. Bus Scheduling

Operations

Optimization as and when required

Stations

- Displayed in digital screens at stations
- Announcements

On board

- Digital displays
- Announcements

Control Center

- Automatic Vehicle Location
- Various view, selection and search options
- Monitoring of the performed services (status, deviations, etc.)

BUS TECHNOLOGY



- **DART Buses: General Specification – Trunk (18 m) and Feeder (12m)**
 - Emission Class Euro III technology
 - Real mountable engine
 - Propulsion Fuel – diesel
 - Automatic gearbox-hydraulic retarder
 - Total pneumatic suspension
 - Pneumatic brake system
 - Fuel reserve of 300ltres
 - Minimum power of 260HP

**IMPROVED ACCESSIBILITY AND
MOBILITY**

**ECO-FRIENDLY
TRANSPORTATION:
* EMISSION REDUCTION**

**KEY BENEFITS OF THE
DART SYSTEM**

**CONVENIENT AND SAFE
PUBLIC TRANSPORT**

**EFFICIENT USE OF
URBAN SPACE**

DART EMISSION REDUCTION

BRT six potential impacts on emission:

- Induced modal shift to BRT from more emission-intensive modes
- Increased fuel efficiency due to increase in mixed traffic speeds
- Reduced transit VKT due to rationalized routes
- Increased fuel efficiency of buses due to improved transit vehicle speed
- Improved bus fuel efficiency of new buses and the scrapage of old buses
- Decreased auto trips due to the development of transit-supportive land uses and decreased household motorization rates.

CHALLENGES

- 1. DART System is new to Tanzania**
 - New to key stakeholders including the public, the private sector investor and the Government.
- 2. Resettlement Action Plan (RAP)-Cancellation of some works, Court cases**
- 3. Construction contracts- Quality of designs, Unmapped utilities.**

LESSONS LEARNT - PHASE 1

- 1. Procurement of Service Providers should commence early.**
- 2. Resettlement Action Plan be implemented and completed before start of construction.**
- 3. Build capacity of both public and private sectors.**

UP SCALING DART SYSTEM – Next stage

PHASE 3

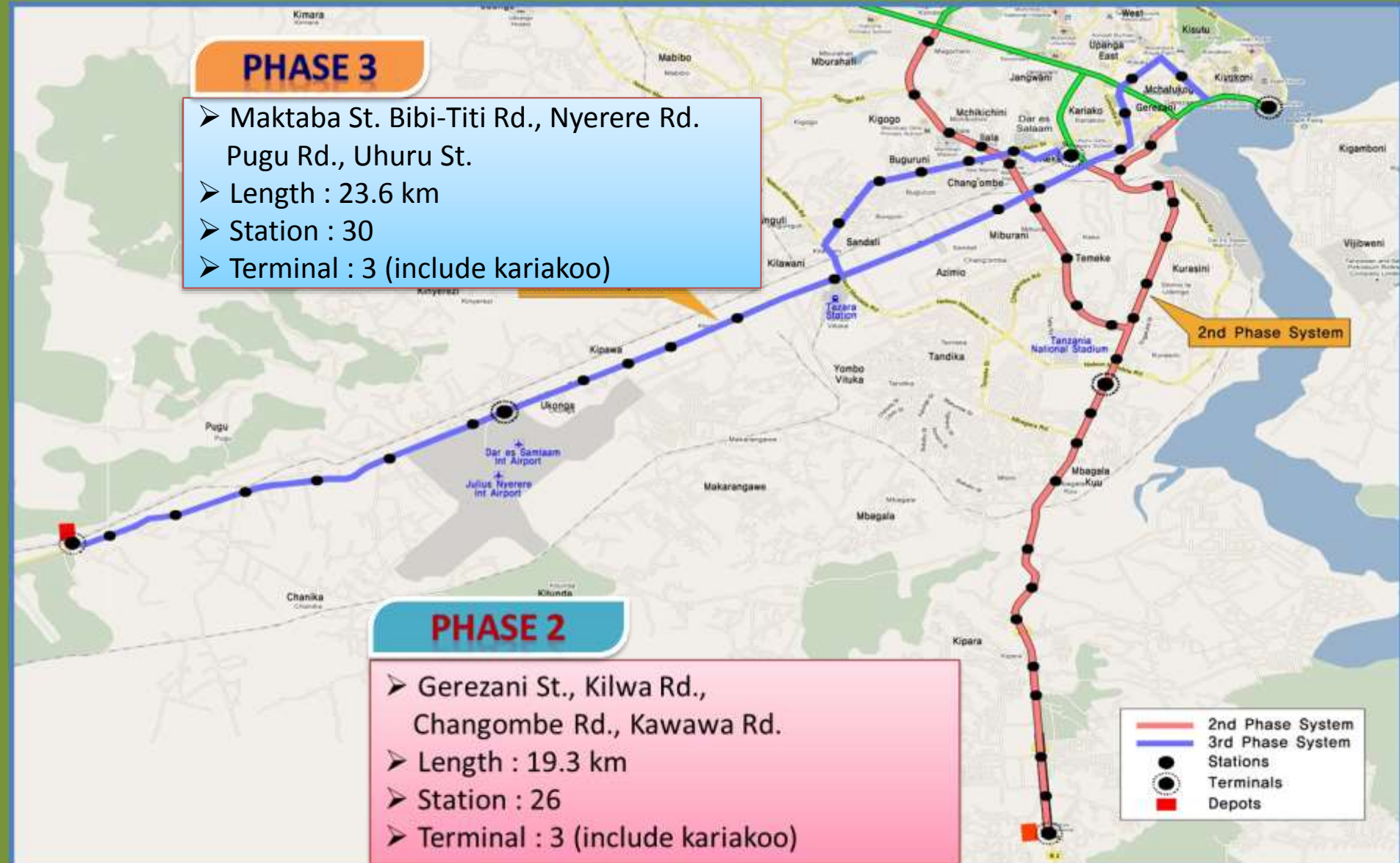
- Maktaba St. Bibi-Titi Rd., Nyerere Rd. Pugu Rd., Uhuru St.
- Length : 23.6 km
- Station : 30
- Terminal : 3 (include kariakoo)

PHASE 2

- Gerezani St., Kilwa Rd., Changombe Rd., Kawawa Rd.
- Length : 19.3 km
- Station : 26
- Terminal : 3 (include kariakoo)

- 2nd Phase System
- 3rd Phase System
- Stations
- Terminals
- Depots

2nd Phase System



Thank You

