Chapter 5 Public Transport Sector

5.1 Transport Balance in the Life of the City

There is a high dependence on public transport and also walking is a major mobility function across communities in Dar es Salaam. It follows accordingly that, in order to improve the quality of life of its citizens, the city's development must cater in a large way for these two modes of transport.

A major risk or a challenge to the city is the explosion in private car ownership and use generated by incomes increases. A large-scale rise in car use demands heavily on public resources to cater for the necessary infrastructure such as roads, but, a demand frequently proven to be beyond the capacity. Furthermore, increased pollution, congestion, wide traffic thoroughfares and the imposition of cars on walking and living spaces will develop an undesirable living environment.

Dar es Salaam has the opportunity to avoid many pitfalls encountered by other developed cities and the initiative already taken to prioritize public transport through the BRT system, which is a major positive step in defining a balanced city. This balance involves applying the right priorities between personal mobility (walking, NMT, cars); the essential movement of goods and freight (port and service vehicles); and an orderly planned public transport system (BRT and associated bus networks). Ultimately, the city is best served if it can create livable communities through a sustainable transport system that enhances and empowers its communities.

5.2 Sustainable Frameworks for Public Transport in Dar es Salaam

Transport management failures in Dar es Salaam are mostly due to:

- Poor policy frameworks;
- Gaps in responsibility (where responsibility is vague and ill-defined);
- Responsibilities are duplicated or fragmented under a number of agencies also leading to uncertainty in resources and who provides them;
- Emphasis on regulation instead of management; and
- Lack of coordination and integration across sectors and between levels of government.

Addressing these failures requires attention to four main areas of transport management and delivery including (1) Policy and Organization, (2) System Management which place an emphasis on 'management' and not just 'regulation', and the remaining two areas of (3) network efficiency and (4) operator business models which relate to service delivery.

5.2.1 Policy and Organization

There needs to be a clear understanding on the role and function of the various organizations in managing passenger transport. And particularly, there needs to be an understanding of the difference in 'regulating' and 'managing'.

The Government is requested to set a strategic vision for the urban transport system through its transport policy, and this vision needs to be translated into strategic policy instruments by an Authority that has the power to oversee and coordinate it. The development of a Dar es Salaam Urban Transport Authority (DUTA) is proposed in this regard (further detailed discussion is available in Chapter 7).

In the context of a passenger transport network, a strategic policy sets guidelines for:

- Network coverage and accessibility;
- Broad service parameters (fare policy, service frequency, passenger comfort standards, safety standards);
- System specifications and system branding;
- Planning for future services including service and system expansion.

The Authority (DUTA) will delegate the implementation of these polices to the system managers (DART) and monitor overall system performance. It will also develop urban transport development policy & plans that support transport integration across all sectors.

5.2.2 System Management and Funding Arrangements

The system manager for public transport in Dar es Salaam will be the DART Agency. Guided by the strategic policy set by the Authority, DART will develop tactical policy to manage the business of public transport in the most effective and efficient way and take a commercial and business-like approach to maximize revenue and to minimize costs within the framework of strategic policy.

The key performance measures for DART include quality indicators of service delivery as well as financial performance achieved through customer satisfaction/revenue growth and managed costs.

DART contracts the operation of the buses through a performance-based contract to bus operators who perform services according to the requirements as specified in the contract. As DART has total responsibility for the performance of the business, it monitors and enforces the conditions of the contract. Accordingly much of SUMATRA's present regulatory role over the public transport service delivery in Dar es Salaam is thus taken over by DART.

System funding and fare levels

The present arrangements show a haphazard and coincidental method of funding bus operations with fare levels set through regulation or competition and having no connection to the real cost of providing services.

Funding needs to be rearranged so that revenues accrue to the network and not to the operator (separating the operator costs from network revenue). This will improve integration, allowing fares to be 'network based', and have the operator paid to deliver services to the network. Under such a regime, the system manager would collect revenue (through an integrated ticketing system) and pay operators for services provided to the network. This proposed system funding model is shown as **Figure 5.2.1** showing how government takes responsibility for the funding decisions (i.e. level of fares & service vs. subsidy level.).

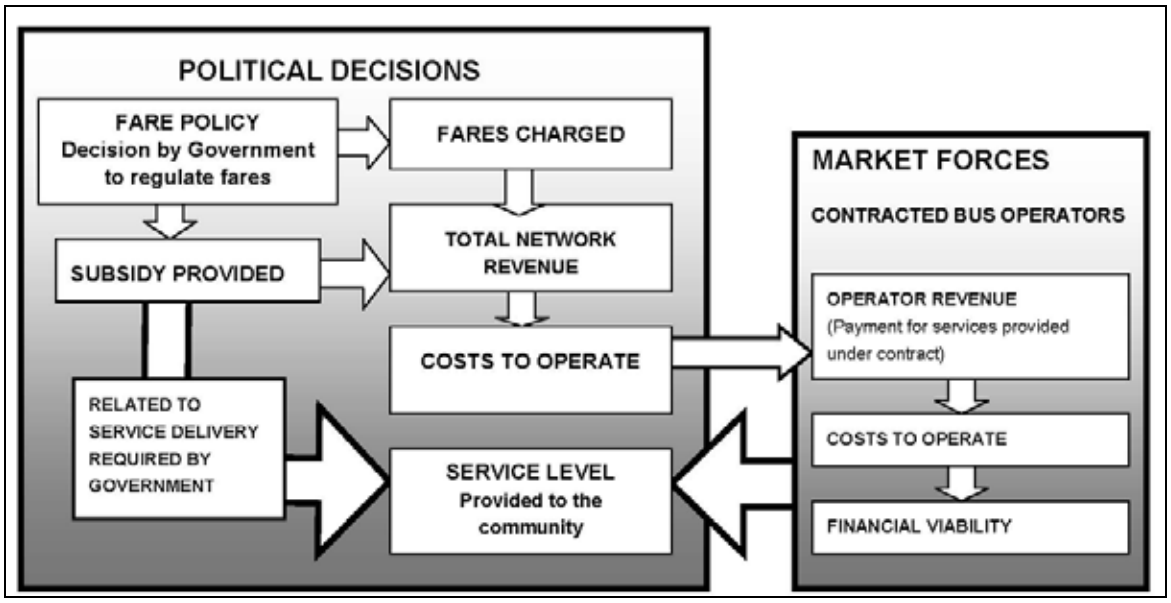


Figure 5.2.1 Separating System Revenue and Operator Revenue

Such a funding model will:

- Increase overall revenues to meet the full cost of operation to proper quality levels as well as creating conditions for long term investment;
- Build a system network through fare integration and common ticketing so that passengers are not penalized for transfers to other services;
- Pay operators for service delivery to the network rather than competing on a route by route basis;
- Allows for cross subsidy between lucrative and loss making routes;
- Give options to deliver subsidies more carefully to selected users, but available to all such groups across the system.

Subsidy funding

Avoiding subsidies is a good objective, but to succeed, requires careful strategy based on realistic principles:

- The bus operator must operate under a financially viable and profitable business model. An efficient quality service does not occur through starving the operator;
- More efficiency means less subsidy, and the government must take an active role in network development to create system efficiencies;
- Creating ridership is a key objective for responsible system planners;
- Government investment into bus infrastructure to improve efficiency and service quality will reduce subsidy (through increasing average bus operating speeds);
- Furthermore, reduce travel time boosts ridership leading to a 'lower cost/ higher revenue' path to efficiency and subsidy elimination.

The system manager takes a commercial and business-like approach to developing sufficient system revenues to cover the cost of operation (being the contract km costs, management and administration costs and marketing costs) and to do this within the overall constraint of providing affordable fares.

If the government wishes to maintain fare levels at 'social' level below the commercial level, then the government would allocate a subsidy to make up the revenue shortfall. The incentive is then for the system manager to build revenue and reduce dependence on subsidy – this being a key performance indicator for the system manager's performance. Should revenue fall or costs rise, the system manager has the choice of reducing services, increasing fares or use other market driven alternatives such as promotional fares, or improving operating efficiencies. These decisions can be considered along the lines of commercial business practice and government priorities.

5.2.3 Network Planning and Efficiency

Dar es Salaam is well progressed to developing a 'state of the art' BRT system but it is necessary to place this into a proper and objective planning context. BRT is not a 'cure-all' and its success is dependent on where it sits in the overall public transport of Dar es Salaam and whether it meets the essential criterion necessary for success. All successful public transport systems need to include the following:

- Demand oriented services;
- Bus priority (including BRT where appropriate) giving :
  - Increased bus speeds;
  - Reduced travel time;

- Access and integration;

- Efficient Network design.

Demand-oriented services

Under traditional public ownership, buses were mostly 'supply oriented' – building the system on technical or regulatory premises on the assumption that patronage will follow. More recently, transport planners have understood that consumers have greater choice, so for public transport to survive demands a 'demand responsive' approach.

For the transit user, the transit experience is more than just a bus trip; it is a total journey (from door to door) and judged in terms of access, convenience, travel time and comfort. Network design should take this into account and involve all aspects of route planning, passenger waiting facilities, ticketing, bus quality, service frequency, comfort and convenience in the planning process.

For a 'demand oriented system', passenger convenience is the main issue, being that the system can be used with ease and ultimately saves the user time.

This concept needs to be embedded into policy objectives and the design and management of the system including features such as:

- Good network design;
- Convenient bus transfer facilities;
- Common ticketing and fare integration;
- Reduced travel time (bus speed & passenger transfer facilities);
- Passenger information;
- Modal integration; and
- Quality (sometimes futuristic) design.

Bus priority

There are numerous forms of bus priority that are relevant and applicable in various conditions, but success is only achieved through developing a system that can perform to the required standard (efficient speed and service delivery) and where management structures assign risk and accountability prudently and traveler's needs are met terms of reliability, safety and convenience. In most cases planners must find contextual solutions to finely balance multiple and competing objectives without interfering with the essential objectives of BRT that must be met to ensure its success.

Increasing bus speeds

Traffic congestion has a severe and detrimental impact on the viability of bus services. Maintaining good average speeds for buses is an essential improvement to ensure a productive bus fleet and reduced

commute times for passengers. Measures to improve bus-operating speeds have many benefits, as described in **Figure 5.2.2**.

The direct revenue /cost benefits for the operator are:

- Faster travel speeds attract more passengers thereby generating extra patronage (and therefore) revenues;
- Revenue per bus (per day/per km.) is boosted as the number of passengers per hour is increased. This has the effect of increasing bus system capacity and productivity;
- Costs are reduced as the number of buses required to maintain headways is reduced along with the associated personnel costs, running costs and vehicle overhead costs (saving the number of extra buses that are used to replace buses held up in traffic).

There are also longer term benefits gained for the city:

- Increasing bus revenues will stimulate investment in bus technology (better quality buses and cleaner emissions) resulting in passengers benefits of comfort and convenience;
- A better bus system will result in offering better public transport as an option of choice;
- Energy and environmental benefits are also realized by more people using an efficient transport option.

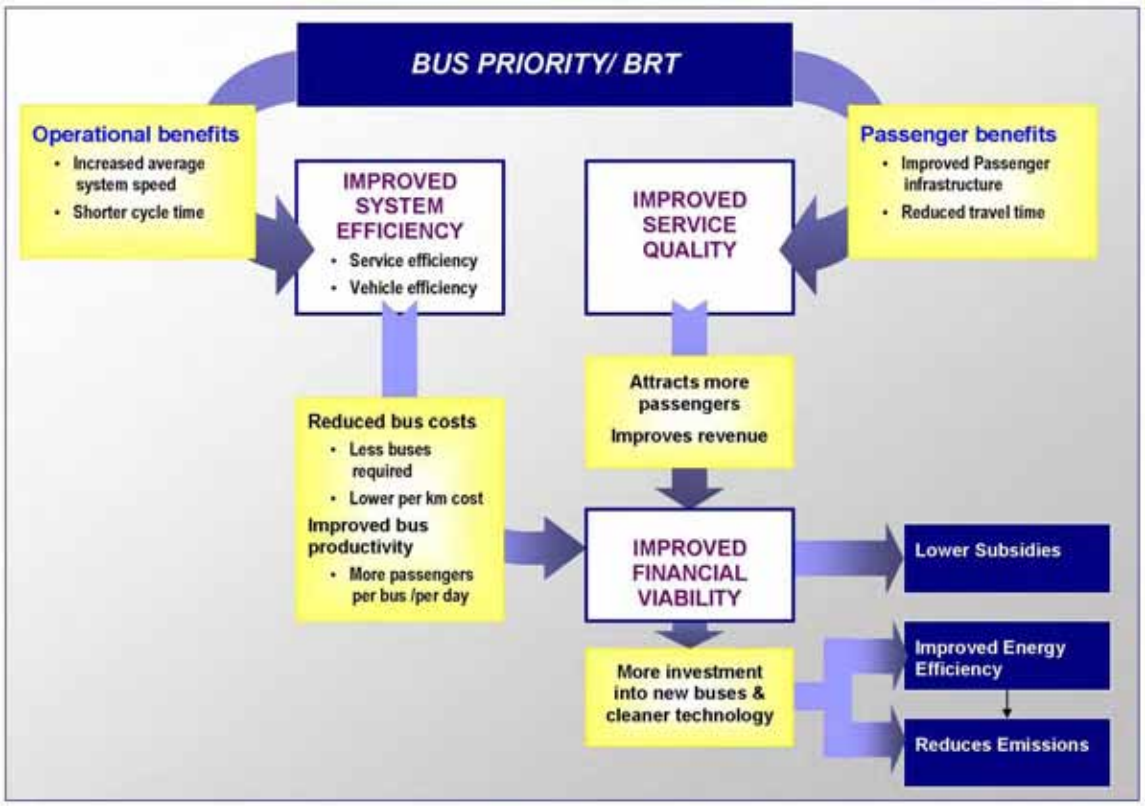


Figure 5.2.2 Benefits of increasing bus speeds

Each city must develop its own strategic approach for Bus Priority and BRT as part of the total system network. BRT is not an 'off the shelf' bus solution; it needs to be carefully adapted to the prevailing conditions, but in Dar es Salaam, high public transport dependency creates a natural opportunity for a BRT system.

Reducing travel time

For the bus system to provide efficient mobility to the community and be an attractive option, requires that it has the ability to provide time savings. Traffic congestion may be an unavoidable fact of life (unless car restrictive policies are applied), so bus systems must provide a time saving transit alternative.

Increasing bus speeds is part of this, but also involves proper design of passenger infrastructure (bus stops, bus stations, information systems, etc). Good walking access will significantly reduce the total journey time, which for the passenger is a key comparison to car use.

Passengers often perceive waiting/delay time as higher than the actual time taken, so this is a significant deterrent to bus travel.

Better passenger infrastructure is needed, including:

- High profile bus stop areas that are attractive and provide comfortable amenities;
- Real time passenger information systems that provide information on bus arrival times and service delays;
- Designs and amenities that address personal safety considerations (telephones, lighting footpaths, safety barriers and access ways);
- Easy-to-use fare collection systems and integrated (common) ticketing;

Well located designs that consider 'ease of transfer' between services.

Accessibility and integration

Accessibility involves route and network design but also involves aspects of physical and system integration. Accessibility can be defined in two ways, being firstly the level of access to the system (ease of access to bus services and affordability) and secondly, once on the system, whether the destination can easily be reached.

Improving accessibility therefore requires:

- Good network design – bus services routed close to homes and dwellings & destinations;
- Physical infrastructure - requiring 'people friendly' designs for bus stops and waiting areas, with convenient transfer points and bus interchanges to provide 'seamless' transfers (ticketing equipment, safe pedestrian walkways, and passenger amenities). It is also a good idea to provide more interchange points throughout the network and have less dependence on large

and bust bus interchanges (i.e. being able to transfer at bus stops).

- Appropriate and affordable fare structure and ticketing systems;
- Integration - being the extent to which the various types of service are part of the whole public transport network.

The provision of system infrastructure including passenger information systems (integrated fare systems, timetables and real-time passenger information).

Route Network design

The actual design of routes is an important aspect of accessibility but must also be designed so that the system is easy to understand and use. Route design is a careful balance between creating direct travel options (point to point) and developing system efficiencies to ensure that bus hours are optimally used. Therefore, the network must be easy to use, provide direct travel for the high use corridors, and provide easy transfers for lesser used travel options. Provided bus transfers incur no extra cost and are easy to negotiate; they should not act as a disincentive to system use.

The design principles of a new route network involve the following:

- Intuitive and easy to understand
  - Simple network design (BRT as the spine system and secondary & local feeder routes)
  - Orderly and intuitive route numbering system
  - Reduce the number of routes and duplications;
- Network Integration
  - Physical (managed interfaces)
  - System (distance – based fare integration/ no penalty for transfers)
- Accessibility & coverage
  - Can I access the system and then once on it reach my destination easily?
  - Access to main attractors (distributors for inner city circle routes);
- Demand oriented design
  - High demand routes direct
  - Lesser demand easy transfer
- Fleet efficiency
  - Implement bus priority to increase bus speed and reliability.

Integrated fares and common ticketing

From a passenger viewpoint, having a distance-based, unified fare across the network offers ease of use and a cost saving. This ‘common ticket’ is based on zonal fare structure where the passenger pays only for the distance traveled. In effect this means that a user pays an ‘entry’ fee to the system and can use the system on any number of services to complete the journey.

Modern ticketing systems can accommodate complex fare configurations and adapt to various requirements. It provides significant user benefits for convenience and ease of use, and it also provides essential ridership data for revenue control and system planning. With the planned BRT system, the secondary and feeder buses can be fitted with ticket machines to allow free transfers within the system onto the BRT and vice versa.

5.2.4 BRT Operator Frameworks and Business Model

Primarily the success of the service delivery performed by the operator is highly dependant on the risk assigned between the network (system) manager and the individual operator[1]. Risk exposure will influences operator behavior and the incentives created by a proper business model will ensure the operators perform in the interest of the network and not just their own survival.

5.3 Bus Route Network Development

The bus route network for Dar es Salaam is largely dictated by the route design of the BRT with Phase 1 BRT being the 'spine' of the service in the initial stages. A supporting bus route network is essential to support the BRT system, as well as provide services across the wider city and urban areas.

5.3.1 Planning Principles for Route Design

Route design is fundamental to meeting passenger needs, as its efficiency influences ridership (revenue) and manage costs efficiently. The three main planning objectives are to:

1. Create a network that will satisfy existing and future travel demand in terms of coverage and accessibility and reduces travel time;
2. Design a network that is easy for the passenger to understand and use, with a clear route hierarchy that has:
    - Primary trunk routes of BRT, the secondary bus network and feeder routes;
    - A clear origin-destination pattern (directness to main attractors) and easy transfer points to reduce the number of routes and duplications;
3. Ensure that the network is efficient in terms of fleet utilization and can offer the flexibility to adjust services to meet demand while maintaining high load factors.

These objectives require a network plan which can maintain a balance between providing a high level of direct service for high demand routes and for lesser demand journeys offer convenient passenger transfer points. Integrated ticketing across all services means that passengers are not penalized for changing buses to complete a journey.

[1] Technical Report 3 outlines a full discussion on the operator business model and the institutional frameworks to cover service delivery.

Specifically the route network must deliver:

- Strong origin- destination pattern connecting major and popular destinations;
- Proper spacing between bus routes and less route duplications;
- Suitable bus transfer points to provide connectivity with other modes;
- Use of a route numbering system that is orderly, directional and geographical;
- Determine suitability of service for road geometry and bus priority along high use corridors.

5.3.2 Integration and Development of a Bus Network

Bus route network development must enable the integration of the BRT system into a complete network to provide seamless travel and network benefits for passengers across the system.

'System integration' involves both physical integration, where services blend together to offer seamless travel across the network and system integration being the use of integrated fares to ensure passengers are not penalized when transferring across services. While integration has good passenger benefits, it also can improve the financial viability of the network by attracting passengers and increasing ridership and revenue.

As mentioned previously, the proposed BRT plan has a high dependency on feeder routes and under a typical feeder bus system passengers will need to transfer to BRT by alighting at a feeder bus terminus, and cross the road to the median BRT station. There are numerous locations in Dar es Salaam, where literally thousands of passengers per hour will 'feed' into BRT stations requiring a well organized feeder terminal, and also a way of transferring these passengers to the BRT via overhead walkway or signalized pedestrian crossings.

To address this important interface issue, it is proposed to develop a network of secondary routes that can improve integration. While these are also effectively feeders to the BRT, they will also provide a higher degree of cross suburb travel options and be fully fare-integrated to the BRT.

Better integration and a solution to the interface issues is designating selected secondary buses as 'complementary BRT buses' that are permitted to enter the BRT busway for short distances. These would operate as fare integrated secondary routes in mixed traffic and by means of an extra set of doors (at station platform height) alight passengers directly on to the station platform (on the paid side) for a direct connection to BRT trunk services. This alleviates the walking transfer and reduces the need for bus /Dala Dala interchange facilities.

There is also the possibility of the complementary buses being used for off-peak services on the BRT as a more efficient means of transporting off-peak loads while maintaining a higher level of service frequency. The BRT complementary bus routes offer an advantage in that it extends the reach of BRT influence and catchment into a much wider area. Some level of bus priority should be provided for these services (queue jumping lanes at lights and green light priority are suggested). Good quality

designated bus stops are also a highly visible demonstration of service quality and availability throughout the extended suburbs.

Another benefit is that complementary buses can operate a greater distance on the BRT busway if necessary, such as off- peak services, providing a more efficient option for low demand periods (by using smaller buses) thereby greatly increasing the flexibility of the system.

The efficiency and serviceability of the service design options are compared in the Decision Matrix of **Table 5.3.1**. This matrix assesses the service quality and the various levels of integration offered by each option starting with Option 1 as the existing proposed trunk/feeder system, comparing it to Option 2 being a general route network integrated to a BRT and the final and recommended Option 3 of the complementary routes fully integrated into the BRT. The matrix assesses each scenario over a range of service quality issues, demonstrating a pronounced advantage for the integration offered by a complementary bus service.

Table 5.3.1 Decision Matrix

Service Type Options - Decision Matrix							
		Service Quality Criteria					
Option S/No.	Service Combination	Level of coverage	Level of Network Integration	Ease of passenger transfer	Level of fare integration across the network	Level of cross suburb service for passengers	Level of additional service flexibility
1	**BRT Trunk lines with Feeder Routes**	**Medium Low**	**Low**	**Medium**	**Low**	**Low**	**Nil**
	BRT has dedicated feeder routes - Cross suburb regular bus connection incidental ***(Existing Dar es Salaam Plan)***	Only within 5km of BRT	Feeder bus routes free or are partially subsidised to offer fare relief for transfers. Regular routes are not integrated	Passengers walk from curbside feeder buses to BRT stations	Only feeder routes are fare integrated	Requires interchange to other feeder buses	BRT and Feeders are two distinct and separate services
2	**BRT Trunk lines connected to regular bus routes and feeders**	**High**	**High**	**Medium**	**High**	**Medium High**	**Nil**
	Regular buses are part of the feeder network with fare integration	Provides full network coverage of regular bus services that connect to BRT	Provides adequate network benefits but needs to be fully 'fare integrated'	Passengers must walk from curbsides to BRT stations	High when fares integrated **Low** when not integrated	Time penalty for bus transfers to other feeder services or regular bus network	BRT buses and network/ feeder buses are distinct and separate services
3	**BRT Trunk lines with complementary routes and feeder routes**	**Very High**	**Very High**	**Very High**	**High**	**Very High**	**High**
	Complementary Bus priority routes are physically integrated by having RHS doors for transfers to BRT and fares are fully integrated	The secondary routes extend a higher level of benefits across a wider network	Total integration in physical terms as well total fare integration	Platform transfers on the 'paid side' of the BRT platform is a 'seamless' transfer	Total integration across the entire network	Fully integrated with cross suburb routes provides a complete matrix of area coverage	Complementary buses are 'BRT compatible' and can be used on the BRT network at off peak times for greater fleet efficiency and cost savings.

5.3.3 Route Network Design Principles for Dar es Salaam

A complete bus network for the study area involving five phases of BRT introduction up to Year 2017 is prepared. At each phase of implementation routes are added and in some cases secondary routes are replaced by BRT trunk routes. The following section describes the logic behind the implementation as well as the description of routes and implementation constraints.

(1) Types of service

The bus network design identifies different 'service types' as follows:

BRT trunk line: Buses that operate exclusively on the BRT (15 metre or 18m articulated buses).

BRT complementary buses: 12m or 15m buses that operate along regular bus routes (that also may have some measures of bus priority treatments) but can also enter the BRT busway and service the station platforms. These buses will have 2 doors on the left-hand side for curbside pickup and 2 right-hand doors for station access.

Secondary buses: 12 m city buses that operate regular bus routes (but do not enter the BRT busway). These routes also service areas other than busway connections.

Feeder services: being the smaller buses (30 seats or less that provide short feeder services to the BRT).

(2) Passenger demand

The route design is substantially based on the existing demand figures that have informed the route design, identifying which services require direct connection and where a transfer is feasible. It is surmised that the present system of Dala Dala and viphanyas operate more or less to demand (as they respond to patronage demand in high volume routes) and this then provide an indication where demand lies. However a logical approach is also used to connect known attractors with origins to reduce the need for the forced passenger transfers caused presently where Dala Dala operate strictly between termini. The new plan focuses on a high level of accessibility and connectivity in the system.

(3) Accessibility and connectivity

The route design has followed high demand routes, to ensure a large proportion of travelers are able to make a more or less direct trip with minimal transfer necessary. However for lesser demand trips the network gives an option for passengers to transfer at many points where routes connect (not just at terminal stations) so it offers the benefits of a true network. For the Phase 1 BRT there have been numerous interchange points identified where the secondary and complementary buses touch the system as shown in **Figure 5.3.1**.

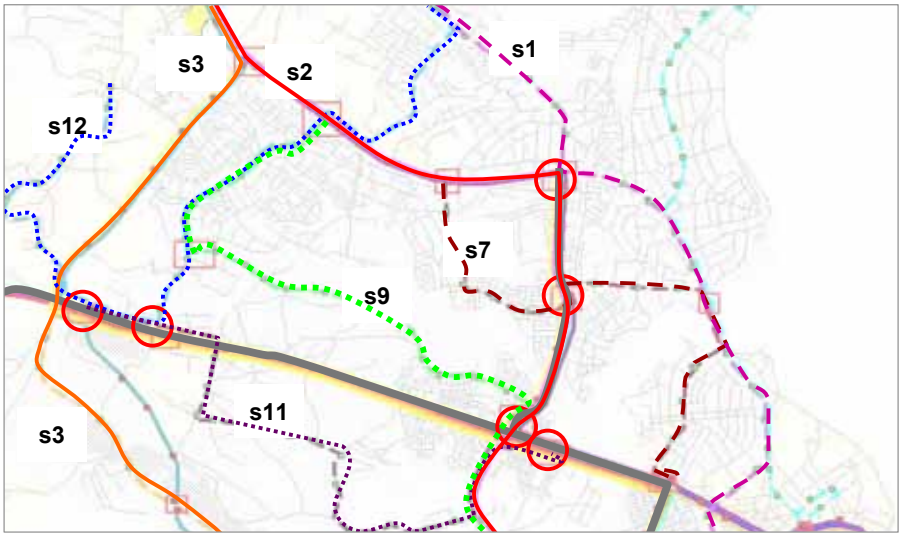


Figure 5.3.1 Major Interchange Points with Phase 1 for Secondary Routes

(4) BRT route numbering system

Passengers will quickly become accustomed to the route system where the route numbering system is intuitively associated with area and corridors. For the BRT routes only, the logic is a three digit number where the first number denotes area serviced (origin) the second number being the main corridor traversed and the destination is denoted by the third number. The list of numbers and some examples are outlined in **Figure 5.3.2** with **Figure** 5.3.3 showing Phase 1 examples.

The secondary routes at this point are just given an alpha numeric label (*S1, S2* etc) for the sake of simplicity. Where these routes are modified during network development they may be allotted a suffix (e.g. 'm' for modified or 'ext' for extension).

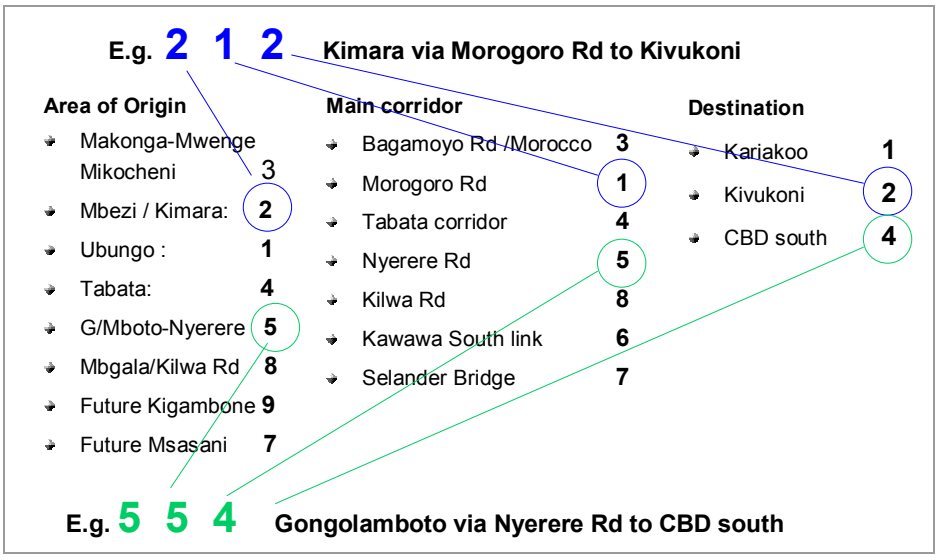


Figure 5.3.2 Explanation of route numbers for BRT routes

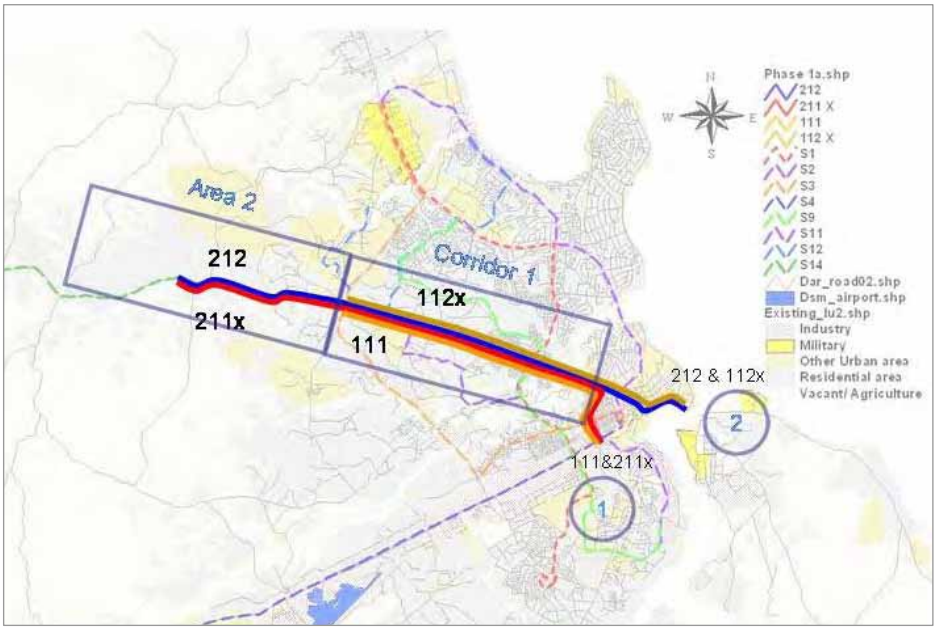


Figure 5.3.3 Examples of route numbers for Phase 1 BRT

A complete route design (2015) is shown as **Figure 5.3.4** and a 2030 route design is shown as **Figure 5.3.5**.

5.3.4 Phased Introduction of Bus Routes

The bus route network development will follow the order of phased BRT development. These phases are reliant on road construction and in some cases require flyovers to ease the intersection and traffic conflict issue.

With the high proportion of bus travel in Dar es Salaam, the early development of an efficient bus system is critical to improving the commuting experience and the quality of daily life. The payoffs in financial, economic, social terms will more than justify an accelerated investment into the public transport infrastructure. Consequently the full plan (to Phase 5) is proposed to occur by year 2017.

Following the completion of *Phase 1*, the sequence of BRT system expansion for future phases depends largely on the corridors being prepared, namely:

1. Having available space within the road reserve. The only proposed corridor with available space presently is Nyerere Rd (as at 2007) but the Gongolamboto section will need road construction.
2. Completing road widening projects according to the anticipated timetable as follows:
   - Sam Nujome Rd – 2008.
   - Kilwa Rd – 2009.
   - New Bagamoyo Rd – 2011.

BRT and Secondary Bus Route Plan by 2015

BRT	Route No.	Route	Length (km)
	112X	Ubungo to Kivukoni Express	10.8
	211X	Kimara to Kariakoo Express	14.5
	212	Kimara to Kivukoni	16.0
	248	Kimara to Tandika via Tabata line	19.0
	311	Mwenge to Kariakoo via Sam Nujome & Ubungo	13.4
	331	Morocco to Kariakoo	7.3
	332Ext	Mwenge to Kivukoni via Bagamoyo Rd & Morocco	13.0
	344	Makongo - Mwenge - Ubungo - Tabata to CBD (Tabata Rail Corridor)	20.0
	500	Airport - Mtoni via Nyerere Rd & Mbagala Rd	12.5
	554	Gongolamboto via Nyerere Rd to Karaikoo	16.0
	881/2/4	Mtoni to Kariakoo via Kilwa Rd / Mbgala to Kivukoni via Kilwa Rd / Kongowe to CBD via Kilwa Rd	11.0/16.0/18.0
		Total Operation Length (BRT)	187.5

Secondary	Route No.	Route	Length (km)
	S1	Kawe - Mikocheni -Msasani to Tandika via Bagamoyo Rd, Kawawe Rd Changombe	20.5
	S2	Makonga to Kariakoo via Bagamoyo Rd, Ali Hussein Rd, Bibi Titi	20.0
	S3M	Ubungo to CBD via Mandela Rd - Uhuru Rd, Bugurundi	14.7
	S5	Masani Peninsula to CBD via Selander Br. to Mirambo St loop.	12.3
	S7	Mwananyamala-Kinindoni to Upanga Fire Station via Selander Br. & United Nations Rd	8.1
	S8	Tandika -Temeke to Kariakoo via Mandela Rd & Uhuru Rd Buguruni	12.3
	S9	Tandale to Port via Kawawa Link & Changombe	17.5
	S10	Kiwalani to Kariakoo via Nyerere & Uhuru St Buguruni	8.7
	S11	Ubungo - Mabibo to Magomeni Mapipa	9.5
	S12	Mikocheni - Kijitonyama- Ubungo - University Ubungo Chokuu	13.7
	S13	Boko to Makongo	21.3
	S14	Mbezi To Kimara	10.0
	S21	Msasani to Port via Bibi Titi Rd, Kariakoo and Bandari Rd	16.0
	S22	Tandika to Kariakoo via Shandrimoya Rd	12.2
	S85	Mandela Rd (ot Mbagala Rd), Nyerere Rd, Kilwa Rd, Temeke Loop	16.5
		Total Operation Length (Secondary Bus)	213.3

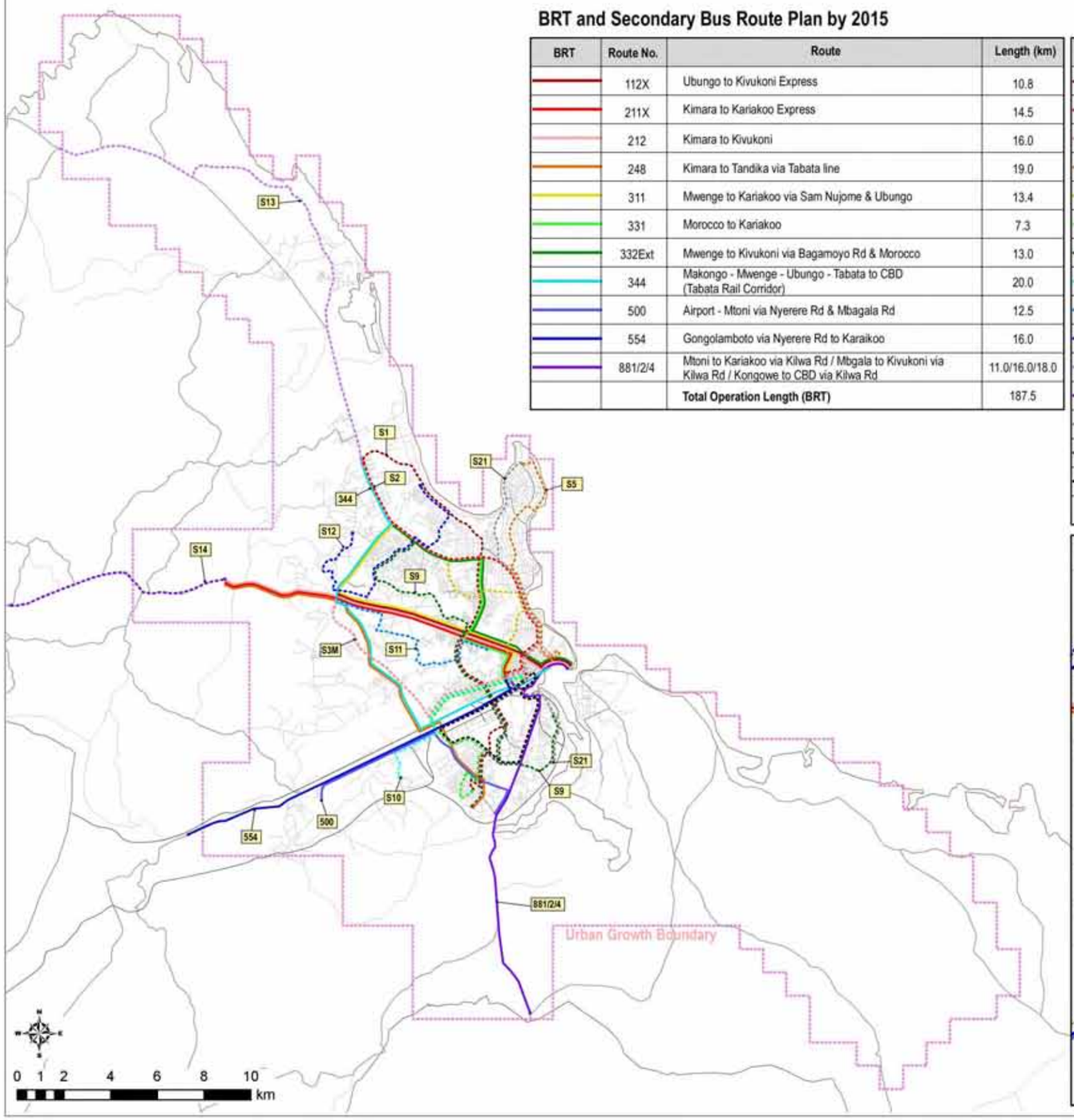


Figure 5.3.4 BRT and Secondary bus route plan by 2015

BRT and Secondary Bus Route Plan by 2030

BRT	Route No.	Route	Length (km)
	112X	Ubungo to Kivukoni Express	10.8
	211X	Kimara to Kariakoo Express	14.5
	212	Kimara to Kivukoni	16.0
	248	Kimara to Tandika via Tabata line	19.0
	311	Mwenge to Kariakoo via Sam Nujome & Ubungo	13.4
	331	Morocco to Kariakoo	7.3
	332Ext	Mwenge to Kivukoni via Bagamoyo Rd & Morocco	13.0
	333	Northern Boko extension	18.2
	344	Makongo - Mwenge - Ubungo - Tabata to CBD (Tabata Rail Corridor)	20.0
	500	Airport - Mtoni via Nyerere Rd & Mbagala Rd	12.5
	554	Gongolamboto via Nyerere Rd to Karaikoo	16.0
	600	Kigamboni to Ubungo via Vijibweni Bridge and Tabata	30.0
	644	Southern extension to CBD via Tazara and Buguruni	33.4
	684	Southern extension to CBD via Kilwa Rd	28.4
	854	Tandika to Kariakoo via Tazara	8.5
	881/2/4	Mtoni to Kariakoo via Kilwa Rd / Mbgala to Kivukoni via Kilwa Rd / Kongowe to CBD via Kilwa Rd	11.0/16.0/18.0
	991	South Kigamboni to Kariakoo	14.5
	994	Kigamboni to CBD	18.6
		Total Operation Length (BRT)	339.1

Secondary	Route No.	Route	Length (km)
	S1	Kawe - Mikocheni -Msasani to Tandika via Bagamoyo Rd, Kawawe Rd Changombe	20.5
	S2M	Mwenge to Kariakoo via Bagamoyo Rd, Ali Hussein Rd, Bibi Titi	17.0
	S3M	Ubungo to CBD via Mandela Rd - Uhuru Rd, Bugurundi	14.7
	S5	Masani Peninsula to CBD via Selander Br. to Mirambo St loop.	12.3
	S7	Mwananyamala-Kinindoni to Upanga Fire Station via Selander Br. & United Nations Rd	8.1
	S8	Tandika -Temeke to Kariakoo via Mandela Rd & Uhuru Rd Buguruni	12.3
	S9	Tandale to Port via Kawawa Link & Changombe	17.5
	S10	Kiwalani to Kariakoo via Nyerere & Uhuru St Buguruni	8.7
	S11	Ubungo - Mabibo to Magomeni Mapipa	9.5
	S12	Mikocheni - Kijitonyama- Ubungo - University Ubungo Chokuu	13.7
	S13M	Northern Route via Bunji	17.9
	S14	Mbezi To Kimara	10.0
	S15	Southern coastal route to Kigamboni	25.0
	S16	Southern inland route	14.6
	S21	Msasani to Port via Bibi Titi Rd, Kariakoo and Bandari Rd	16.0
	S22	Tandika to Kariakoo via Shandrimoya Rd	12.2
	S85	Mandela Rd (ot Mbagala Rd), Nyerere Rd, Kilwa Rd, Temeke Loop	16.5
		Total Operation Length (Secondary Bus)	246.5

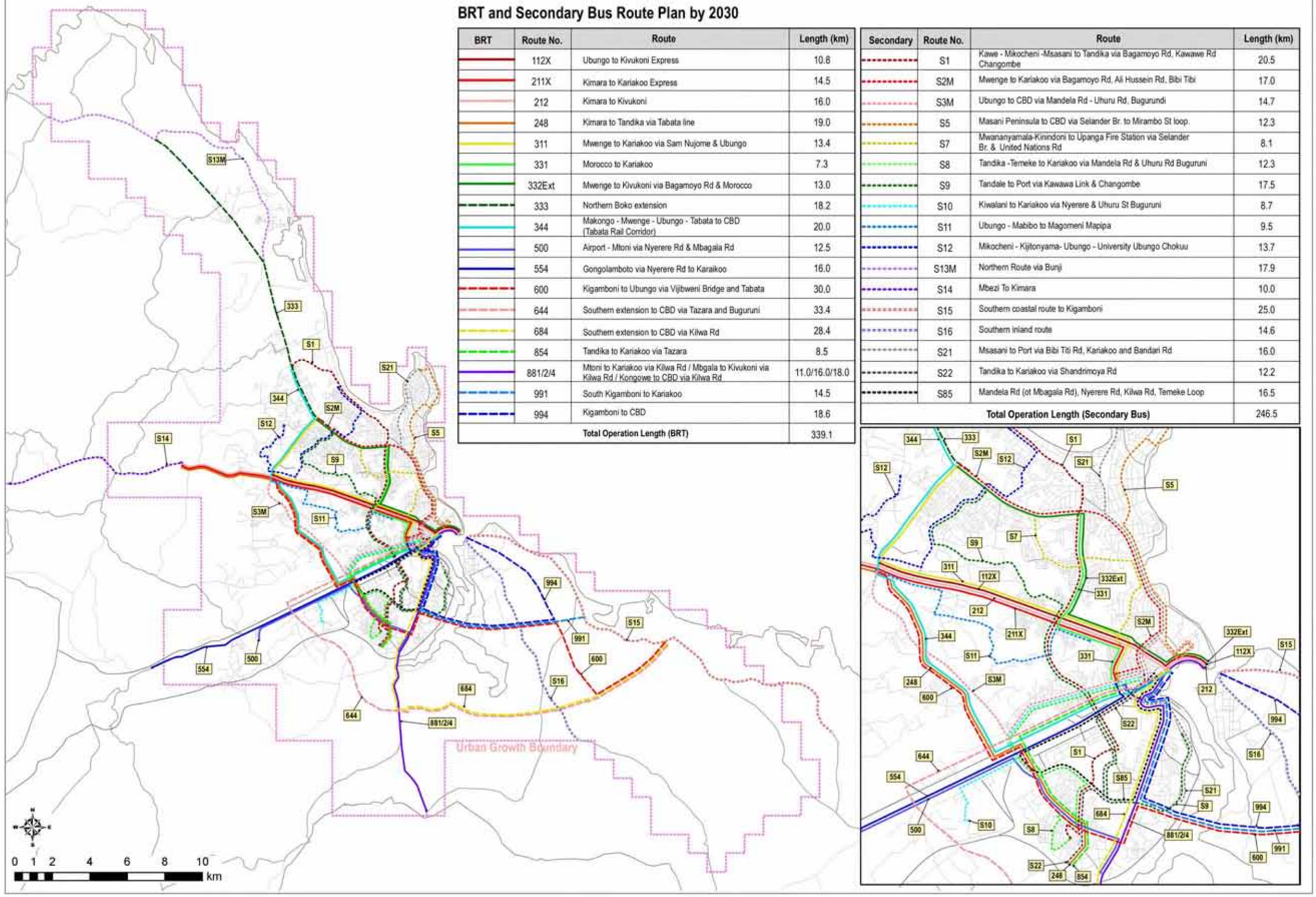


Figure 5.3.5 BRT and Secondary bus route plan by 2030

3. Securing corridor availability, specifically the Ubungo – Tabata disused rail corridor to the CBD which has been proposed by the study team for a 'changed-use' scenario to utilize it for a BRT route. This corridor is presently under a TRL concession requiring negotiation for its use. The timescale for this decision is unknown, but with some political will to improve public transport in the western suburbs it may be possible to expect a resolution during 2008- 2009. If this occurred it would allow a relatively early introduction.

A number of flyover infrastructures need to be developed as part of the BRT busways, namely the BRT flyovers crossing Kariakoo/ Nyerere Rd intersection, Mandela Rd (at Tabata and at Buguruni), and others.

Based on the estimated road construction timetable and availability scenarios, the phases of BRT introduction are estimated according to **Table 5.3.2**.

Table 5.3.2 BRT Development Program

Section	Road space availability	BRT introduction
Phase 1 Morogoro road	2007 (Committed project)	2010
Phase 2 Nyerere road	2007 (Available corridor)	2012
Phase 3A Kilwa road	Road widening will complete in 2009; requires elevated BRT to CBD (This phase can be phase 2)	2012/2013
Phase 3B TRL corridor	2009 (subject to negotiation with TRL)	2014
Phase 4A Sam Nujome Rd Phase 4B Bagomoyo Rd	2011 (Completed roadwork)	2015
Phase 5	Requires a bridge to be constructed to Vibijweni / Kigamboni - extension of Nelson Mandela Rd	2015-2020

Source: JICA Study Team

(1) BRT Phase 1: Morogoro Rd to Kivukoni & Kariakoo

Phase 1 Corridor Description

This is the inaugural BRT trunk corridor along Morogoro Rd operating from Kimara to Kivukoni and branching to Kariakoo. Land resumption is underway (2007/2008) and assuming a 12 + month build-period the completion is expected late 2009. The Morocco section operates from Magomeni Mapipa along Kawawa Rd North.

Phase 1 Route Operation

Table 5.3.3 lists the proposed routes for Phase 1 and includes 7 trunk routes and 10 secondary routes.

Table 5.3.3 List of Phase 1 Routes

Phase 1	Morogoro Rd & Kariakoo		km
New	212	Kimara to Kivukoni	16.0
New	211X	Kimara to Kariakoo Express	14.5
New	111	Ubungo to Kariakoo	9.3
New	112X	Ubungo to Kivukoni Express	10.8
New	300	Morocco to Ubungo	9.4
New	332	Morocco to Kivukoni	8.7
New	331	Morocco to Kariakoo	7.3
New	S1	Kawe - Mikocheni -Msasani to Tandika via Bagamoyo Rd, Kawawe Rd Changombe	20.5
New	S2	Makonga to Port via Bagamoyo Rd, Ali Hussein Rd, Bibi Tibi /Kariakoo	20.0
New	S3	Makongo - Mwenge - Ubungo - Buguruni via Mandela Rd & Uhuru St Buguruni	23.0
New	S4	Gongolamboto via Nyerere Rd to Kariakoo	16.0
New	S9	Tandale to Port via Kawawa Link & Changombe	17.5
New	S10	Kiwalani to Kariakoo via Nyerere & Uhuru St Buguruni	8.7
New	S11	Ubungo - Mabibo to Magomeni Mapipa	9.5
New	S12	Mikocheni - Kijitonyama- Ubungo - University Ubungo Chokuu	13.7
New	S14	Mbezi To Kimara	10.0
New	S20	Kimara to Tandika via Mandela Rd /Changombe Rd	19.0
New	S21	Msasani to Port via Bibi Titi Rd, Kariakoo and Bandari Rd	16.0

Source: JICA Study Team

(2) BRT Phase 2: Gongolamboto & Nyerere Rd.

Phase 2 Corridor Description

Phase 2 is the construction of BRT along Nyerere Rd from Gongolamboto to the CBD, terminating at Kariakoo interchange where it connects with other routes.

Phase 2 Route Operation

The BRT routes for *Phase 2* will initially comprise an all-stops service (554) to Kariakoo replacing the S4 secondary route (See **Table 5.3.4**). Five additional secondary routes are added in this phase:

Table 5.3.4 List of Phase 2 Routes

Phase 2	Gongolamboto & Nyerere Rd		km
New	554	Gongolamboto via Nyerere Rd to Karaikoo	16.0
Remove	S4	Replaced by BRT Route 554	
New	S5	Masani Peninsula to CBD via Selander Br. to Mirambo St loop.	12.3
New	S6	Airport - Mtoni via Nyerere Rd & Mbagala Rd	12.5
New	S7	Mwananyamala-Kinondoni to Upanga Fire Station via Selander Br. & United Nations Rd	8.1
New	S8	Tandika -Temeke to Kariakoo via Mandela Rd & Uhuru Rd Buguruni	12.3
New	S22	Tandika to Kariakoo via Shandrimoya Rd	12.2

Source: JICA Study Team

(3) BRT Phase 3A: Kilwa Rd and 3B Tabata Rail Corridor/ Mbgala Rd Link

Phase 3 is a major construction phase as it builds the Kilwa Rd BRT and includes the Gerezani redevelopment connecting the southern Kilwa Rd corridor direct to the CBD. The Gerezani options include the widening of Bandari Rd to include BRT. The Ubungo-Tabata line includes the redevelopment of the Railway St Station and building a busway along the disused portion of the Tabata rail corridor. The final portion of Phase 3B is the construction of a BRT busway along Mbagala Rd and a short section to Tandika. This completes the connection between Nyerere Rd and Kilwa Rd Mtoni. These phases are combined because they can be constructed more or less simultaneously and includes the Mbagala link with the Tabata corridor development because it synchronizes the route development making implementation of bus service changes smoother and more coherent.

Phase 3A Corridor Description

Phase 3A is the implementation of BRT from Mbagala along Kilwa Rd. There is a major issue in connecting this corridor the CBD and the Kariakoo Interchange.

Phase 3A Route Operation

Under the Phase 3A introduction 3 routes will operate to the CBD, as shown **Table 5.3.5.** Some of these longer routes could operate as a limited stop express to improve efficiency (e.g. the 884 from Kongowe could operate as a non-stop between Mtoni and the CBD with passengers for intermediate stop transferring to the all-stops service at Mtoni).

Table 5.3.5 List of Phase 3A Routes

Phase 3A	Kilwa Rd		km
New	881	Mtoni to Kariakoo via Kilwa Rd	11.0
New	882	Mbgala to Kivukoni via Kilwa Rd	16.0
New	884	Kongowe to CBD via Kilwa Rd	18.0

Source: JICA Study Team

Phase 3B Route Operation

The new *Phase 3B* routes are listed in **Table 5.3.6**.

Route 144 is the main service from Ubungo (interchange with Morogoro Rd services) to Kariakoo (BRT station on south side of interchange) and then travelling to the CBD (interchange with Kilwa Rd service). While this route appears to be a duplicate Route 554 along Nyerere Rd for a section, this is not the case, as the rail line separates access from Nyerere Rd.

Route 248 replaces secondary route S20 travelling via the Morogoro Rd busway to the Tabata busway and the Mbagala Rd busway to Tandika. This becomes an important cross suburb connection supporting a high travel demand. Two major BRT intersection transfer points are offered being Nyerere Rd, Tabata Line at Buguruni and the Ubungo terminus.

Route 500 replaces secondary route S6 redirecting buses from Nelson Mandela Rd to the Mbagala BRT link travelling to Tandika. An additional secondary route (S85) will be implemented as a 2-way loop service operating along Mandela Rd , Nyerere Rd, Kilwa Rd, and Temeke. Alternatively this route can operate as a BRT complementary bus using Mbagala Rd, Nyerere Rd Tabata line and Kilwa Rd using the busways for the entire loop.

Table 5.3.6 List of Phase 3B Routes

Phase 3B	Ubungo -Tabata Rail Corridor & Mbagala Rd Tandika Link		km
New	500	Airport - Mtoni via Nyerere Rd & Mbagala Rd	12.5
New	144	Ubungo - Tabata to CBD (Rail Corridor)	13.2
New	248	Kimara to Tandika via Tabata line	19.0
Remove	S6	Replaced by 500	
Remove	s20	Replaced by 284	
New	S85	Mandela Rd (ot Mbagala Rd), Nyerere Rd, Kilwa Rd, Temeke Loop	16.5

Source: JICA Study Team

(4) BRT Phase 4: 4A Sam Nujome and 4B Bagamoyo Rd to Makongo

Phase 4 includes a major north western BRT initiative covering Sam Nujome Rd and Bagamoyo Rd.

Phase 4 Corridor Description

Phase 4A is the Sam Nujome Rd section extending the BRT from Ubungo to Mwenge.

Phase 4B comprises the extension of BRT from Morocco terminal to Mwenge and through to Makongo /Kawe.

Phase 4 Route Operation

The new routes and route modifications for Phase 4 are listed in **Table 5.3.7**.

Table 5.3.7 List of Phase 4 Routes

Phase 4	Sam Nujome, Bagamoyo Rd Section and Kawawa Link		km
Extend 111 to Mwenge	311	Mwenge to Kariakoo via Sam Nujome & Ubungo	13.4
Extend to Mwenge	332 Ext	Mwenge to Kivukoni via Bagamoyo Rd & Morocco	13.0
Extension to Makongo	344	Makongo - Mwenge - Ubungo - Tabata to CBD (Tabata Rail Corridor)	20.0
	S3	Replaced by S3 - M and BRT route 344 extension	
Shorten	S3-M	Ubungo to CBD via Mandela Rd - Uhuru Rd, Bugurundi	14.7
New	S13	Boko to Makongo	21.3

Source: JICA Study Team

(5) BRT Phase 5: Kigamboni Extension

Phase 5 Corridor Description

The construction over a bridge over the Port channel at Kurasini from Nelson Mandela Rd will enable a Phase 5 BRT extension to link the Kigamboni area. In order to optimize the capacity of the bridge it should be constructed with a public transport priority and include 2 BRT lanes as well as a dedicated Cycleway and pedestrian pathway.

Phase 5 Route Operation

The operation of routes from the Kigamboni area is likely to require two routes; one to travel from the southern peninsula region beach area over the bridge to Kariakoo via Kilwa Rd and the other from the Kigamboni area travelling south and west to the bridge and joining the BRT at Kilwa Rd.

Two secondary route (S15- S16) will operate on the peninsula providing cross area services and connecting to the BRT as listed in **Table 5.3.8**.

Table 5.3.8 List of Phase 5 Routes

Phase 6	Bridge to Kigamboni (full 2015-2020 network)		km
New	991	South Kigamboni to Kariakoo	14.5
New	994	Kigamboni to CBD	18.6
New	S15	Southern coastal route to Kigamboni	25.0
New	S16	Southern inland route	14.6

Source: JICA Study Team

(6) 2030 Full network

While there is uncertainty in planning much detail for a 20 year time frame, this final stage assumes the development of the 2030 Road plan with the development of additional trunk roads from the

Kigamboni peninsula towards the western suburbs. The plan also includes the Boko (via Tegeta) BRT extension although this could be brought forward at any point when demand is sufficient. This Boko BRT section would replace secondary bus route S13 which would be diverted via the coastal road to Bunji.

The indicative routes for the Year 2030 plan are shown in **Table 5.3.9.**

Table 5.3.9 List of Phase 5 Routes

2030	Full network		km
New	600	Kigamboni to Ubungo via Vijibweni Bridge and Tabata	30.0
New	644	Southern extension to CBD via Tazara and Buguruni	33.4
New	684	Southern extension to CBD via Kilwa Rd	26.4
New	333	Northern Boko extension	18.2
Diverted to coast with intro of 333	S13-m	Northern Route via Bunji	17.9

Source: JICA Study Team

5.4 Developing Management Responsibility

To develop an effective framework for controlling and managing the public transport systems requires an organizational structure that clarifies responsibilities and accountability through a clear separation between regulator, manager and operator in both definition and function.

5.4.1 Defining Roles and Responsibilities

Separating the roles of owner, regulator, manager and operators is best done in by assigning responsibilities according to what each entity is 'good at' and creating appropriate incentives to guide their behavior and action.

The role of the Owner (DCC)

Essentially the 'government' is the owner of the public transport system assets, and in the case of Dar es Salaam is the DCC which is responsible to ensure its assets are protected and utilized to its optimum capacity and for the viability and sustainability of the system and its service delivery to the city. It is usual that the city, given its wider responsibility divests the responsibility of transport management to a more specialized Authority. The present administrative weakness of the DCC can in fact be addressed by establishing an Dar es Salaam Urban Transport Authority (DUTA) under its organization. This Authority is concerned with strategic policy and regulation managing this function on behalf of the City.

The role of DUTA (Regulator)

This entity is a senior body that is highly representative across all stakeholder interests and government

departments relative to the total activity and arena of urban transport. Typically, a Board of Management in the form of a Transport Authority would conduct this task, being representative of government and setting Strategic Policy to guide the line agency responsible for system management and operations. The SUMATRA as the current regulator would take on a pure regulatory (not policy) role, enforcing statutes e.g. licensing, vehicle safety and enforce national standards.

A Board of Management would ensure an integrated approach; being representative from all relevant city and national agencies who are stakeholders in urban transport. A role for SUMATRA would be optional on whether as a regulator it could operate independently, while maintaining a policy input to board decisions.

Strategic Policy for the bus system must incorporate a set of measurable objectives. The Authority must ensure funding mechanisms are in place to align with fare levels it may propose and its service level guidelines. It will assign the 'right to operate' to the system manager (not individual operators). Other than ensuring funding mechanisms are in place (budgets, subsidies, indicative fare scales) the Authority does not carry financial responsibility, assigning this to the system manager.

Government, through its Transport Authority sets Strategic Policy but its strength in setting operational guidelines may depend on its financial capacity. In other words, if it requires a social level of service that is not within the commercial ability of the system to provide, it would need to financially support the social component of service.

Its Strategic Policy will set guidelines for:

- Route design;
- Service parameters (fare policy, service frequency, passenger comfort standards, safety standards);
- System specifications and system branding;
- Planning for future services including service and system expansion.

Its role will include:

- Monitor system performance, and by implication, the system manager's performance;
- Develop urban development policy & plans that support bus network integration with the city (footpaths, traffic management).

The Role of Manager (DART)

The role of the 'manager' is either that of a 'business manager' of the BRT or, if a wider system network is managed, then they are the 'system manager'. In each of these roles, the function is similar.

Guided by the strategic policy set by the Authority, the system manager develops tactical policy to manage the business of public transport in the most effective and efficient way. The system manager takes a commercial and business-like approach to maximize revenue and to minimize costs within the

framework of strategic policy. The key performance measure for the system manager is financial performance achieved through customer satisfaction/revenue growth and managed costs.

The system manager contracts the operation of the buses through a performance-based contract to bus operators who perform services according to the requirements as specified in the contract. As the system manager has total responsibility for the performance of the business, they monitor and enforce the conditions of the contract. Much of the regulator responsibility of the previous regulatory role is thus taken over by the system manager. **Figure 5.4.1** shows how DART fulfils the role of system manager and the relationships with other players.

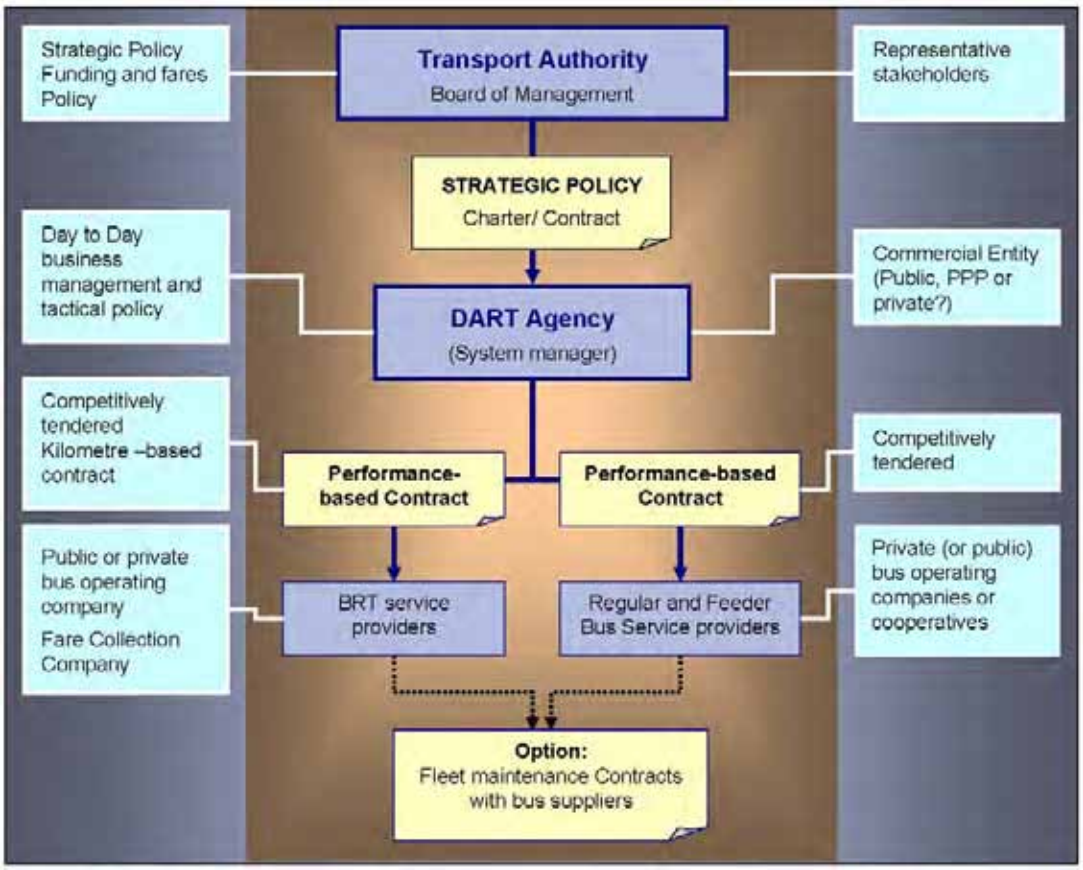


Figure 5.4.1 System Management Model

It should be noted that a number of options exist for the arrangement under which private operators are contracted to the system either by way of a performance-based contract (where the system manager takes the bulk of the patronage risk) as opposed to a franchise arrangements where the operator is given an exclusive right to operate under set regulatory conditions. There is a marked difference between these two options and various hybrid arrangements are also possible, but essentially the best arrangement is one where each player is assigned the risk they can manage.

In summary, the function of DART includes:

- Development and management of bus operation performance-based contracts (PBC) and being 'Party A' with 'Party B' bus operators;

- Specifying service levels and standards in each contract along with terms and conditions of contract;
- Planning and route network development;
- Managing fare policy within guidelines set by the Authority;
- Management and maintenance of system infrastructure and information systems;
- Monitoring system performance and contractor performance:
- Survey data and user feedback;
- Benchmarking system cost recovery;
- Safety standards;
- Enforcement of standards;
- Revenue control and financial management.

The present DART charter[2] is fully in accordance with this concept of system management.

The role of Operator

The role of the operator is to perform services according to the specifications and standards of the contract. There is a clear client/principal relationship in place and very clear expectations stipulated in the contract. It also defines the responsibilities and duties of both parties in the contract and therefore provides the basis for investment. The system manager (DART) can enforce the condition and service requirements under contract.

The performance-based contract is managed by the DART Agency through the mechanism of a 'Regulatory Procedures Manual' (RPM) being an agreed 'yardstick of procedures' for the management of contract. The RPM can be adjusted from time to time to cater for changing circumstances, but is aimed at providing consistent and fair guidelines in dealing with contractors.

5.4.2 The DART Vision - a capable and strong system manager

It is clear that to develop an integrated mass transit system the role of a system manager (DART Agency) is paramount, and DART through its role and function is not only able to effectively manage the business but is also best placed to assume the risk.

The institutional arrangement must actively develop the strength and capacity of DART by keeping it free from political pressure and interference, be held financially accountable and maintain a strong and contractually sound management of the bus operations.

In conclusion it should be stated that in a macro perspective, the DART Agency should addresses conclusively the requirements for a successful public transport operation and its chances for success are be considerably improved by the upstream organization of an Urban Transport Authority and the proper placing of DART in the context of the wider supportive Transport Master Plan. The secondary routes providing a well integrated network as outlined in the network plan are also vital in supporting

[2] As outlined in The Executive Agencies (The Dar Es Salaam Rapid Transit Agency) (Establishment) Order, 2007.

the viability of the BRT operation but also distribute the wider benefits of BRT to the broader network.

5.5 The DART Business Model

The Establishment Order (2007) for DART provides a good strategic policy framework under the direction of the Ministerial Advisory Board, outlining the functions of the agency and its responsibility and accountability to ministerial level. The DART charter has a strong objectives-based focus and shows clear intention of outcomes.

However, a successful DART will depend on its business model which dictates primarily:

1) how it manages the business and

2) how it manages the contracts under its control.

The business plan of DART should define its key functions and specifically its relationship with contractors, requiring a clear assignment of risk under detailed contractual frameworks. This will result in a clear and unambiguous relationship between contractors and the contracting agency and that the business and risk environment is understood by investors.

It is apparent in the planning and commission of the DART organization that it is to be commercially oriented, subcontracting its various service delivery functions to contracted bus operators, a fare collection company and an independent fund manager respectively.

5.5.1 Performance-Based Contract and Risk Management

The success or failure of the system is dependant on the type of contract and conditions under which the operators are granted; specifically the risk carried by each party in the contracts as it influences the behavior of the involved parties [3] directly affecting service quality. The basic principle to follow is to assign respective risks to the party that can best manage it. Poor outcomes result when parties are contracted to assume a risk they cannot control or manage.

It is understood that Phase 1 BRT proposes to invite 2 BRT bus operating entities who both will operate both trunk and feeder services. This concept is supported as it will provide a comparison between operators and also avoids DART being wholly dependant on one operator alone.

This master plan recommends to employ the concept of "**Multi Operator Contracts**". This is often referred to **Performance-based contracts (PBC)** and best described as a contract that procures for the contracting agency, kilometers of bus operation for a fixed sum per kilometer. The 'performance' aspect comes from the conditions within the contract where the operator can be penalized for failures in service delivery, (or conversely be rewarded for excellent service delivery). Ultimately the terms and conditions of the contract are enforceable, giving the contracting agency a strong hand in managing service outcomes.

[3] This works both ways; being that a government that carries no risk may be dismissive of the problems of the passenger transport system (can blame operators if things go wrong) and the operators on the other hand, will do anything to survive economically; even to the point of endangering public safety.

There are two types of contract; a **gross-cost contract** where there is little risk for the operator as they are paid for kilometers operated although some penalties may be incurred for service failures, contract breaches and operational misdemeanors. The role of the operator is to provide services to set standards and to control their costs. Under a **net-cost contract** (where operators are paid for passengers carried) there is more incentive to win passengers and these net-cost contracts are more suitable in feeder services where an operator is designated a service area and can develop the business.

The common misconception that net-cost contracts rely on fare box revenue is not correct, as the system pays the operator on a 'per passenger' basis (not a per km basis). This allows the operator to tailor services according to the needs of the community in the most efficient way. The contracting agency is obliged to pay the operator to provide non-commercial services (such as late night services) if it required non-profitable services to be provided under a public service obligation (PSO).

A PBC is a simple contract where the operator performs services according to the specifications and standards of the contract. There is a clear client/principal relationship in place and very clear rules and expectations stipulated in the contract so the agency can enforce the condition and service requirements under contract. There is less risk for operator (main task is to deliver quality service and manage costs) whereas the agency takes responsibility for service levels. A key incentive for the operator is not just to avoid penalties but the prospect of contract renewal.

The role of the operator under a simple PBC is to:

- Provide bus services according to specifications and quality standards outlined in the contract;
- Provide operational staff (drivers and controllers) to man the buses for operation;
- Clean, fuel and maintain buses;
- Manage the maintenance contract with the vehicle supplier for repair and maintenance of buses;
- Make reports to BRT system manager.

Typically the strengths and advantages of a Performance-based Contract are:

- Essential system planning functions is retained with government offering integrated and unified system control and management under single (accountable) agency;
- As responsibilities of both parties are clearly defined and contractually enforceable, it provides a sound basis for investment;
- Risks are allocated where they can be managed with less risk for operator (main task being to deliver quality service and manage costs);
- Bargaining position between Agency and operators is more balanced;
- Market competition is maintained as operators bid for services;
- Revenue is centrally controlled and spread equally across the system;
- Contractors supply service to quality standards and at efficient cost with accountability under contract, being paid for services provided;
- Provides an incentive for performance (avoiding contract penalties and the prospect of contract renewal);

- Rights and obligations are detailed in contracts and contracts are enforceable by law; while service specifications are outlined in a more flexible framework to adapt to service needs;
- Where per km prices are realistic and cost indexes are included, contracts are likely to be commercially viable increasing the prospect of investment and finding sources of finance.
- Develops benchmarks and comparisons (and possibly competition) on service quality between operators;
- Substitute operators can provide service continuity in case of operator failure;
- Identifies better quality operators for short listing for further phases in BRT.

The disadvantages are:

- Financial resources spread thin across various operators;
- Business expertise and experience spread across multiple entities;
- Ability of smaller entities to raise finance may be problematic;
- BRT authority must deal with multiple operators.

Performance-based contracts can be used for multiple larger and smaller operators who are providing services on: Option 1) an allocated busway route shared with other operators, Option 2) on a flexible basis where the agency contracts a set amount of kilometers with an operator and the agency can assign those kilometers to any number of busway routes to adjust for variations of demand or Option 3) providing feeder services in a designated service area. For busway operations Option 2 is the better option as it allows a high level of flexibility to the agency to change service specifications without having to continually renegotiate contracts.

It is finally concluded that the ideal contract for the bus operator is a straightforward contract to provide bus transport services on a kilometer-paid basis, holding the operator fully accountable for service delivery to the standards and specifications set out in the contract. This gives the system manager a strong hand to manage and enforce the service delivery through contract obligations abut also creates a clear and understandable business environment for the operator.

5.5.2 Regulatory Procedures Manual

A key mechanism to manage the contracts is a Regulatory Procedures Manual being a standard manual of procedures and processes under which the government administers control and management over the bus contracts. It serves as a guide for the management of system issues and the monitoring of the contracts under which bus services are provided.

A Regulatory Procedures Manual (RPM) while being a consistent yardstick of procedures is open to periodical amendments through proper process, but not needing changes in law. The RPM is a document that DART as the system manager will operate under and is a key instrument that will assure contracted operators of fair treatment.

Guidelines included in the manual relate to the following areas:

- Procedures for tendering and eligibility criteria for operators;
- Responsibilities and duties of the agencies;

- Responsibility of the operators;
- Funding guidelines and methods to set fares;
- Adjustment to routes and service parameters;
- Procedures for extraordinary occurrences;
- Enforcement methods and dispute resolution procedures;
- Monitoring guidelines and requirements; and
- Reporting procedures.

Regulatory procedures should be explicit, offering clear guidance so as to reduce the amount of 'ad hoc' and arbitrary decisions that need to be made with individual operators and reduce the scope of matters that need to be individually decided (or open to influence from operators).

The RPM must set high standards and define the role and responsibilities of the DART Agency to show their compliance with procedures and to build confidence in the regulatory and planning process to other stakeholders. Procedures defined in the manual include all of the rights and obligations of the parties as well as all tasks, adjustments, and considerations placed under the scope.

5.5.3 Involvement of the Existing Industries

The current planning (as of early 2008) is favoring the option of two large operating consortiums contracted under a Performance-based contract for the Phase 1 operation (**Figure 5.6.1**). This idea is supported as it provides competition and also provides the economic scale under which to consolidate the many smaller players. The operating entities will also provide both trunk and feeder services.

A benefit to having two large operating entities operating both trunk and feeder is that it provides a mix of business that ensures comparable resources are provided for both service types. This includes depot and parking space, workshops and maintenance facilities and provides some economies of scale in terms of management and administration. It is possible for the existing industries to join this new operating framework (see **Figure 5.6.1**).

It should not be overemphasized that the probability of engagement of such private sector partners is dependant on the way risk is managed. While, the competence and reliability of DART as a business manager and as a competent administrator is critical both in terms of perception and also in reality for investors to see this as a viable business opportunity. DART should be responsible for patronage growth, and must prudently manage the passenger transport business to be able to fulfill it obligations to pay private sector operators. It is likely that the government may want to consider a financial safety net that hold funds in escrow as contingency for DART so it can meet its obligations in unforeseen circumstances.

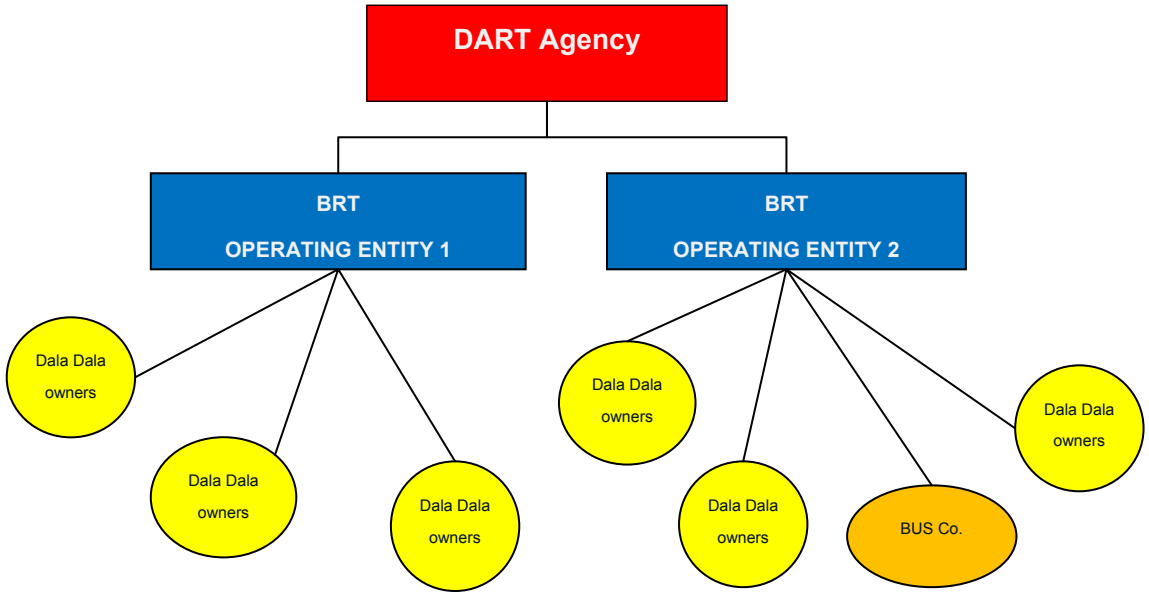


Figure 5.6.1 Multiple operators formed from existing groups

5.6 Dala Dala Bus Service Improvement Strategy

The approach to the improvement of Dala Dala operation involves a community-based approach with the involvement of three stakeholder groups – the government as a key stakeholder, an owner/operator community group and a management group.

The problem must be approached with recognition that the Dala Dala industry is a struggling industry operating and surviving on the lowest common denominator of cost and quality. A keen appreciation of the insecurity and vulnerabilities faced by the players is essential in order to develop the necessary solution. In fact, in the interview survey, Dala Dala drivers indicated a preference for reliable work arrangements over the uncertain employment arrangements they presently experience.

At the same time it should be noted that the Dala Dala industry is basically unmanageable due to it fragmented nature (individual ownership) and operating largely outside the proper management structures. Formalizing such a fragmented industry will require a committed effort to consolidate through an effective consolidation framework designed to deliver mutual benefits to regulators users, owners and operators alike.

An '**effective consolidation framework**' requires the involvement of all stakeholders who perform their function based on their relevant resources and abilities and developing proper interaction and relationships with other stakeholders.

First, the government, who mostly has the resources (financial and legal) to create a basis for a solution, but relies heavily on its role as an administrator to carry out the task properly to achieve its aims. In order to approach the issue, the government must (in part) relinquish the role and attitude of being 'regulator' and adopt the role of 'manager', seeking to understand the issues and how to manage them

toward the set objectives.

The mechanism of government involvement should be 'demand oriented' which (by definition) is to be consultative and responsive. Setting strategic policy toward set objectives and allowing the formation of tactical strategy at a local level with the community is a way of allowing management to adapt to changing situations, respond to new information as it arises and to changing needs.

Furthermore the government's span of management includes setting the regulatory framework in order to create suitable and favorable conditions to assist the on-ground management of the problems. These would include:

- Creating through the operator associations such as DARCOBOA, cooperative alliances (area based) to consolidate operators into community groups or companies to improve representation and develop structures of managerial authority and accountability.
- Developing codes of conduct and operational standards (either voluntarily or tied to the 'right to operate') which are also supported by resources.
- Creating access to credit to upgrade equipment including emergency fund facilities to manage shocks as they occur (for example, an industry fund for accident & sickness administered by the cooperatives for member benefit).
- Improving the security of employment for drivers and conductors through enforcing labor rules as part of the 'right to operate" (permit condition).
- Once organized and accountable, the industry may be recipient of some form of limited subsidy for providing special services requested by government (e.g. student travel).

The second stakeholder group is the community, involving owners and operators as part of the organized community groups. For the government to take a community based approach, requires both the organization of a communal voice, and the linkages to other support groups (including other cooperatives facing similar issues).

With a targeted and problem solving approach by government and an organized community of owners and operators through cooperatives or companies the processes will develop to ensure better service delivery and continuation.

A third stakeholder could be a management group who are assigned the task of managing the project. DARCOBOA may be an ideal candidate for this task and the representation on this group would include representatives of government, NGO's and the community. One primary aim of this group is to gain an understanding of the real issues in order developing adaptive policies to manage reach the objectives. It is therefore necessary that a bottom-up approach be taken so that the management group recommends the policy framework to create the conditions for project expansion and continuation.

In summary, the mechanism will be a collaboration of stakeholders, working toward a community based solution, with each player contributing their resources and abilities toward mutual objectives.

Chapter 6 CBD Traffic Management Plan

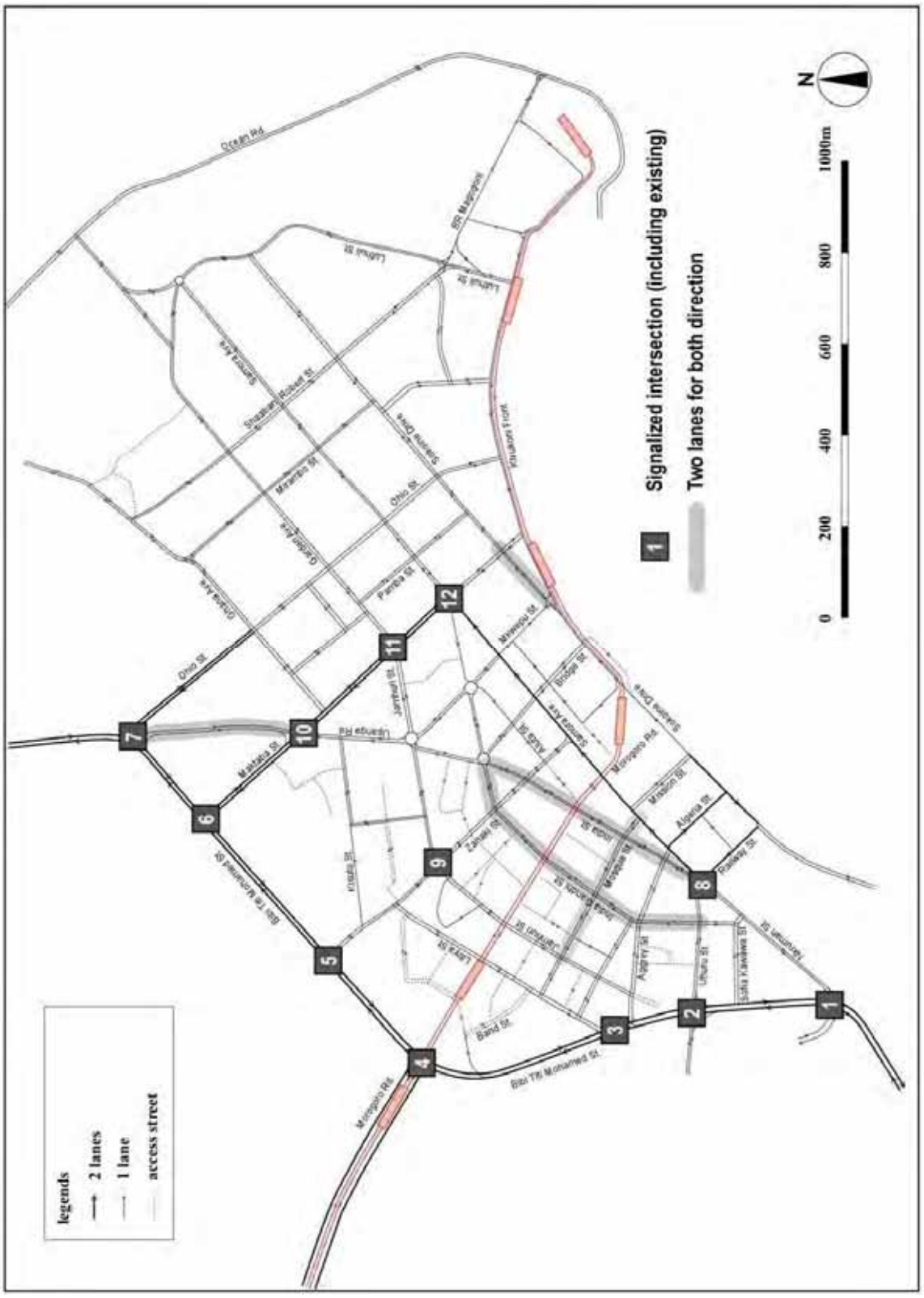
The core objectives of the Central Business District Traffic Management Plan are:

- Focus on a near-term (2009/2010) implementation of high priority projects whose realization is closely linked with, and mutually supportive of, the impending BRT Phase I project;
- Maintain maximum accessibility to CBD destinations, thus avoiding circuitous travel with consequent impacts upon the transport system;
- Maximize capacity of the CBD network with low-cost, high-impact solutions such as removal of on-street parking, signalization of intersections, judicious, use of one-way streets and strategic widening of streets in a limited number of cases; and,
- Avoid the construction major new road infrastructure; instead, focus on the provision of public transport and pedestrian facilities.

6.1 Short-term Road System Improvement Plan

Based on the objectives, a recommended road network and parking plan was developed. The major improved points are (**Figure 6.1.1**):

- Improvement of Ohio intersection with Bibi Titi Mohamed St. including connection of Upanga Street into the intersection of Ali Hassan Mwinyi Road.
- Connection Jamhuri Street to Garden Avenue.
- Connection BR Magogoni Street to Shaaban Robert Street.
- One way system along Railway Street and Algeria Street.
- Removal of on-street parking and conversion to two lanes along India Street, Indira Gandhi Street, Mosque Street and a part of Sokoine Drive.



Source: JICA Study Team

Figure 6.1.1 Recommended Short-term CBD Circulation and Parking Plan

Fine-tuning for both the layout and operation of key intersections involve the removal of roundabouts (Askari Monument, Clock Tower), provision of proper channelization and turning lanes, provision of signals, and providing signal cycling and timing in accordance with real-world traffic demands. The intersection improvements are presented in **Figure 6.1.2**.

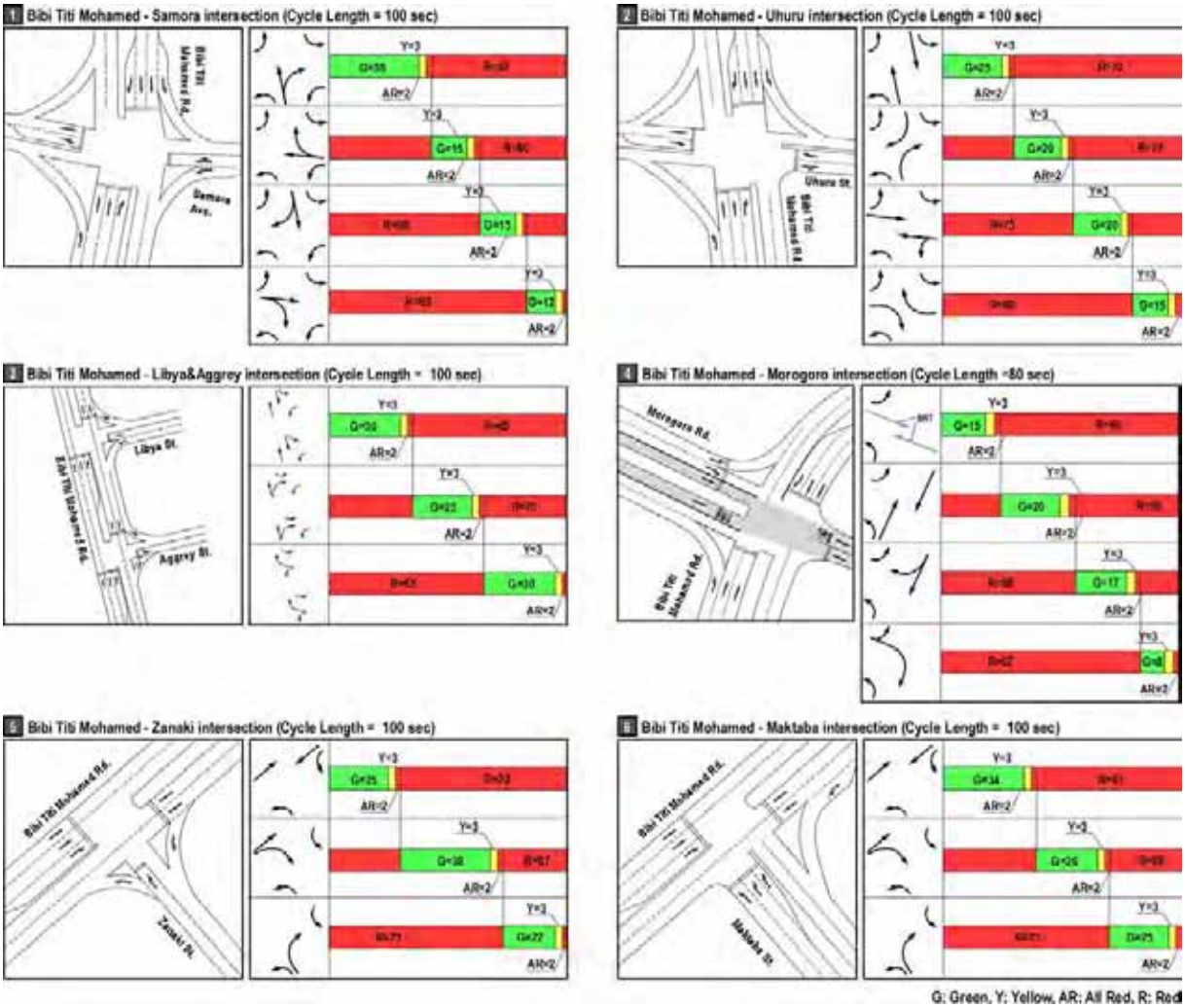


Figure 6.1.2 Intersection Improvement Plan (Part 1 of 2)

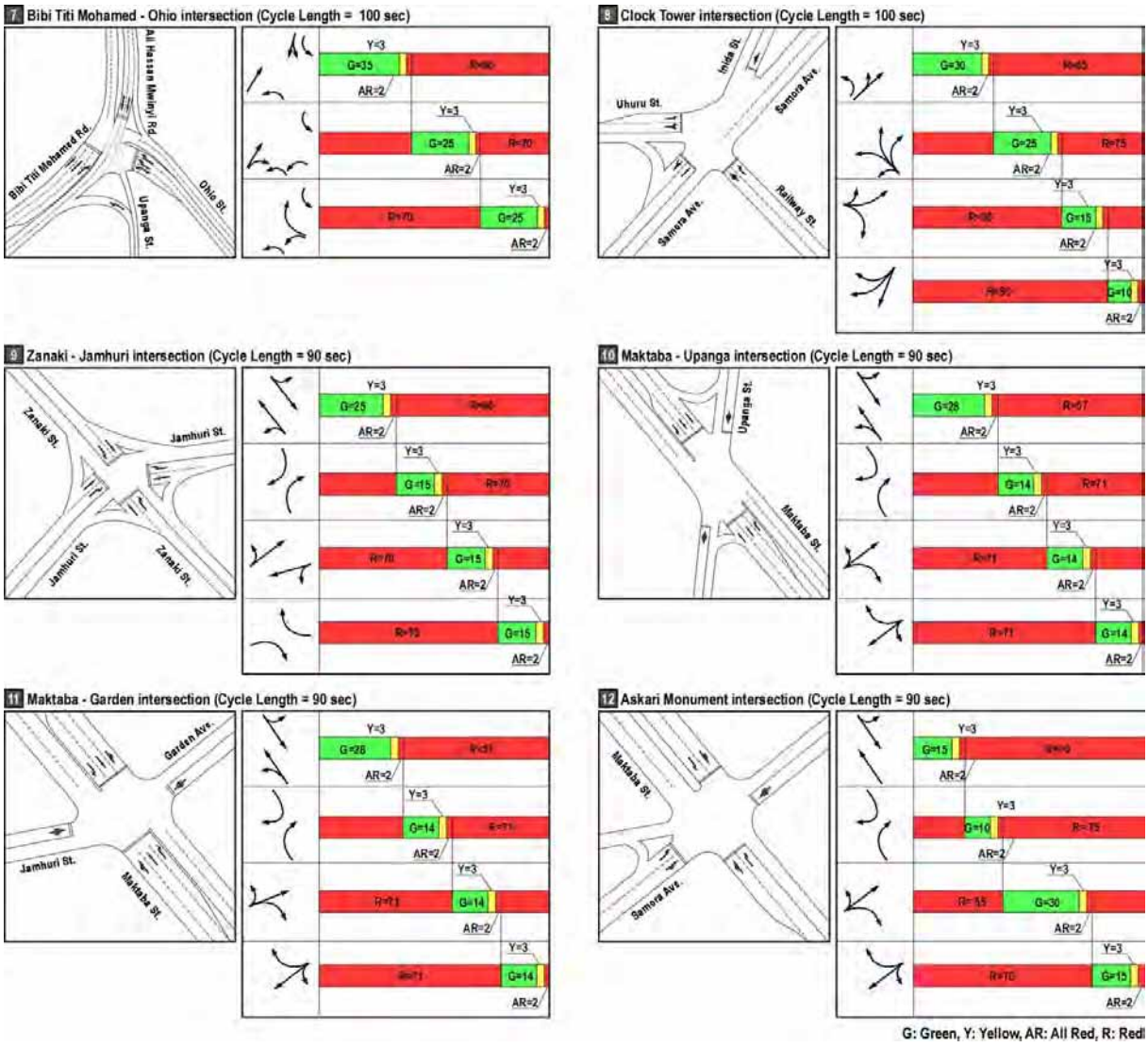


Figure 6.1.2 Intersection Improvement Plan (Part 2 of 2)

Several other improvement potentials are noted:

- Various transport issues exist in the southern CBD flank vicinity of the Gerezani area relating to the on-going upgrading of Kilwa Road and interconnection of various BRT lines involving both Phase I and subsequent systems. It is strongly noted that any solutions proposed to address the Gerezani issues cannot involve the provision of road infrastructure which will encourage mixed traffic to enter the CBD. The above-proposed year 2009 circulation scheme is in balance, and overall approaching capacity. Roads and intersections simply do not possess sufficient reserve capacity to absorb additional traffic volume which would be catalyzed by new infrastructure penetrating the CBD cordon.
- There remains a safety concern at the major crossing points of BRT and roads. While BRT is seen as a pedestrian-friendly mode, it would nevertheless, be preferred to provide flashing warning signals at road crossing points (BRT having the right-of-way over road traffic).

- The proposed intersection modifications include optimized signal timing. A next logical step is the interconnection of signals, say along Bibi Titi Mohammed Street, via an appropriate off-set to further reduce stops. Such interconnection can be obtained via a local controller, or through the capability of a Central Traffic Control Center (**Figure 6.1.3**).

Figure 6.1.3 Elements of a Central Traffic Control Center

- Bibi Titi Mohammed Road functions, in effect, as a CBD "ring road", with major radial connections serving the CBD. It is, in general, desirable that this circumferential capacity be increased to the order of three lanes per direction. However, such decisions must be further reviewed within the broader context of the long-term road network as derived for the overall Master Plan.

6.2 Long-term Plan – Multi-dimensional approach with TDM

To overcome the limitations of the short-term CBD traffic improvement plan, which is in fact limited to short-term traffic mitigation measures, a more extensive (or a different) approach is needed in a long-term perspective, specifically to install traffic demand management (TDM) as a major thrust of the strategy, and once these measures are actualized, then to manage the supply appropriately.

A long-term comprehensive TDM strategies for CBD development must be adopted such as constraining high rise building development and pedestrian focused development to promote use of public transport measures as well as to increase historical value of the city. While, Morogoro road has been identified by this Master Plan as the new focus of urban regeneration as easy transport access is provided once the Phase 1 BRT is implemented. This will take the development pressure off the CBD to retain its ambience as a Harbour city. In terms of modal split, one major focus is to increase the total proportion of trips using the public transport systems, yet this raises great challenges. While being the most achievable measure in the short to medium term it requires

active cooperation and political strength to build and implement a modern public transport system.

A set of strategies for the long-term CBD traffic management includes:

- Long-term planning guidelines to govern land use and development so as not to create development without transport arteries (or be faced with very expensive options in the future to repair planning failures).
- Enhanced public transport options as a viable alternative to private car use including BRT as well as supporting bus route networks.
- The use of an inner city circulator bus service.
- Park and ride options.
- Pedestrian streets – increase value of the heart of the city.
- Cycleways and NMT facilities
- A balanced parking plan that meets essential needs without creating perverse incentives.

Given that the above are actively managed, a traffic circulation and management plan will be developed to optimize the city streets and create order including the use of active traffic control via a traffic control centre.

It should also be stressed that the future of Dar es Salaam as a competitive city relies heavily on way the CBD and the city functions. An extremely high priority is to reduce car dependency which is synergistic with strategies to cope with the rising cost of fuel and its impact on transport costs and its flow-on inflationary effects on the economy. Improving human productivity through reducing travel time, lowering transport costs and improving economic performance could be a large positive gain from addressing the city's transport problems. This could effectively help to mitigate the future risks that loom large over the local and national economy.

It is therefore proposed a strategic approach containing demand mitigation as well as traffic control and management. The strategy is illustrated in **Figure 6.2.1**.

6.2.1 Recommended TDM Strategies

There are three approaches to reducing traffic being avoidance (planning and land use guidelines that reduce demand), incentives for motorists to use alternative modes, and lastly, control mechanisms that enforce the permissible level of traffic (such as pricing control and permits).

(1) Avoidance Mechanisms

Land use planning and coordination

This is termed an avoidance mechanism in that it seeks to avoid traffic congestion by better planning to reduce demand as a whole. Land use permissions and urban design that enable communities to walk or ride to work instead of travelling large distances saves time resources and reduces the demand on mechanical modes of transport. Overseas urban regeneration has been a success story; reviving outdated industrial precincts and redesigning them into medium density housing, office space, community areas and amenities and a town centre. These designs allow communities to develop around

work places thereby significantly reducing travel demand.

Coordination of planning is essential to harmonize the way the city functions, ensuring that urban development planning and transport works together for the desired outcomes. The proposed Dar es Salaam Urban Transport Authority should have active participation of the City's urban development fraternity.

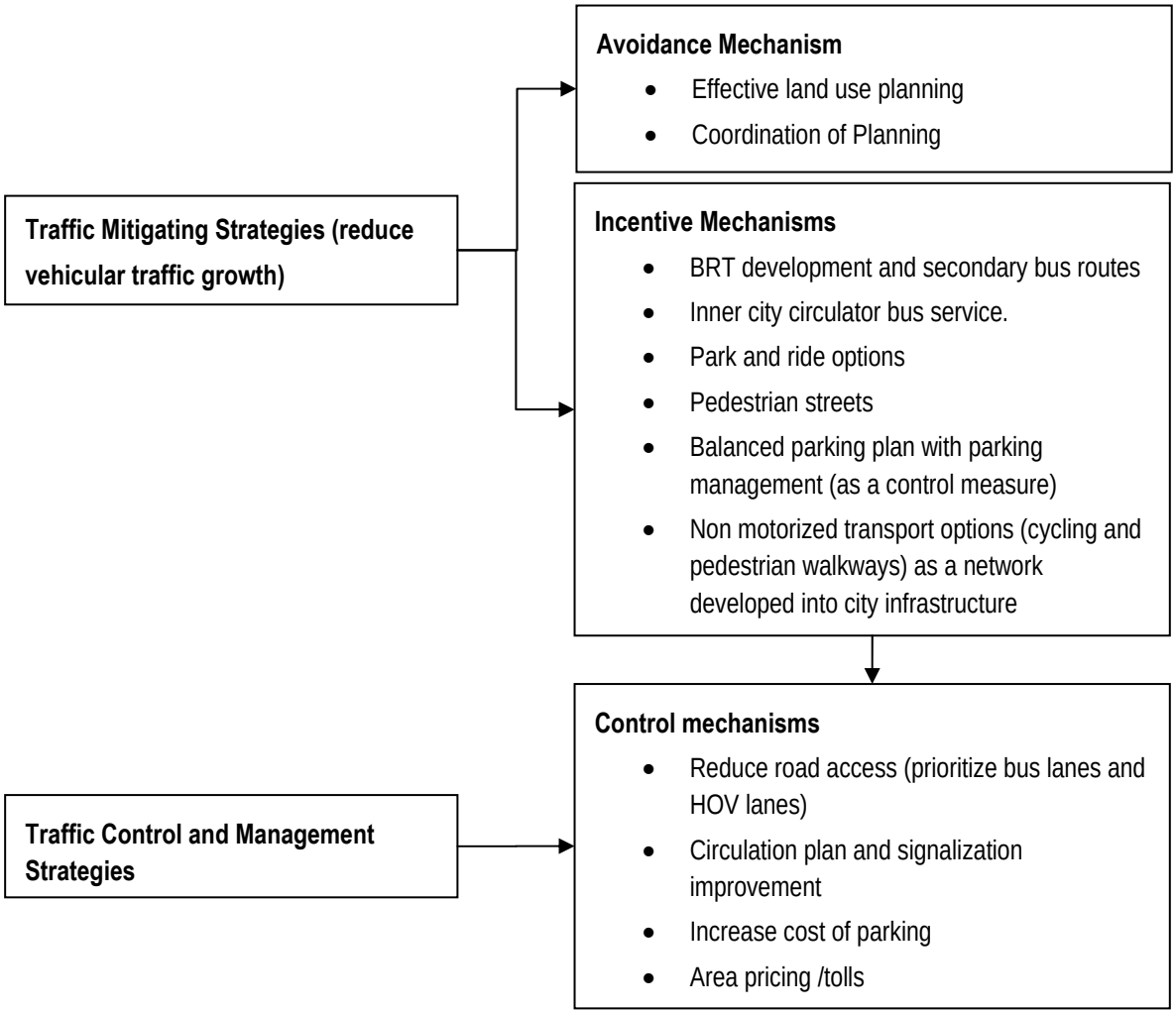


Figure 6.2.1 Traffic Management Strategies

(2) Incentive Mechanisms

BRT development and secondary bus routes

One obvious strategy for Dar es Salaam is the development of public transport along its major entry corridors (primary arterial roads) to instigate a modal shift from private cars. This system however needs to provide a level of service and convenience similar to private car travel so it can be a 'preferred choice' rather that the option of last resort.

The dual advantage of such an approach is that by using actual road space presently used by cars, public transport (BRT or bus priority lanes) reduces space for mixed traffic thus serving as a metering

device for traffic as well as providing a high mobility alternative for travelers.

The priority projects for public transport include:

- The Phase 1 BRT from the western entry of Morogoro Rd,
- The proposed further BRT phases from the southern entry point (Nyerere Rd, Kilwa Rd).
- A tidal bus priority system by using the centre lane from Selander Bridge with a Bus-only access into Upanga St to Posta and the office precinct in the northern CBD area.

The increased use of public transport is a current and prominent national objective which has seen the establishment of DART and the expected introduction of the Phase 1 BRT in 2010. Preliminary planning has been completed under the DART Operational Plan (2007) and this needs to be taken into account in the overall CBD planning. A public transport plan for the CBD should be in harmony with traffic circulation and road use assignment and design, and also consider the impacts of BRT with its initial and future phases, the secondary bus route network route and the realignment of Dala Dala routes.

Phase 1 BRT Introduction

The Phase 1 BRT routes will operate into the downtown area using Morogoro Rd and Sokoine Drive to the Kivukoni terminal on an exclusive busway. The introduction of this Phase 1 BRT will have a major impact on the traffic situation of the CBD, positively in the sense that offers a good public transport alternative, potentially reducing car use; but in actuality reducing the number of Dala Dala routes to the CBD; but also some negative impacts, being that the BRT in taking sole occupancy of CBD road space[1] may impact on congestion. Modal shift to the BRT will often the impact but the problem is that BRT in its early phase will only provide service on a single main corridor and not all CBD commuters can avail themselves of the service.

Implementing Secondary Bus Routes and a Northern Bus Priority

A particular area of focus should be the car traffic travelling to the CBD from the northern areas (Msasani peninsula) along Ali Hassan Mwinyi Rd with the primary destination being the office precinct of Ohio Rd. As this corridor is not identified as a future BRT, the early introduction of the S5 Secondary route is a good strategy that can reduce this traffic in the very near term.

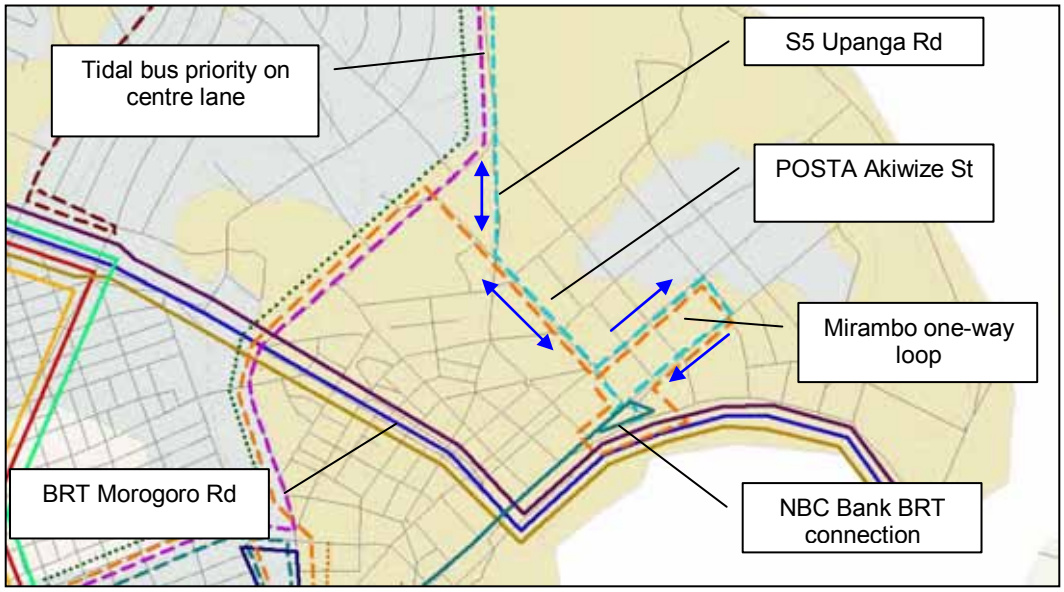
The key concept of the S5 Secondary bus route is the implementation of a high quality (air-conditioned) bus service from Msasani Peninsula which operates as a bus priority across Selander bridge, given priority by tidal flow traffic management in south of the Selander bridge to the intersection at the Movenpick Hotel, and then crossing the intersection to a dedicated bus only lane into Upanga St to connecting to Maktaba St (Posta) and travelling via a one way Mirambo St Loop connecting to Sokoine Drive where it connects to the BRT. The necessary infrastructure is road markings and a signaling system that controls and monitors bus movements as buses operate on the bus lane inbound in the AM and outbound in the PM (returning buses use mixed traffic lane).

[1] This resumption of road space however is not highly critical as the Morogoro Rd section from Bibi Titi Mohammed Rd to the DCC precinct is not a major arterial road and the one way design of Sokoine is maintained.

The S5 service could also connect with a future Park (kiss) & Ride facility placed north of Selander bridge to reduce the traffic loads on the northern approach to the CBD.

Implementing such a bus service could be implemented under the same contractual arrangements where by operators are contracted under DART, either under one of DART's two bus operating entities or another company contracted for the purpose.

Figure 6.2.2 shows the Upanga St dedicated Bus Priority Lane and its continuation of a one-way Tidal Bus Priority on Ali Hassan Rd. Route S5 enters mixed traffic on Maktaba St joining other secondary routes shown as dashed lines.



Source: JICA Study Team

Figure 6.2.2 CBD Circulation Plan BRT Phase I and Supplementary Bus Routes

Re routing of Dala Dala routes

It is expected that Dala Dala activity will decrease with advent of the BRT Phase I system, and the secondary routes. However, some Dala Dala activity will likely remain after Phase I, but be gradually reduced in scope as additional BRT phases come "on line". At present, the final status of Dala Dala lines vis-à-vis CBD services is not known, as this is dependent on further negotiations between the operators and SUMATRA. However, it is likely that some routes will continue to serve the CBD, assuming (a) those routes service precincts of Dar es Salaam not adequately covered by BRT Phase I or secondary bus routes, and (b) the route structure being so that interchange with the BRT system outside of the CBD is seen as impractical or circuitous vis-à-vis passenger desires.

The challenge is therefore to find a routing concept for remaining (post-BRT Phase I) Dala Dala services that permits efficient interchange opportunities for the mode, yet concurrently "fits" with the BRT and secondary routes concept. The proposed circulation pattern is patterned after the existing BRT Phase I Dala Dala routing plan, with appropriate adjustments (**Figure 6.2.3**). The Posta route connects with BRT at the Old Posta station and existing Kivukoni route connect with BRT at Kivukoni

terminal. Route overlap has been minimized as practical and possible; however, some overlap is unavoidable given that only limited roads are available for public transport operations.

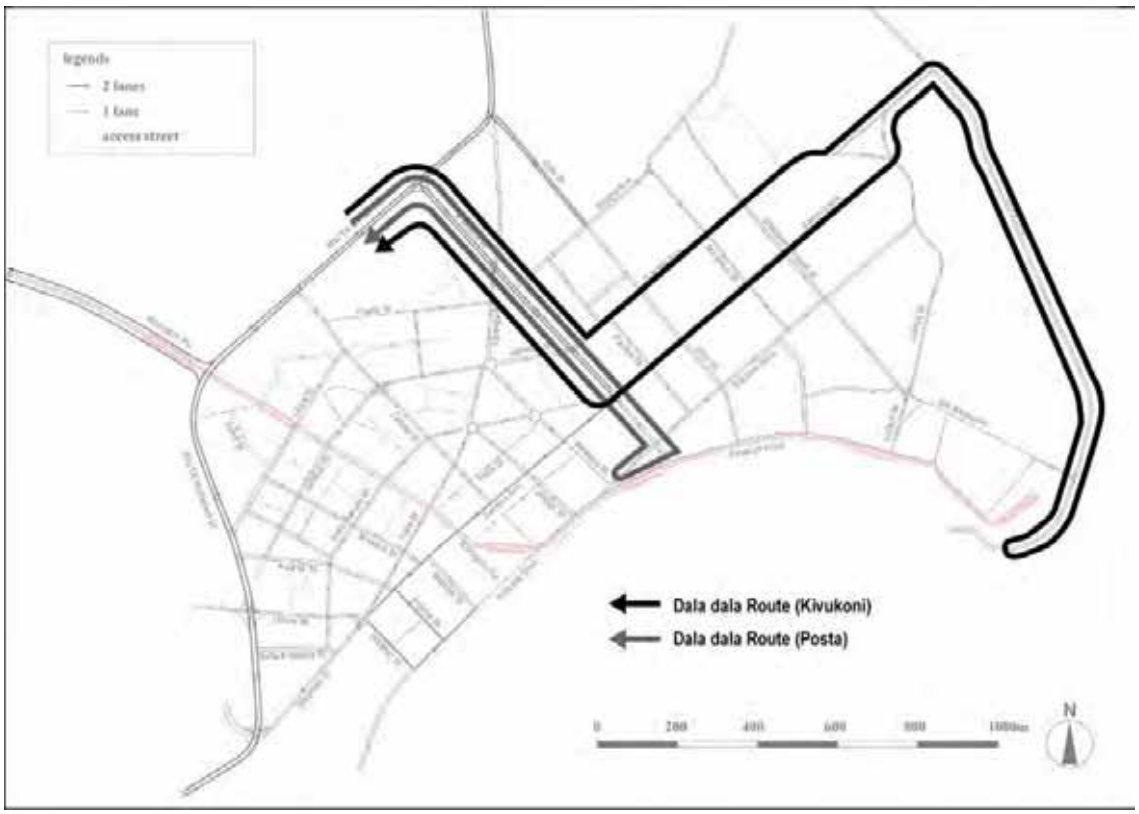


Figure 6.2.3 CBD Circulation Plan: Dala Dala Routes

Inner city circulator bus service

A greater dependence on public transport will require that commuters have easy access to a range of inner city destinations once they reach the city. An inner city distribution bus service operating at regular intervals means that there is less reliance on cars.

Park/Kiss and Ride options

Promoting public transport for city related trips means that commuters must have easy access to the system from their homes. As it is not always possible to have a bus service close to every home, the availability of Park / Kiss and Ride facilities is a way of connecting homes to the transport system by providing safe and secure parking facilities such as at a large shopping mall for people to leave their cars and travel by bus to the city. In the short term, many car trips are form the northern peninsula and a Park/Kiss and Ride facility in the vicinity of Ali Hassan Mwinyi Rd is a good early action to consider. This needs to be implemented in conjunction to the S5 route operating as bus priority over the Selander Bridge.

Non-motorized transport and pedestrianization

Dar es Salaam has some unique opportunities and advantages as far as non-motorized transport (NMT) and pedestrian modes are concerned, and can utilize these modes very effectively to improve the conditions and attractiveness of the city. Consider the following:

- The city has a flat coastal terrain with sea breezes making walking and cycling a suitable option.
- The coastal ambience the harbour city with its rich historical building lends itself to being a major tourist destination as a springboard for other Tanzanian tourism destinations. Cycling options for tourists would make the city a very enjoyable 'African city' experience and provide real benefits to the city economy as tourist would spend extra days in Dar es Salaam.
- Push carts are a common sight, used to transport good throughout the CBD in an efficient and non polluting way. But these are often persecuted as they are seen as being obstructive to traffic.

Given these opportunities, the view of Kombe, Kyessi, Lupala, Mgonja (2003) is highly supported, that is, "a mandatory provision for non-motorised modes (bicycles, pull-/push carts) in new road design and construction projects in the city, as well as during the improvement of the existing local and arterial roads, should be instituted so as to provide for enhanced use of non-motorised transport."[2]

It is extremely important to make NMT and pedestrian-ways a network and not just a 'token' bikeway. NMT is a real and practical modal option that is mobilizing, non-polluting, non-invasive, non-oil dependant, and very space efficient. Its inclusion as a major platform of inner city mobility is essential.

Figure 7.4.8 in Technical Report 2 shows a prospective cycleway option that provides a useful network for cycles and carts throughout the city as well as the pedestrian streets. The plan needs refinement and a detailed feasibility study but demonstrates a potential idea.

[2] In: Partnerships to Improve Access and Quality of Public Transport by Prof. W. Kombe, Dr. A. Kyessi, Dr. J. Lupala & E. Mgonja University College of Lands and Architectural Studies Tanzania (Edited by M. Sohail) 2003.

Balanced parking plan with parking management (as a control measure)

Parking availability while often seen as a 'solution' (build more parking stations and free up roadside parking space for traffic) is actually a two-edged sword as the provision of additional parking in the CBD (to alleviate on-street parking) is self-defeating as more availability creates more demand for both parking space and road use. Development guidelines that force developers to build minimum levels of car parking space in line with the floor space size of the building is an intuitively sensible approach but likely fail in that it does not take into account the external costs of increasing car use.

One recommended approach is a pricing policy that taxes car parking places heavily in the property tax so that motorists are then charged by the building owners for car park use. This provides the necessary disincentive to use the car (on account of time-based cost) but also creates a revenue source for the city to invest in facilities that positively impact on city life (for example, funding to create cycle paths, greenery and pedestrian walkways). Making car parking costly, will control demand, yet also make it available to motorists where necessary.

In this regard, the present management of car parking in the downtown area is a step in the right direction, as it levies a price against parking users. An improved parking plan must be developed to reduce informal and illegal parking and enforce the parking rules. However, any pricing, control and enforcement strategy should be accompanied by viable alternatives so that motorists have modal choices and that the cost levies are used as mechanisms to persuade a change of travel behavior and practice.

(3) Control Mechanisms

Reduce road access (prioritize bus lanes and HOV lanes)

There are two types of 'capacity' in dealing with CBD area, the first being the capacity of the approach roads which is a key factor in the time it takes to get to work. The second is the capacity constraint of the inner road network within the CBD, which when saturated, brings traffic movement to a virtual standstill. Both types of capacity saturation are commonly seen today indicating that saturation during some periods of the day/week is already reached.

The approach capacity actually serves as an essential metering function during the morning peak as was demonstrated in the simulation, showing that improving approach speeds transferred the problem to inner city locations. Measures to control/constraint approach capacity measures are therefore a mechanism which can be used indirectly to keep the inner city moving, or directly to encourage motorists to use alternative more space efficient means to travel to work.

Such measures include signal control, reducing or limiting, or not building extra road space on city arteries, or area pricing in CBD.

Area pricing /tolls

Once incentive mechanisms are in place (namely being good mass transit alternatives) further measures

can be enforced to control the level of traffic. Area pricing mechanisms can be applied and charges for vehicles entering an area.

6.2.2 Future Northern Access Strategies

It is evident that in future years the single northern link of the Selander Bridge will be insufficient to carry anticipated demand, requiring some strategic measures to improve the northern city access. The major constraint is that the section of Ali Hassan Mwinyi Rd is difficult to widen. The Selander Bridge presently serves both the Msasani Peninsula and areas west of the peninsula towards Mikocheni and Kawe and represents a major northern bottleneck.

The strategy to improve the northern access to meet future demand is in full alignment with the thrust of the overall Master Plan, namely to build sustainably; plan for intensive corridor of Morogoro Rd to reduce pressure on the CBD and to exploit the transport access provided by Phase 1 BRT; and lastly to avoid excessive road development especially into the existing CBD area. However, notwithstanding these goals, eventually the northern access to the CBD will need to be upgraded from a single bridge bottleneck that presently exists.

It is proposed to build a second road connection to the peninsula from the area north of Ocean Rd to by reclaiming the waterfront area east of the Selander Bridge. This tidal area forms part of the mouth of the Msimbazi River and is generally polluted and unattractive. Reclaiming this section would provide an improved link to the peninsula as well as an area for new urban development such as park and nice restaurants and shopping malls. **Figure 6.2.4** shows the area in its present state.

Figure 6.2.4 The area suitable for land reclamation alongside the Selander Bridge

The strategy to manage this development however, needs to be governed by sound planning in order not to create unwelcome side effects: namely, the increased flow of traffic into the CBD.

This development proposal is to be seen conjunction with developed public transport options and the entire northern access treatment should be sequentially managed. The following priority represents a logical and sustainable approach.

Firstly, by placing a Bus Priority lane (in the peak hours) on the bridge to improve the passenger carrying capacity of the bridge. It is possible to use existing lanes (only in the peak hours) as a shared

lane (but given priority) over the bridge or otherwise building extra two lanes on the eastern side of the bridge for southbound traffic. Developing this concept using the proposed S5 secondary bus service will improve bridge capacity for public transport, providing good modal alternatives for car commuters, and also assist mixed traffic as much Dala Dala traffic will be reduced.

Secondly, the development of a second peninsula access road on the reclaimed section which requires strict management to promote the objectives of traffic management. This would include measures such as:

- Limiting the peak hour (through traffic) use of this road to public transport and NMT with the option to redirect peninsula bus services via this route.
- Develop this route to include cycleways via this coastal route from the CBD to the Msasani peninsula.
- Extend the BRT from Kivukoni via Ocean Rd to the new development area to connect it to the BRT network.

6.2.3 Impact of later Phases of BRT on CBD

Subsequent phases of BRT will see southern and western routes from Nyerere Rd, Kilwa Rd and the TRL BRT line enters to Sokoine Drive connecting at the waterfront with the Phase 1 BRT.

It should be noted that the Gerezani Area Transport Enhancement Plan[3] is critical to connect Kilwa Rd BRT (and traffic) to the wider network and relies heavily on the use of the TRL line as a BRT corridor. If the TRL 'right to use' is not forthcoming it will require a re-examination of options to connect these BRT lines to the CBD (see more detailed discussion in Technical Report 2).

[3] A preliminary feasibility study has been prepared in as a part of the master plan study

Chapter 7 Institutional Development – The Dar es Salaam Urban Transport Authority

Institutional and capacity development will drive the long-term sustainability and conditions for the Transport Policy and System Development Master Plan and entrenches the future transport infrastructure developments in Dar es Salaam into a wider management and function-based perception of transport the City.

7.1 Structural Principles for Sustainability

To achieve viability and sustainability of the transport systems in the city, a set of structural principles are prepared:

1. A strategic policy must be set which integrates and coordinates all aspects of urban development and planning;
2. The system needs to define single responsibility and accountability;
3. Risk and responsibility must be appropriately assigned between parties (government and agency); No party should carry risk it cannot manage;
4. The responsible agency needs adequate resources (self generating revenue mechanisms or allocated budgets) to perform its task;
5. The institution needs to be involved in setting its own internal business strategy in accordance with strategic policy guidelines;
6. The necessity of a sound business model that delivers efficiency, sustainability, value for money (and integrated value-added benefits), prioritization, economic, social and environmental benefits;
7. Use of performance/outcomes-based contract to specify and document the undertakings of both parties and establish the working relationship between them. Normal contractual conditions will specify general terms and conditions while the specifications of service outlines the quantity of service, payments as well as performance indicators, and the monitoring and enforcement conditions;

8. The contract is commercially oriented in that it is fully funded to provide its services. No public service obligations or implications cloud its task and responsibilities;
9. Key Performance indicators must relate clearly to outputs and outcomes (deliverables, measurable data) as evidenced in service delivery, or outcomes (quality of life indicators) showing policy objectives are being met.

The order establishing the DART Agency addressed in detail many of above principles and outlines in considerable detail the objectives and methodologies of implementation and administration of the agency. At a higher level. DUTA will provide direction and coherence across all sectors so they operate harmoniously.

7.2 The Present Organizational Frameworks

An accepted theoretical model defines distinct and separate roles between the regulatory levels (policymaking) governing an executive strategic planning level to a management and control level which manages the operational level where services are provided. Under the present Dar es Salaam situation these levels are either nonexistent or indiscriminate as illustrated in **Figure 7.2.1**. The figure demonstrates that the role of the city has been nearly totally eliminated via a process of centralization of responsibilities to national authorities and decentralization of responsibilities to the municipal level. Furthermore, both the national and municipal authorities have regulatory and operational responsibilities for which in many cases the boundaries are unclear and / or overlap. The centralization of control and the decentralization of local functions and responsibilities (municipalities) have fragmented responsibility for transport planning and the implementation of policy. There is a lack of executive level planning or at least it is undefined where this occurs.

The establishment of the Dar es Salaam Urban Transport Authority will reinforce the executive planning level and create a representative body to coordinate and integrate efforts toward set objectives.

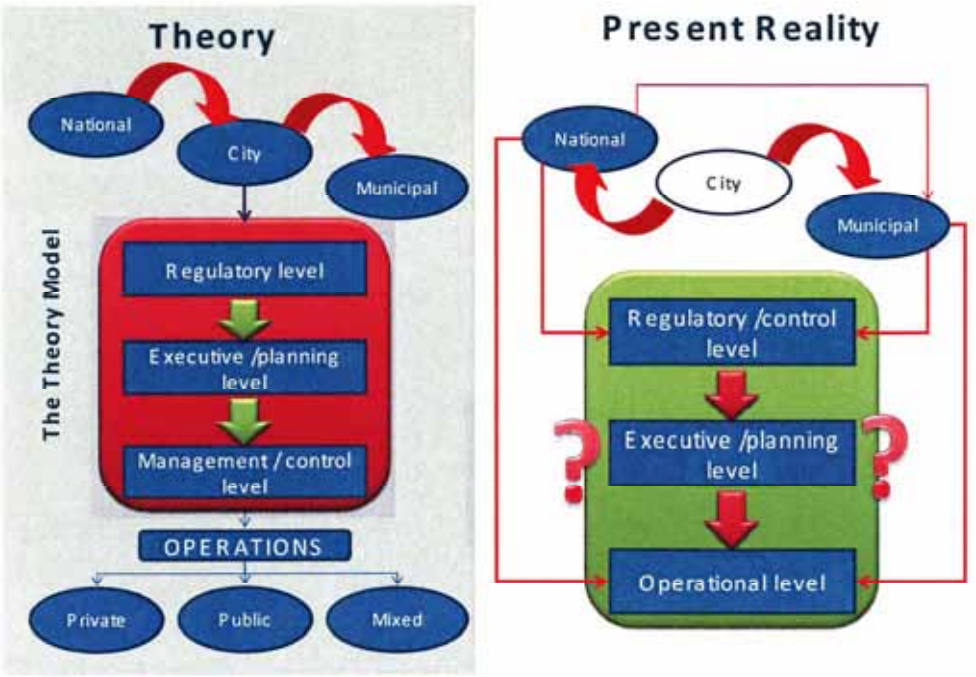


Figure 7.2.1 A phased approach: discrepancy between theory and reality

7.3 The Dar es Salaam Urban Transport Authority (DUTA)

A proposed statement of responsibility that will define the mission of the Authority and its individual Divisions (and in line with the National Transport Policy) is:

"The design, management and executive control of the urban transport system in Dar es Salaam with the objective of: providing safe, reliable, effective, efficient and fully integrated transport infrastructure; operations that best meet the needs of travel and transport; improved levels of service at lower costs; and supporting government strategies for socio-economic development whilst being economically and environmentally sustainable."

In that perspective, the role of DUTA is clearly specified, acting as intermediate and coordinating Authority between national policy and the agencies responsible management and control of city transport and its development with the obligation to:

1. *Design the best urban transport system*: DUTA will study the functioning of the transport system, identify bottlenecks and problems, and produce concrete solutions for its improvement. These solutions will inform the regulatory and policy decisions made by government and develop into Regulation supported strategic policy to the executing agencies.
2. *Coordinate all players:* DUTA will organize and coordinate all agencies responsible for service delivery by setting objectives-based strategic policy, resources and budget and overseeing at a high level that objectives are being reached.
3. *Control the urban transport system*: DUTA through its strategic coordinating role will work to guarantee the best operational conditions of the urban transport system for both system users and

service providers and for those assigned to maintain existing and / or constructing new infrastructures and / or services.

Considering the above role of DUTA, it is thus clear that DUTA is neither an executing agency nor a system operator, but is managing policy, coordination and high level control.

The general framework for the Dar es Salaam Urban Transport Authority will be structured according to the key components of good governance being transparency, accountability and this will be an important to gain the cooperation and commitment of all parties to initiate the reform process. Responsiveness and inclusiveness exercised by DUTA will address the needs, demands, hopes, and fears of all participants during the change process during preparation and implementation and are key tools to achieve transparency.

7.4 The Policy Framework of DUTA

The guiding principle for establishing DUTA is that it should directly link urban planning issues with all modes of urban transport via the formulation of a strategic urban transport policy, supported by an integrated process of transport planning and coordination.

While the Strategic policy is developed at DUTA level, the tactical policies (governing day-to-day decisions) are made at agency level so that its 'management and control' can be optimized to adapt to its operating environment. Its tactical policy however is always guided by the Strategic Policy.

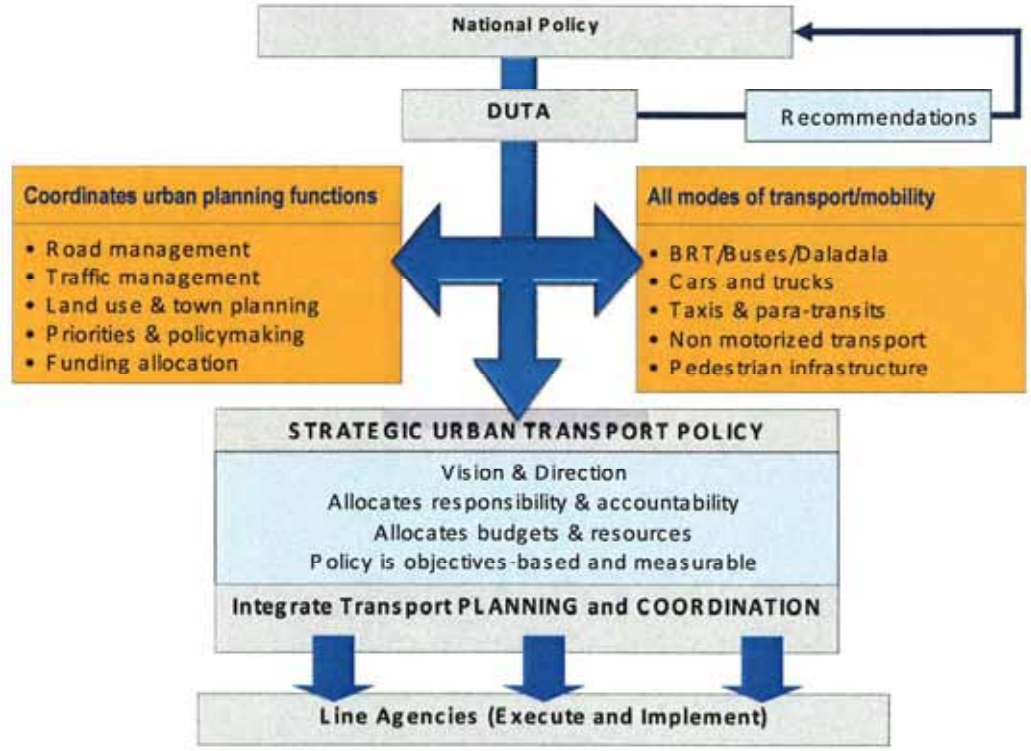


Figure 7.4.1 The role of DUTA in the policy framework

7.5 Phased Implementation

The path from an in-principal agreement to the formal establishment of the Authority is long and complex, paved with many hurdles. It is, therefore, recommended a phased approach to implement the structures DUTA and uses an inclusive and participatory approach to achieve a high sense of ownership across all those involved. By its nature the DUTA is a highly representative body working for the common good.

Three phases are foreseen in the process of establishing the DUTA:

The structural phase: where the framework is set and coordination between all stakeholders introduced. This phase involves concrete steps but does not alter the present structure and / or authority. It thus focuses on preparation and coordination.

The executive phase: initiates the process towards sustainable change. It in particular expands the coordinating role of the Board to an integrating and developing role of the new Urban Transport Authority. In this phase DUTA will also establish Planning Divisions that will manage the consolidation phase involving the line agencies in their respective areas.

The consolidation phase: the third and final phase in the process and consists in fully developing the Authority and all attached structures including supporting departments (administration/ Legal, HR & finance) and departments responsible for specific areas under the divisions. In particular it introduces and completes the structure that will allow the Authority to fully take responsibility for urban transport in Dar es Salaam by developing the planning expertise within the DUTA. It finalizes the reassignment of responsibilities amongst the agencies bring all functions under its purview.

The structural phase

This phase commences the process by the first step to improve the level of coordination between all stakeholders. Through its Executive Planning Unit it will coordinate and liaise with the existing line agencies presently responsible for transport in the city. At this stage, DUTA does not (yet) have explicit authority over the city's transport system but acts as pivoting organization to increase efficiency and effectiveness of transport operations and development.

The structure of the organization is shown in **Figure 7.5.1** showing new hierarchal structure with the existing line organizations.

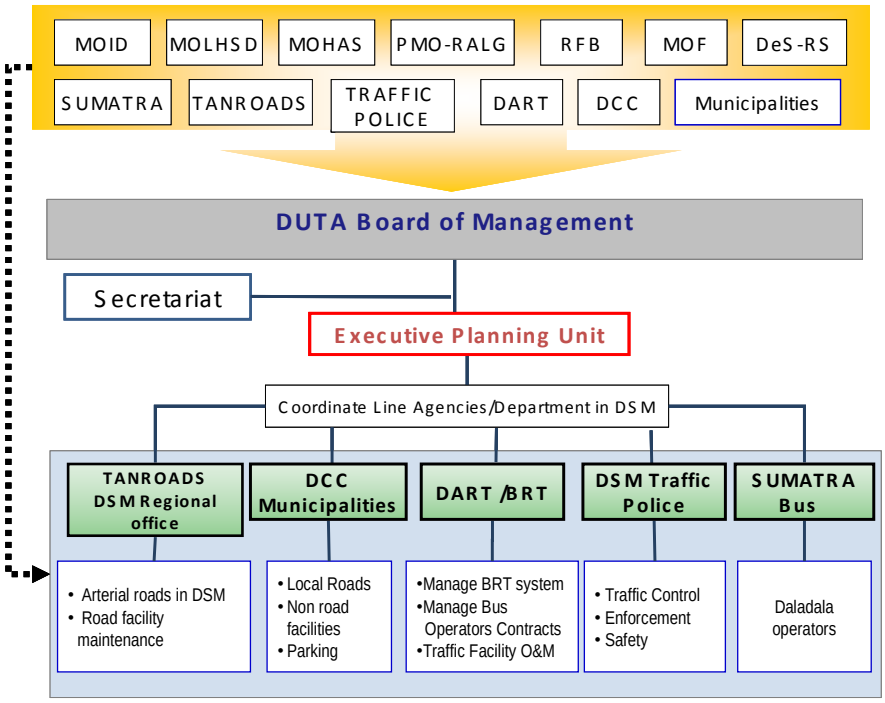


Figure 7.5.1 Establishing DUTA Board of Management (line agencies unchanged)

The concrete functions of DUTA in this stage are:

- Establish Board of Management and Secretariat;
- Set Strategic Policy and define levels responsibilities (interim & future); and
- Coordinate present players and establish liaison.

The principal activity of the Board of Management consists of streamlining, coordinating, and integrating:

- Regulatory framework for city transport;
- Strategic policy of the different stakeholders, in particular related to transport in Dar es Salaam;
- Investment planning for upgrading of existing or development of new transport infrastructures in the city;
- Infrastructure maintenance of infrastructures, including the budgeting of the maintenance programs; and
- Control and enforcement, in particular procedures related to licensing, permits, policing of traffic, safety standards, etc.

The prime objective of the DUTA Board of Management is to assemble all parties dealing with urban transport in Dar es Salaam in one coordinating unit. A key development in the structural phase is the construction of the Board of Management consisting of:

1. Representative of the Ministry of Infrastructure and Development (MOID);
2. Representative of the Prime Minister's Office - Regional Administration and Local Government Office (PMO-RALG);
3. Representative of the Ministry of Home Affairs and Security (MOHAS) also representing the Dar es Salaam police department;
4. Representative of the Ministry of Lands, Housing and Human Settlement Development (MOLHSD);
5. Representative of the Ministry of Financing (MOF);
6. Representative of Dar es Salaam City Council (DCC);
7. Representative of the Dar es Salaam Regional Secretariat (DeS-RS);
8. Three (3) representatives for each of the municipalities: Kinondoni, Ilala and Temeke;
9. Representative of TANROADS;
10. Representative of SUMATRA; and
11. Representative of DART.

The executive phase

In the second phase, the Authority is formally established with its own planning divisions. DUTA will be the executioner of the decisions taken by the Board and will gradually grow towards a truly functioning entity and prepares the field for a fully functional Authority.

Parallel with its own internal structural and organizational development, DUTA will become increasingly involved in the restructuring of the external and existing line agencies under the new structures.

Internally its role and responsibility in this phase will include:

- Create the management organization within the authority
- Establish the administration;
- Develop integrated planning functions according to modal / functional responsibilities including 3 key planning divisions;
- Commence reassignment of responsibility & creation of any new agencies. Particularly this will include a new Roads and traffic Agency that will take over the responsibility for local urban roads from the Regional TANROADS office, the DART traffic responsibilities and negotiate roles and functions with local municipalities.
- Develop strategic policy for each agency within the overall strategic policy; and
- Develop budget plans.

Externally DUTA will:

- Streamline and integrate the activities of SUMATRA and DART in respect to public transport;
- Streamline and integrate the activities of TANROADS and the Municipalities in respect to road traffic;
- Streamline and integrate the remaining stakeholders that are involved in city transport, traffic management, infrastructure development, etc.

The executive phase will see DUTA develop 3 (key) Divisions, which combined "characterize" the urban transport system in Dar es Salaam. These Divisions will respectively be dealing with:

- Public transport, in particular BRT but also all other modes providing public transport services;
- Non-public transport, including all roads and traffic and all forms of non-public transport such as non-motorized transport, all municipal and trunk roads as well as management of equipments such as signalling;
- Transport development, focusing the optimal realization of development projects via a thorough and prioritized investment planning.

The role of each division and sub-departments is described as follows:

Public Transport Division is responsible for all public transport in Dar es Salaam with departments for:

- Bus Rapid Transport (BRT) Department (DART)
- Private Services Department (for private operators not under contract)
- Consumer Service Department - general public can obtain information and lodge complaints
- Transit Department is responsible for public transport service improvement and development in the city.

Road & Traffic Infrastructure Division is responsible for all city traffic, including control systems and infrastructure with departments for:

- Research Department to collect, collate and develop information.
- Licensing and Registration Department for issuing licenses and permits to provide (public) transport services within city boundaries and for managing vehicle registration.
- Roads and Traffic Department will oversee the agency responsible for non-public transport and traffic.

Project Planning Division is responsible for the integrated, coordinated, and structured development of the city's transport infrastructure with departments for:

- Planning Department, and
- Budgeting Department

The internal establishment of departments during the executive phase is shown in **Figure 7.5.2** and the external restructuring of line agencies will resemble that shown in **Figure 7.5.3**.

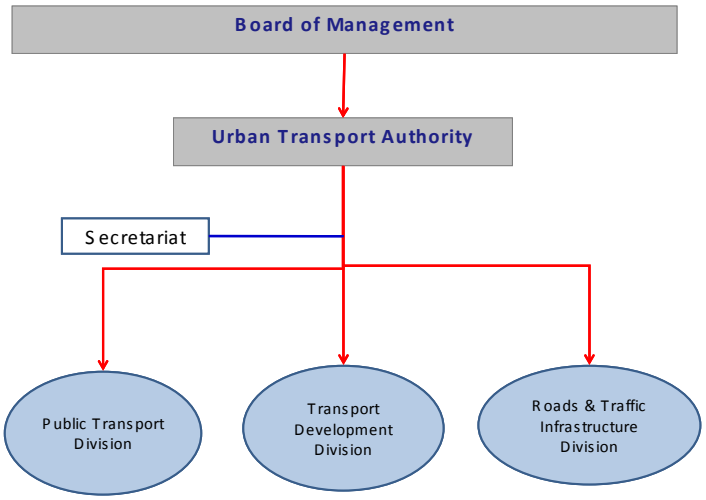


Figure 7.5.2 Establish 3 key divisions

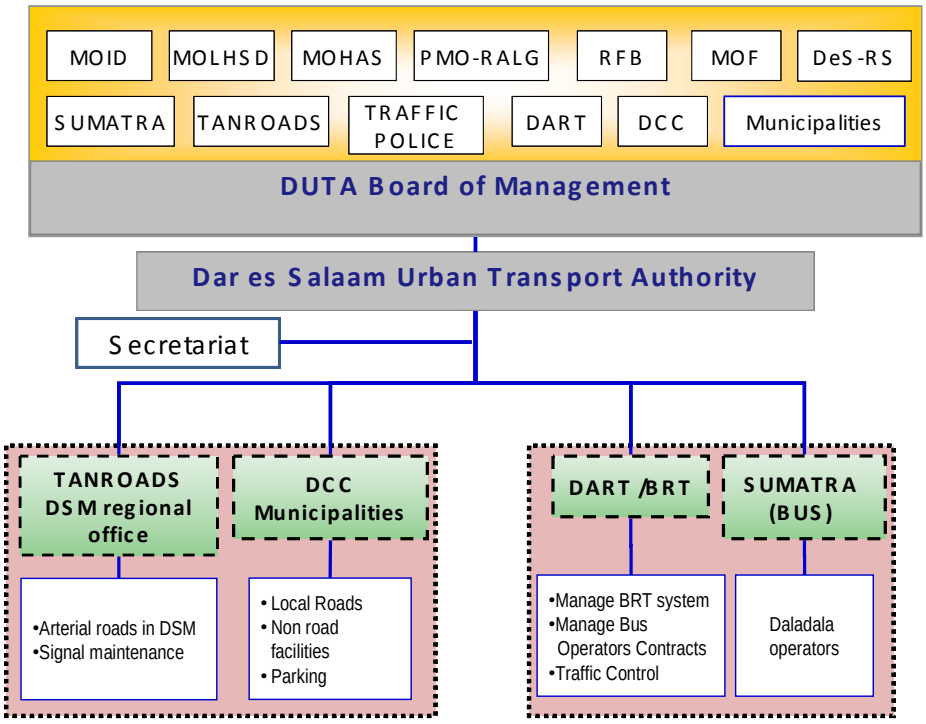


Figure 7.5.3 Commence restructuring line organizations

The consolidation phase

In the third and final stage, the theoretical model has been implemented by the alignment of all existing line agencies and the creation of new ones where necessary. In the third phase DUTA will now:

- Complete the reorganization of the line agencies and fully reassign responsibilities to these agencies

- Establish an Advisory Board for all stakeholders not represented at Board level
- Finalize organization of internal administration including establishing support departments consisting of Administration/ legal; Human resources; and the financial department.

Once these tasks completed, the DUTA will have been fully established as the sole Authority for transport in the city of Dar es Salaam.

It should be noted that the time frame for implementation is not specified as this will depend substantially on the commitment and cooperation of all concerned parties through and inclusive and participatory approach. However the three phases could be expected to cover an 18-24 month time frame, given commitment on all sides.

The full outline of a completed DUTA structure and where it sits in the framework is shown in **Figure 7.5.4**.

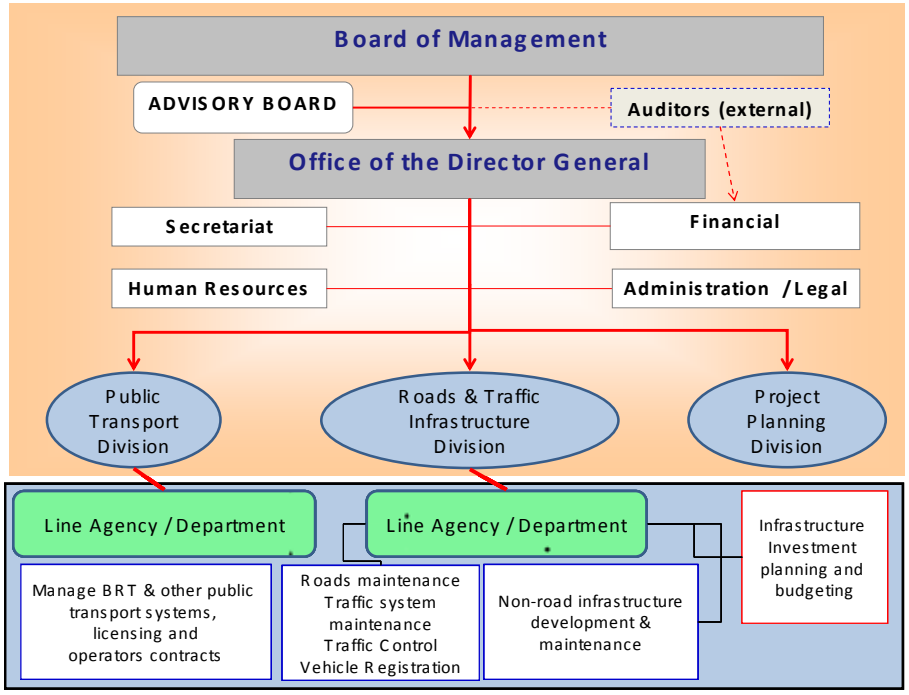


Figure 7.5.4 Final generic structure of DUTA in the context of transport oversight

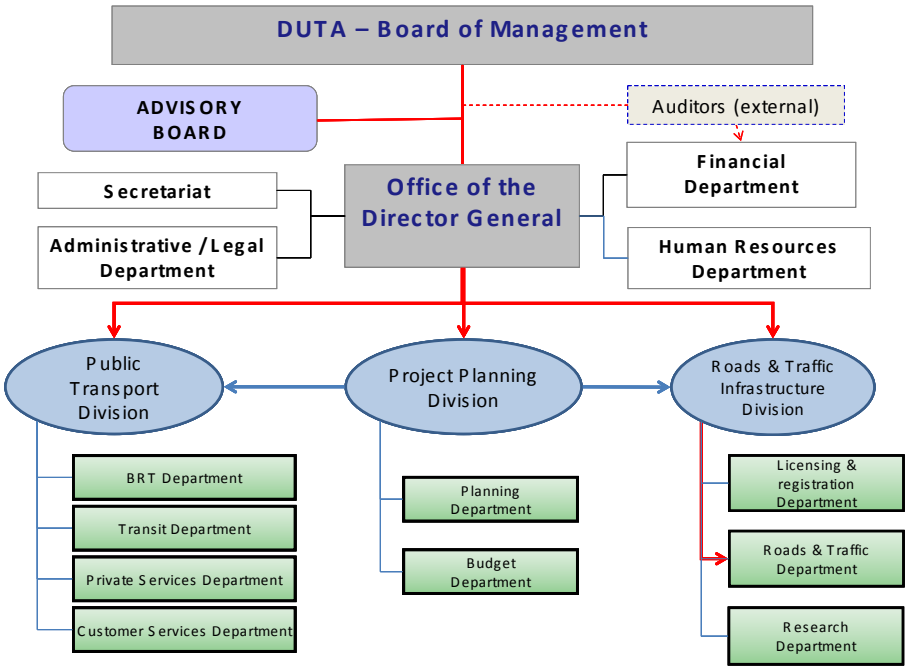


Figure 7.5.5 Operational Structure of DUTA at the final stage

7.6 Implementation

The change process requires commitment, goodwill and cooperation at all levels to produce mutual benefits for all concerned. This difficult process s a learning curve and mistakes will be made. To reduce the difficulties four key issues are identified:

1. Expertise: available expertise in the different public authorities involved should be utilized and future need for outside expertise a-priory accepted;

2. Budget: financial implications of introducing DUTA should be acknowledged and necessary budgets foreseen, not only for the capital investments but also for long-term operations;

3. Accountability & transparency: is a critical component to ensure efficiency and effectiveness of DUTA. Processes should be integrated in DUTA policy according to which DUTA members are accountable. Accountability can only work if this concept is accompanied by financial, managerial, and operational transparency with complete insight in the policy-making processes; and

4. Control: an effective control structure has to be established from the beginning to ensure that the efforts of creating DUTA does not remain a paper-based effort but has real authority to act under controlled conditions.

Technical Report Volume 3 (Chapter 7) outlines the function and operation of the DART agency, demonstrating its functions and level of system control.

Chapter 8 Capacity Development

8.1 Introduction

8.1.1 What is Capacity Development?

For the last decades, Tanzania has received significant flows of technical cooperation, much of which aimed at supporting institution building and/or formulating the legal framework. While these changes have been accomplished, there still have remained problems, which lags behind the targeted outcome. Accordingly, a broad consensus has been achieved among development practitioners that a 'capable government', able to perform key functions effectively, is a precondition for development. Thus, capacity development analysis and strategies remain focused on the public sector.

Although there is no agreement on what is capacity development, the following definition made by UNDP covers a board concept of capacity development.

Capacity development is defined as the abilities of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner. Capacity development is the process through which these abilities are obtained, strengthened, adapted and maintained and managed over time, especially in the public sector in order to reduce poverty, enhance self-reliance, and improve people's lives.

Capacity development is meant to become, therefore, a broader concept than that of human resource development or than institutional development.

8.1.2 Contents of this Chapter

As UNDP's definition on capacity development indicates, capacity can/should be developed at all levels: institutional, organizational and individual level. While the institutional and organizational issues are discussed and addressed by proposing establishment of Urban Transport Authority, the discussion in this Chapter limits to that of individual capacity. Based on the development discourse review and interviews with the officials, the capacity gap is analyzed and addressed by proposing establishment of the Centre for Transport Studies as one of the measures to build the individual capacity in the field of transport planning and administration.

8.2 Capacity Gap Analysis

8.2.1 Development Discourse Review

The Government of the United Republic of Tanzania through the Ministry of Infrastructure Development has prepared the National Transport Policy in 2003. A mission of the Government is clearly stated in the Policy Paper that emphasizes the importance of developing a safe, reliable, effective, efficient and fully integrated transport infrastructure and operation in the country.

Soon after the National Transport Policy was officially approved, the Government has developed the detailed implementation strategies to translate the National Transport Policy into time bound actions and activities. Accordingly, and numerical strategic target has been set. Necessary activities to achieve the target within the set time frames have been identified. The implementation strategies, following to the Policy Paper, not only discusses five major areas, including road, rail, port, and air, but also discusses the urban transport as one of the cross cutting issues.

MOID is now expected to become a focal point for coordinating development of transport sector at the national level and limit her role to policy formulation and absorb the programme management cycle, including strategic planning, monitoring and evaluation. At the regional level, PMO-RALG is expected to take a role in enhancing capacity of Urban Authority to effectively coordinate urban transport management issues through strengthening transport- planning function of major urban authorities by forming transport planning unit.

Table 8.2.1 Policy Direction and Responsibilities (for example)

Policy Direction	Target	Strategies	Implementing Actors	Indicators
Limit the role of MOID to policy formulation, strategic planning, monitoring, evaluation and coordination	Have in place and effective Ministry by 2008	- Delegate regulatory function to relevant autonomous agencies, i.e., SUMATRA; - MOID be a focal point for coordinating development of transport sector; - Further restructuring of the MOID to have its functions more precisely defined and focused.	PO-CDS MOID MPP	MOID activities streamlined
Enhance capacity of Urban Authority to effectively coordinate urban transport management issues	Strengthen transport-planning function of major urban authorities by forming transport planning unit with requisite planning and logistic personnel by 2012	- Strengthen urban transport management committees - Strengthen transport database management - Conduct training on transport planning and infrastructure management - Conduct necessary transport researches and evaluations	PMO-RALG MOID	Coordinate infrastructure and service provision, Functioning of urban transport management committees, Quality of transport data, Infrastructure management system

Source: Prepared by JICA Study Team based on MOID (2004)

The transport sector in Tanzania, regardless of these effort at the policy level, is still characterized by high cost, low quality services due to various reasons including poor infrastructure maintenance and rehabilitation, inadequate institutional arrangements/legal framework and procedures which are not consistent or compatible to create conducive climate for investment, inadequate capacity in human and financial resources, and lack of law enforcement of safety and environment.

The deteriorated state of the transport sector coupled with unsatisfactory operational performance signifies another fundamental characteristic of the sector. This problem has been stalling the progress of the various development programmes. The following persistent weaknesses in the development and management of the sector have been identified in the said National Transport Policy and should be addressed by filling the capacity gap in the transport sector.

i) Lack of coherent policy guidance to those concerned with the planning and development of the transport sector leading to non-coherent plans and programmes;

ii) Inadequate coordination and consultation among stakeholders;

iii) Shortage of trained and experienced personnel in the transport planning departments and units.

iv) Lack of managerial capacity in public enterprises; under capitalization of such enterprises and absence of competition;

v) Lack of regulatory regimes equipped to enhance competition, fair operational practices and complementarily of services; and

vi) Insufficient dialogue between the public and private sector due to poorly developed service providers as well as service users or consumer associations.

8.2.2 Stakeholder Consultation

The secondary material, including such development discourse as National Transport Policy, may not tell the issues in depth. Accordingly, following to the literature review, the interview was conducted to identify the capacity gap in the urban transport sector. Based on interviews with the relevant officials, the major deficits in capacity in the urban transport sector were identified and is listed as below.

- Lack of commitment of decision makers
- Lack of human and financial resources
- Poor coordination and no clear-cut responsibilities
- No clear benchmark (i.e., baseline data) for planning and budgeting
- Lack of accountability
- Control exercises by central government and less self-reliance of local governments
- Inactive lines of communication

- Lack of incentives
- Lack of clear standards/manuals and reliable database (ad-hoc solution)
- Poor regulatory framework
- Lack of experience/good practice
- No scaling-up mechanism to other cities

The detailed discussion and minutes of the meetings with the officials can be found in the Technical Report of the Final Report.

8.2.3 Lessons Leant from Past Experience

Dar es Salaam has received significant flows of technical cooperation resources, much of which aimed at supporting the project implementation associated with institution-building and/or human resource development. The following discussion reveals lessons from the past development programme/project supported by the donor agency. Lessons learnt from the programme are listed below.

- There is a need for a central technical coordinating unit, to be led by technically informed professionals. For sustainability purposes, such unit should be anchored in the relevant office of the central government, with mandate and budget for providing the needed technical support to local authorities;
- There is a need to let the processes take the time they require rather than rushing to physical results as it has been the case in some of the programmes;
- Sensitization and mobilization of stakeholders should be continuous;
- A committed, motivated and technically informed leadership is instrumental. This is primarily because the all the transformation process involves sensitization, mobilization and participation of stakeholders which necessarily takes more time than the traditional and bureaucratic planning and management processes;
- Monitoring and documentation of the process should commence on day one, lest the rich experiences are lost with the consequences of, inter alia, repeating mistakes;
- Capacity building should emphasize learning by doing, rather than classroom type of training;
- Over reliance on donor funding for implementing the action plans may undermine local initiatives in environmental improvement and social capital in some communities;
- Involvement of relevant training institutions in the programmes right from the beginning with ensure capacity building and sustainable technical support;
- Regular consultations at municipal and ward levels provides stakeholders opportunity to share information, monitoring progress made in the programme, review priorities and rectify the course of action;

- Environmental profiling and consultation at ward level widens stakeholders participation.
- Active involvement of the communities is indispensable for sustainable planning and implementation of community upgrading programmes and to ensure a sense of community ownership of the infrastructure and services.
- The community including civil society organizations should be closely and meaningfully involved in design, implementation, operation and maintenance, even where a community-based organization should champion infrastructure projects.
- Ensure that roles and responsibilities of local government and the community based organizations are clearly defined.
- Intensive training and long-term technical support are indispensable if a community based organization is to play an important role in the project.
- Community mobilization should preferably target specific zones or housing clusters and groups in the community by using a wide range of tailor made tools and methods such as community planning team.
- Collection of community contributions and fees should preferably be done through existing legally approved mechanisms to avoid large scale default without sanction.
- Use of labour-based technology and community contracts provide opportunities for development of local skills and employment creation, both having positive implications for sustainability of infrastructure.
- Budgets (both time and money) for community mobilization and training should be strictly defined and monitored to avoid delays and excessive costs in relation to the project outputs envisaged.
- It is critical to document and share program experiences nationally and regionally. This has led to the project being recognized as a best practice in safety and security sector within the international community.
- It is essential to enter into creative partnerships and networking arrangements with other stakeholders (development partners, international agencies, research and academic institutions among others) but with a clear and strong local and national leadership in place. This was well exemplified by presence of a consistent and strong local team and support from the local governments.
- Collaboration with national police and local security agencies has led to significant reduction in crime and fear of crime.
- It is important to develop a consultative framework that encourages and ensures continuous and predictable engagement of all key stakeholders.
- For a programme to be sustainable and to go to scale, it is fundamental that it is fully

mainstreamed within both national and local authority frameworks (staffing, budgeting, administrative support and coordination).

- Supporting and understanding locally identified felt needs in key to success of an initiative. For example, strengthening the Ward Tribunes has had remarkable impact on the work and image of the project.
- It is possible to move from pilot project to national programme as long as one can clearly demonstrate successes from the pilot phase. It is critical that all key actors at all the levels are fully appraised of the success and challenges.

8.3 Centre for Transport Studies to Fulfill the Capacity Gap

A focal issue, which will have to continue to be pursued to counter some of the problems, raised in 2003 National Transport Policy, is non-application of scientifically based planning methodologies fitting our environment coupled with non-existent data systems. In many countries, the academic and training institutions play a vital role in development of the comprehensive planning tools and provision of the skillful workforce. However, the capacity of academic and training institution in Tanzania is limited, which lags behind in strengthening transport database management, conducting training on transport planning and infrastructure management, and conducting necessary transport researches and evaluations. In order to strengthen transport-planning function of major urban authorities, there is a growing need to establish the focal point for the transport studies in the field of transport planning, utilizing the transport database and traffic demand model to be developed by JICA.

Also, the National Transport Policy and Strategy Papers emphasizes the importance to enhance the institutional capacity of the concerning authority to effectively coordinate urban transport management issues. The target is set to strengthen transport-planning function of major urban authorities by forming transport planning unit with requisite planning and logistic personnel by 2012, which is considered consistent with the idea of this Centre.

Accordingly, establishment of the National Centre for Transport Studies (NCTS) was proposed in the Progress Report of this Study, which becomes a focal point of the capacity building training institution. A preliminary study on capacity development identifies that the capacity of academic and training institution is limited, which lags behind in strengthening transport database management, conducting training on transport planning and infrastructure management, and conducting necessary transport researches and evaluations. In order to strengthen transport-planning function of major urban authorities, there is a growing need for the capacity building of the academic institutions in the field of transport planning, utilizing the transport database and traffic demand model to be developed by JICA.

8.3.1 Progress on National Centre for Transport Studies

Steering Committee for this Study was held on 24 July, 2007 and confirmed the importance of the Centre for Transport Studies. All the members of the Steering Committee agreed with the National

Institute of Transport to absorb such a function of the center. Following the Steering Committee, Stakeholders' Consultative Meeting was hosted by the National Institute of Transport on 3 August and participated by the stakeholders from the Ministries and Local Government. This meeting confirmed the need for technical assistance from external agencies and prepared a draft application for same, through further consultations among the stakeholders. Stakeholders Consultative Meeting was once again held on 8 August and reviewed the draft application form for Japanese technical assistance, which was subsequently submitted to the MOID. At the Steering Committee on 4 December, JICA Official has confirmed the receipt of the application for technical assistance and that this application is under consideration at JICA HQ.

Box: Overall progress and activities towards National Centre for Transport Studies in 2007

July	Steering Committee Meeting (24/July)
Aug	Stakeholder Consultative Meeting (3/Aug)
	- Draft Roll-out Plan
	Stakeholder Consultative Meeting (8/Aug)
	- Finalize and submit application form to JICA through MOF
Sep	NIT staff enrolled in short term training in Japan.
	NIT staff enrolled for MSc in Urban Planning at Ardhi University.
	NIT accommodates an office and equipments for CTS.
Dec	NIT requested JICA to co-host the technical seminar in Feb.

8.3.2 Roll-out Plan for National Centre for Transport Studies

(1) Experiences in Philippines

The best practice of the Centre for Transport Studies is observed in the exercise in Philippines. The National Centre for Transport Studies in Philippines was established in the following stages.

Transport Training Center (1976 – 1992)

(i) Period during the Management by the Ministry of Public Works, Transportation and Communications (MPWTC) and the University of the Philippines (UP), 1976-1980

The Transport Training Center (TTC) was created as a special unit attached to the University of the Philippines System by virtue of Letter of Instructions No. 428 dated 12 July 1976. The Center was tasked to upgrade the capability of government personnel concerned with transportation through intensive and practical training in the fields of traffic engineering, planning and management. Subsequently, Presidential Decree No. 1295 dated 28 January 1978 placed the Center under the umbrella of the National Engineering Center of the University of the Philippines.

(ii) Period during the Management by the Ministry of Transportation and Communications (MOTC) and the University of the Philippines (UP), 1980-1987

On 11 November 1980, President Marcos issued LOI No. 1080 superseding LOI No. 428. It reiterated the need for well-trained transportation personnel and expanded the functions of the Center to include transportation research. Other pertinent provisions of LOI 1080 are the reorganization of the TTC Steering Committee into the Advisory Committee, chaired by the Minister of Transportation and Communications with members from the Ministries of Transportation and Communications, Public Highways and Public Works, the National Economic and Development Authority, the University of the Philippines, and the Constabulary Highway Patrol Group; and the transfer of the responsibility for providing the TTC Budget from the Ministry of Public Highways to the Ministry of Transportation and Communications starting calendar year 1982.

Institution of the Center as a Regular Unit of the University of the Philippines (UP), 1993

On 2 July 1993, Presidential Executive Order No. 105 was signed by President Fidel V. Ramos integrating the Center into UP as one of its regular units. The UP Board of Regents approved the remaining and restructuring of the Center, which form part of the commitment of UP under the Technical Cooperation Program with the Japanese Government. The Center has expanded its building and its name has been changed to National Center for Transportation Studies (NCTS). In addition to its regular training programs, the Center now conducts research in the various fields of transportation and administers graduate programs in transportation.

The Center has been accredited as a training institute by the Civil Service Commission in 1995 and as a CPE provider by the Professional Regulation Commission in 1997.

NCTS Project (1992-1997)

A Record of Discussions outlining the five-year technical cooperation program to be granted by the Government of Japan through the Japan International Cooperation Agency (JICA) was formalized in January 10, 1992.

The duration of the JICA technical cooperation was five (5) years, starting from April 1992 until March 1997. A Japanese mission arrived in November 1996 for the final evaluation of the Project. The objectives of the Project was evaluated to have been successfully achieved and continuation of the Project was favorably endorsed. Thus, an extension of two years, commencing on April 1997 until March 1999, was granted by the Japanese Government.

The NCTS Project was formally closed on March 31, 1999 letting the Center to stand on its own. However, close academic ties with Japanese professors/experts are still maintained through the continued dispatch of visiting professors/experts by JICA.

NCTS after the end of the Japanese Technical Cooperation (1999 – present)

After the project was formally closed in March 1999, an Advisory Committee (ADCOM) with the same function was created to replace the Joint Committee.

(2) Roll-out Plan for National Centre for Transport Studies

In a close consultation with the Ministry of Infrastructure Development and collaboration with other academic institutions, a consensus has been made on the agenda of NCTS, which includes strengthening transport database management, conducting training on transport planning and infrastructure management, and conducting necessary transport researches and evaluations, so as to enhance the institutional capacity of the concerning authority to effectively coordinate urban transport management issues. It is also agreed with the following phases necessary to be accomplished to establish NCTS.

Phase 1: Transport Training Centre

The Transport Training Centre will be initially created as a special unit attached to the existing academic and/or institutions. The Centre will be tasked to upgrade the capacity of, mainly, government personnel concerned with transport through intensive and practical training in the fields of traffic engineering, planning and management.

Phase 2: Department of Transport Planning

The Department of Transport Planning will be established and expand the functions of the Centre to include transportation research. The Department will also offer the students the bachelor degree programme.

Phase 3: National Centre for Transport Studies

NCTS will be developed to a more independent body that strengthens both training and research functions. The Centre will conduct researches and consultancy works in the various fields of transportation and administers graduate programs in transportation.

The following table shows the possible units taught in the Centre compared to the unit available at the candidate institutions and indicates a lack of transport modeling and planning expertise. When establishing such a Centre, the initial step of the capacity development plan should focus on the provision of expertise of transport modeling and planning, which may be accomplished through, for instance, the train-the-trainers programme at the candidate institutions.

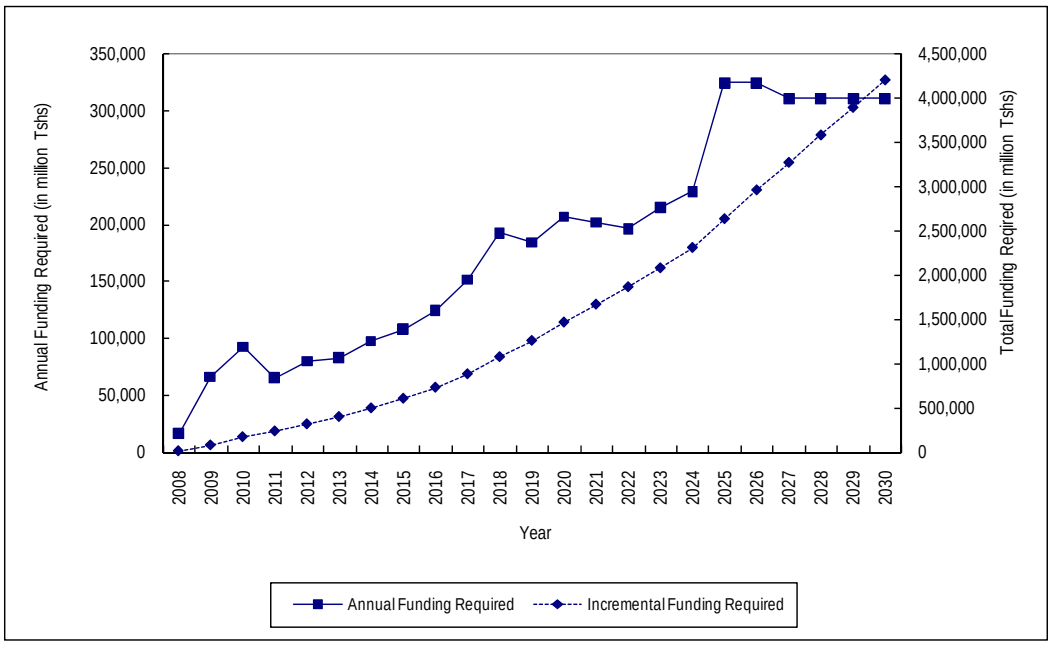
Necessary inputs to establish the National Centre for Transport Studies, including the organization structure, staffing, and budgeting are discussed by phasing in the Technical Report.

Chapter 9 Financing Strategy

This Chapter discusses the possible funding sources for implementation of the Urban Transport Policy and System Development Master Plan. The discussion starts with the estimated costs for the master plan implementation, the forecast of revenue and expenditure at the national level, the possible new funding generation scheme such as development tax, Tax Incremental Financing (TIF), and some schemes available by the public and private partnership. It is important to emphasize that this chapter does not intends to present the blue sky of the new revenue generation scheme but to show the basic requirement for the implementation of the schemes.

9.1 Funding requirement for the Master Plan implementation

The master plan study estimates the total cost of the road development plan as 4,209,932 Million Tshs (3,312 Million US dollars) that will be implemented in the next 20 years (refer to **Figure 9.1.1**).



Source: Study Team

Figure 9.1.1 Total Cost of the Master Plan

The detail of the project costs is shown in **Table 9.1.1**. As the table shows, The project cost for expressway is dominant, which costs 2,256,059 million Tshs in total.

Table 9.1.1 Master Plan Projects

Project No.	Project Name	Road Classification	Project Length (km)	Project Cost (MTshs)
101	New Bagamoyo Road Widening	1	17.0	81,371
102	Nelson Mandela Road Widening	1	12.9	59,290
103	Kigamboni Bridge and Access Road Improvement	1	8.1	130,116
104A	Inner Ring Road/Kawawa Road Development	1	3.6	16,882
104B	Inner Ring Road/Kawawa Road Development	1	2.8	6,339
105	Nyerere Road Widening	1	15.1	51,128
106	Outer Ring Road Development	1/2	30.3	91,120
107	BRT Phase 1 Corridor and Road Development	3	9.4	11,635
108	BRT Phase 1 Corridor and Road Development	2	5.4	21,743
109A	Gerezani Area Transport Enhancement	1	15.8	33,121
109B	Gerezani Area Transport Enhancement	1	2.6	5,973
110	Selander Bridge Bypass	2	7.2	30,411
111	Kigamboni Corridor Road Development	2	8.4	20,990
112	Tabata BRT Development	5	15.5	106,390
113	Flyover Installation	1	0.0	78,048
114	CBD Traffic Management	1/2/3	0.0	2,792
115A	Expressway (Wazo-Sam Nujoma)	4	17.8	50,545
115B	Expressway (Wazo-Sam Nujoma)	3	3.2	4,009
116	Expressway (Sam Nujoma-Airport)	4	21.8	2,047,993
117	Expressway (Sam Nujoma-Airport)	2	3.1	9,075
118	Expressway (Sam Nujoma-Airport)	2	3.4	9,776
119	Expressway (Airport-Kigamboni)	4	19.4	55,193
120	Mikocheni Road Widening	2	3.1	6,457
121	Haile Selassie Street Widening	2	5.0	10,666
122	Old Bagamoyo Road Widening	2	7.7	19,470
123	Mwinyjuma Road Widening	2	8.0	22,270
124	Shekilango Road Widening	2	5.3	19,183
125A	Kigamboni Road Development 7	1	16.0	69,008
125B	Kigamboni Road Development 8	1	8.1	25,743
126	United Nations Road Widening	2	3.7	7,839
127	Morogoro Road Bypass (North)	2	6.8	19,922
128	Morogoro Road Bypass (South)	2	5.8	17,497
129	Uhuru Street Widening	2	7.5	16,078
130	Kimanga/Tabata Road Widening	2	4.5	9,443
131	Tabata Road Development	2	6.6	19,236
132	Changombe/Tandika Road Widening	2	4.3	10,019
133	Mbagala/Tandika Road Widening	2	3.5	11,044
134	Mbagala Road Widening	2	7.0	14,555
135	Sam Nujoma Road Extension	2	2.6	5,426
136	Kibada Road Widening	2	26.1	61,154

Project No.	Project Name	Road Classification	Project Length (km)	Project Cost (MTshs)
137	Kigamboni Road Widening	1/2	18.8	46,748
138	Kigamboni Road Development 1	2	1.7	3,594
139	Kigamboni Road Development 2	2	3.4	9,782
140	Kigamboni Road Development 3	2	4.5	9,326
141	Kigamboni Road Development 4	2	6.6	13,765
142	Kigamboni Road Development 5	2	6.4	18,670
143	Kigamboni Road Development 6	1	12.0	34,352
144	Vijibweni Road Widening/Development	1	5.7	16,564
145A	New Bagamoyo Road Extension	1	4.9	17,083
145B	New Bagamoyo Road Extension	1	8.8	23,470
146	Upanda Road Improvement	2	1.7	6,070
148	Msasani Area Road Improvement	3	1.8	2,274
149	Regent Area Road Development	3	12.2	16,346
150	Old Bagamoyo Road Extension	3	12.7	18,335
151	Kinondoni Regional Road Development	3	104.0	131,164
152	Kinondoni Regional Road Development 2	3	53.7	70,289
153	Ilala Regional Road Development	3	75.3	98,238
154	Ilala Regional Road Development 2	3	27.3	36,364
155	Temeke Regional Road Development	3	93.2	119,057
156	Temeke Regional Road Development 2	3	47.7	64,100
157	Temeke Regional Road Development 3	3	23.8	32,002
158	Corridor and Road Development 3	3	24.0	33,588
159	Tandika Area Road Improvement	3	17.5	25,512
160	Industrial Area Road Improvement	3	7.2	8,861
161	Tabata Area Road Improvement	3	4.5	6,892
162	Flyover Installation (Phase2)	1	0.0	58,536
Total			933.7	4,209,932

Note: The number of road classification indicates; 1: PrimaryRoad, 2: Secondary Road, 3: Tertiary Road, 4: Expressway, and 5: Others (Tabata BRT Development, dedicated for BRT).

Source: JICA Study Team

On the other hand state's budget for the transport sector and that of the Dar es Salaam City are limited as shown in **Table 9.1.2** and **Table 9.1.3**. Although income of the Road Fund is expected to rise[1], still that income is not considered sufficient as the fund for new projects. It is essential to consider external sources, especially private investment and new revenue generation scheme.

[1] Section 9.3 Road Funds in this Chapter

Table 9.1.2 Financing for transport sector 2001-2006

in TSHs million

Sub-sector	2001/02	2002/03	2003/04	2004/05	2005/06	TOTAL	Share
Roads*	154,200.00	210,610.00	218,500.00	276,030.00	359,090.00	1,218,430.00	82.1%
Railways	44,920.00	7,478.40	8,661.10	20,341.80	26,502.00	107,903.30	7.3%
Airports	1,943.10	12,826.00	11,018.20	42,925.60	3,983.50	72,696.40	4.9%
Ports	14,470.00	8,460.00	12,931.00	24,267.00	25,325.00	85,453.00	5.8%
GRAND TOTAL	**215,533.10**	**239,374.40**	**251,110.30**	**363,564.40**	**414,900.50**	**1,484,482.70**	**100%**

Source MOID
*The amount does not include what was spent on local government roads.

Table 9.1.3 Dar es Salaam City Council Revenue Collection during 2000 - 2002

No	Source	2000	2001	2002
1	Development Levy	1,425,596,350.00	1,768,869,180.00	1,786,080,860.00
2	Bus Stand Fees	314,482,230.00	454,111,094.00	479,127,957.00
3	Parking Fees	151,048,210.00	185,781,237.80	159,209,200.75
4	City Service Levy	106,143,976.00	137,749,739.00	89,436,579.59
5	Dividends from Shares	81,630,000.00	150,100,000.00	232,867,500.00
6	Hiring of City Buildings and Conferences	10,944,500.00	29,248,000.00	19,742,500.00
7	Solid Waste Disposal	47,570,977.00	80,226,796.00	83,831,668.75
8	City Bus Licensing Fees	71,231,412.72	82,909,408.00	724,940.00
9	Hiring of Plants and Vehicles	14,669,783.48	29,702,350.00	33,777,000.00
10	Others	172,589,175.60	140,573,984.20	126,925,161.00
	Total	2,395,906,614.80	3,059,271,789.00	3,011,723,367.09

Source: City Treasure, Five Year Strategic Plan for Year 2004/05 - 2008/09, Dar es Salaam City Council

9.2 National Mid-Term Plan and Budget Framework

Medium Term Plan and Budget Framework and Transport Sector Investment Programme (TSIP) clearly reflect the government policy to place priority on the development of transport infrastructure.

Adequate transport infrastructure and services are key factors in Tanzania's efforts to promote growth and reduce poverty, as described in the MKUKUTA - the National Strategy for Growth and Reduction of Poverty (June 2005). The MKUKUTA gives emphasis to increasing accessibility to economic and social services. This not only promotes economic growth, but also improves the physical links between people and services. This can lead to a direct improvement in well being of the people through better access to health, education and other economic services. In rural areas, the MKUKUTA emphasizes agricultural development, because agriculture remains the dominant sector in the economy. It accounts for over 48% of the Gross Domestic Product; 80% of employment and 55% of total foreign exchange earnings of the country. However, the agricultural sector is characterized by low productivity. As the majority of poor people lives in the periphery areas of the country in the rural areas and is engaged in agriculture, unlocking the country's potential for rural development is seen as the key to making a substantial impact on poverty reduction.[2]

[2] 10 YEAR TRANSPORT SECTOR INVESTMENT PROGRAMME (TSIP) PHASE I 2007/08 – 2011/12, Jan 2007,

As the national transport policy, TSIP also mentions that maintenance has priority above improvement. For this purpose, the national budget for 2007/08 has increased the road related funds, Excise duty on petrol and diesel, Fuel levy and Motor vehicle registration and transfer tax. However, soon after the implementation of the revised rate, the arguments for increase of bus fare and the worries for inflation started to occur. This issue needs be carefully watched.

Some of the operational targets for promoting sustainable and broad-based growth in MUKUKUTA (NSGRP) are:

- Accelerated GDP growth rated to attain a growth rate of 6-8% per annum by 2010
- Increased growth of manufacturing sector from 8.6% to 15% by 2010
- Increased agricultural growth from 5% in 2002/2003 to 10% by 2010
- Scaled up participation of the informal sector and SMEs (including cooperatives)
- Increased export promotion of value added minerals from the current 0.5% to 3.0% by 2010

The Central Government has two primary budget resources, which are domestic revenue and external assistance. Domestic revenue accounted for half of the central government total revenue in 2005/06, and tax revenue is the major source. Tax revenues are collected by the Tanzania Revenue Authority (TRA), an executive agency under the Ministry of Finance that was established in 1996. The TRA is mandated to collect major taxes including Income Tax, VAT, Import Duty and Excise Duty. Non-Tax Revenue, which accounted for 8% of the total central government revenues in 2003/04, comprised of fees, levies and dividends etc. and is collected by the Ministry of Finance and other Central Government Ministries.

External Assistance is the second major avenue of resources for the Central Government's budget, which accounted for approximately 41% of the Government's resource envelop. The overall strategy guiding effective management of external assistance is outlined in the Tanzania Assistance Strategy (TAS). **Table 9.2.1** shows the budget allocations in the Mid Term Plan and Budget Framework.

Table 9.2.1 Proposed Budget Allocations in Medium Term Plan and Budget Framework

Tshs. million

	2005/06		2006/7		2007/08		2008/09	
A. Resource Envelope	**4,176,051**	100%	**4,650,120**	100%	**4,766,253**	100%	**5,231,713**	100%
Domestic revenue	2,066,752	49.5%	2,356,097	50.7%	2,673,861	56.1%	3,074,941	58.8%
Programme loan and grants	616,165	14.8%	693,012	14.9%	758,049	15.9%	804,549	15.4%
Project loans and grants	682,557	16.3%	749,998	16.1%	800,578	16.8%	859,726	16.4%
Basket Support Loans	101,291	2.4%	105,651	2.3%	59,283	1.2%	60,131	1.1%
Basket Support Grants	231,297	5.5%	175,025	3.8%	126,609	2.7%	109,126	2.1%
HIPC Debt relief－Multi lateral	93,600	2.2%	73,000	1.6%	95,000	2.0%	95,000	1.8%
MDRI（IMF）	0	0.0%	328,860	7.1%	19,780	0.4%	0	0.0%
Non Bank Borrowing	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Bank Borrowing	259,225	6.2%	163,478	3.5%	231,093	4.8%	228,239	4.4%
Adjustment to cash	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Privatisation Funds	10,420	0.2%	5,000	0.1%	2,000	0.0%	0	0.0%
Infrastructure Bond	114744	2.7%	0	0.0%	0	0.0%	0	0.0%
B. Expenditure Allocations								
1. Recurrent Expenditure								
1) Other Charges								
CFS	526,092	12.6%	268,895	5.8%	375,282	7.9%	447,772	8.6%
Ministries /*	1,389,143	33.3%	1,353,939	29.1%	1,382,009	29.0%	1,455,826	27.8%
Subtotal	**1,915,235**	**45.9%**	**1622834**	**34.9%**	**1,757,291**	**36.9%**	**1,903,598**	**36.4%**
Regions	17,447	0.4%	18,874	0.4%	19,948	0.4%	21,472	0.4%
LGAs	154,337	3.7%	154,405	3.3%	166,248	3.5%	178,727	3.4%
Special Exp.	0	0.0%	55,076	1.2%	62,510	1.3%	66,416	1.3%
Total OC	**2,087,019**	**50.0%**	**1,851,189**	**39.8%**	**2,005,997**	**42.1%**	**2,170,213**	**41.5%**
2) PE								
CFS	2,052	0.0%	2,363	0.1%	2,855	0.1%	3,364	0.1%
Parastatals	100,630	2.4%	157,845	3.4%	174,981	3.7%	194,934	3.7%
Ministries	251,010	6.0%	401,069	8.6%	467,653	9.8%	544,400	10.4%
Regions	20,343	0.5%	33,839	0.7%	39,204	0.8%	45,398	0.9%
LGAs	329,813	7.9%	565,094	12.2%	651,682	13.7%	742,843	14.2%
Subtotal	**601,166**	**14.4%**	**1,000,002**	**21.5%**	**1,158,539**	**24.3%**	**1,332,642**	**25.5%**
Total PE	**703,848**	**16.9%**	**1,160,209**	**25.0%**	**1,336,374**	**28.0%**	**1,530,939**	**29.3%**
Total Recurrent	**2,790,867**	**66.8%**	**3,011,398**	**64.8%**	**3,342,372**	**70.1%**	**3,701,152**	**70.7%**
2. Development Expenditure								
1) Local								
Ministries	358,036	8.6%	592,759	12.7%	420,291	8.8%	482,310	9.2%
Regional/LGAs	12,002	0.3%	15,289	0.3%	17,120	0.4%	19,267	0.4%
Total Local	**370,038**	**8.9%**	**608,048**	**13.1%**	**437,411**	**9.2%**	**501,577**	**9.6%**
2) Foreign								
Ministries	975,558	23.4%	1,002,657	21.6%	967,148	20.3%	1,013,711	19.4%
Regional/LGAs	39,587	0.9%	28,016	0.6%	19,322	0.4%	15,273	0.3%
Total Foreign	**1,015,145**	**24.3%**	**1,030,673**	**22.2%**	**986,470**	**20.7%**	**1,028,984**	**19.7%**
Total Development	**1,385,183**	**33.2%**	**1,638,721**	**35.2%**	**1,423,881**	**29.9%**	**1,530,561**	**29.3%**
Total Budget	**4,176,051**	**100%**	**4,650,120**	**100%**	**4,766,253**	**100%**	**5,231,713**	**100%**

/* OC for Ministries in 2005/06 includes PE (Salary Adjudtment) amounting to Tshs. 80,731.2 million

Source: Guidelines for the Preparation of Meduum Term Plan and Budget Framework for 2006/07 –2008/09, MPEE & MoF

9.3 Road Funds

Due to the lack of sufficient budget TANROADS could execute approximately 24% of required maintenance work for trunk roads and 44% of regional roads, in total 35% of required maintenance work for the FY2007/2008. Approved budget of TANROADS for FY 2007/08 is approximately 77% of the planned development work for trunk roads, 44% of that for regional roads and 69% of the planned work in total.

The financial source of road maintenance come from the Road Fund managed by the Roads Fund Board provided in the Road Tolls (Amendment) No.2 Act, 1998. The key functions of the board is to advise the Minster on new sources of road levies, adjustment of rates of existing levies and on regulations for the collection of road levies for the purpose of ensuring an adequate and stable flow of funds to road operations and to supply the money deposited into the Fund.

9.3.1 The Sources of the Road Fund

The financial sources of road maintenance come from the road funds managed by the Roads Fund Board. The Road Tolls (Amendment) No. 2 Act 1998 gives the road funds as the following sources[3]:

- All moneys collected as roads tolls imposed on diesel and petrol;
- Transit fees;
- Heavy vehicle licensing;
- Vehicle overloading fees; and
- Other sources determined by the Parliament.

The fuel levy accounts for over 95% of the funds.

9.3.2 2007/08 Budget and the Road Fund

Some of the outstanding features of the 2007/08 budgets are;

- Transport Sector Improvement Program requirements of US$ 640 million per annum for the next 10 years;
- Roads take up about 777.2 billion Tsh. or about 12.8% of the budget. This is about 95% of the requirements including maintenance needs;
- Excise duty on petrol and diesel increased by Tsh. 22 and 20 respectively; and
- Fuel levy from 100-200 Tsh per liter.
- Motor vehicle registration and transfer tax increased from 20,000 TSHs to 80,000, 230,000 and 100,000 with engine sizes bellow 1,500cc, over 1,500 and not exceeding 5000cc and over 5,000cc respectively.

[3] A Quick Review of the Implication of the 2007/08 Government Budget on Transport Infrastructure Financing in Tanzania, NM Lema, Associate Professor of Construction Management, University of Dar es Salaam, June 2007

The road maintenance fund, amount of 169,737 TSHs billion, is expected be generated by the last two features. Some of the implications are expected based on the 2007/08 budget framework as follows;

- Less than half of the required maintenance funds have been awarded up to the 2006/07. The additional increase is likely to contribute significantly toward better conditions of roads;
- Backlog maintenance requires about US$ 600 million to rehabilitate roads to bring the network to maintainable level. A recent analysis indicated that the best option for increasing the asset value is to concentrate on removing backlog;
- Absorption capacity is low. Though more funding is required in order to improve road maintenance, this must be accompanied by improvements in the capacity of implementation agencies and construction industries; and
- The road network under LGAs is about 50,000 km but receives 30% of the share, in comparison to TANROADS, which has about 28,000 km, receives about 70% of the share. This creates the imbalance of maintenance level between them[4].

However, it is expected to see better management of traffic in the near future with the increase of allocated budget for road maintenance, which includes expenditures for traffic control and management facilities. The capacity of implementation agencies and local governments should be enhanced as well.

9.4 New Revenue Generation Scheme

This section presents some possible schemes for the funding source of the proposed projects. In addition to the revenue and expenditure forecast described in the former chapter, by referring the world experience in other cities, the study team estimates the potential of utilization of land related property. Firstly, the chapter covers the analysis of the current system on property & land taxation and suggests the possible increase in its collection. Secondly, it discusses the potential of utilization of the property without increasing the tax rates as the schemes to generate revenue that are relatively new to Tanzania, such as Tax Increment Financing (TIF), Property Right and Development Right.

9.4.1 Property and Land Taxation

(1) Introduction

It is well acknowledged among local administrators and development practitioners the rationale for taxing land and property, both as a source of local government revenue and in terms of its effects on efficient land use. Tax revenue is often an important source of finance for local governments and the level, design, and control of property taxation have been, thus, discussed in many countries. Especially, developing countries, including Tanzania, have been exercising a variety of local government reform efforts aimed at improving local service delivery.

[4] A Quick Review of the Implication of the 2007/08 Government Budget on Transport Infrastructure Financing in Tanzania, NM Lema, Associate Professor of Construction Management, University of Dar es Salaam, June 2007

However, these efforts did not sufficiently enhance the revenue of the local governments in Tanzania due to some constraints described as follows;

1) low coverage of the properties/land surveyed;
2) underestimated value of the properties/land;
3) low tax rate applied; and
4) limited capacity of the tax evaluators/collectors, etc

A focus in Tanzania has been shifted to non-application of the market rate of the properties/land, as one of the critical elements to generate the local revenue.

This section initially reviews the practice in property/land taxation in Tanzania by comparing the property/land taxation applied to other countries. It then discusses application of the value-based property/land tax and, therefore, possibility of the local revenue enhancement.

9.4.2 Property Taxation in Tanzania

(1) Historical Background

1) Property Taxation

Tanzania has been undertaking a variety of macroeconomic and structural reforms aimed at higher and sustained economic and social development. One important reform priority has been placed on the rationalization of government to improve service delivery and provision of physical infrastructure. To realize the local authority reform objectives, the Government in 1996 developed a "Local Government Reform Agenda 1996-2000" (GOT, 2005[5]).

This Local Government Reform Agenda was translated into the action plan, called "Local Government Reform Programme", with attention focused on strengthening local government capacity to absorb increased responsibilities and financial resources. Priority is being placed on improving local government financial management systems, multi-sectoral planning and service delivery capacity. The Government is also developing appropriate mechanisms to ensure consistency between district programs and sector-wide/national policy priorities (IMF, 1999[6]).

One critical prerequisite for sustainable local government reform is adequate financial resources. Thus, the Government has been evaluating various options to improve local own-source revenue mobilization. The primary effort has been on implementing a local property tax reform that began in 1993 (Kelly and Musunu, 2000[7]).

[5] The United Republic of Tanzania (2005) Local Government Reform Programme, Medium Term Plan and Budget July 2005

[6] International Monetary Fund (2000) Tanzania Enhanced Structural Adjustment Facility, Policy Framework Paper for 1998/99-2000/01.

[7] Kelly R. and Musunu Z. (2000) Implementing Property Tax Reform in Tanzania, Lincoln Institute of Land Policy, Working Paper.

This property tax reform initiative was structured to mobilize sufficient revenues to maintain the local physical infrastructure under World Bank's assistance and originally to develop a valuation roll for Dar Es Salaam. The valuation exercise was divided into three phases. Phase One (1993-1996) valued about 30,000 properties in Dar es Salaam. Phase Two (1997-2001) was expand by 17,000 properties in Dar es Salaam. Phase Three (2001-2005) completed the valuation roll for Dar es Salaam.

(2) Legal Basis

1) Legal Basis for Property Tax

The Local Government Finance Act of 1982 laid the foundation for the financial management and revenue raising powers of the local authorities. This Act authorized local authorities to collect a property tax and other revenues, such as a development levy (a form of poll tax), business licenses as well as user charges. Section 13 and 15c of this Local Government Finance Act allowed local authorities to impose a flat rate property tax by enacting local by-laws, which were subject to central government approval. These flat rate property taxes could be levied on buildings, adjusted by such factors as size, location, and use. In the following year, the Government enacted the Urban Authorities (Rating) Act of 1983 that introduced a property tax on ratable buildings. These two laws provide the legal basis for the current property tax system in Tanzania.

(3) Property Taxation in Dar es Salaam

1) Tax Base

The property tax base is legally defined to include only buildings, and not land, thus limiting the potential tax base. This limited tax base is due to extensive lags in the identification and maintenance of the building information on the tax roll. Dar es Salaam had about 400,000 buildings while the tax rolls only covered about 100,000 buildings in 1999. Kelly and Musunu (2000) pointed out some of the administrative constraints facing Tanzania with regards to increasing tax base coverage[8]. Property tax base identification was made mostly on an ad hoc basis. Property cards were created and updated periodically, with considerable lag in the building market information especially in the fast growing unplanned areas. There was a lack of systematic administrative procedures, proper tax maps or a consistent property identification numbering system. All this led to incomplete and out-of-dated tax roll information. There was no use of computerization, which has further complicated the maintenance of the property tax rolls.

However, the recent efforts made by the local government has systematically identified buildings and captured the information on the tax rolls. According to the interview with the chief municipal evaluator, the tax rolls of Ilala Musicality have contains 85,000 buildings and now reaches the coverage ratio of 85%.

[8] Kelly R. and Musunu Z. (2000) Implementing Property Tax Reform in Tanzania, Lincoln Institute of Land Policy, Working Paper.

2) Valuation

The Urban Authorities (Rating) Act stipulates that property should be valued based on the capital market value of the premise or, where the market value cannot be ascertained, the replacement cost of the buildings, structures and other developments, adjusted for depreciation. Until now, due to the perceived lack of market information, all valuation for rating is being done on a cost replacement approach. The law provides for a maximum allowable depreciation rate of 25 percent. In addition, the property tax roll is to be valued every five years or for such longer period as the responsible Minister may approve. According to Kelly and Musunu (2000), it is assumed that the average valuation ratio may be in the order of 30-50% of market value, with large variations among properties. This low valuation ratio would typically be attributed to the valuation standards used, lags in the valuation roll, and lack of indexation in the unit rates used for the flat rate system.

3) Tax Rate

Most local governments in Tanzania initially introduced a flat rate property tax system. This flat rate property tax system would apply a single tax amount imposed on each building, no matter how large the size is, and was simple to administer. It created the controversial issue on inequity given the vast differences in use, size, and location of buildings. Thus, the flat rate system in Tanzania has introduced a number of adjustments—differentiating the flat rate by size, building use and location. (Kelly and Musunu, 2000)

Table 9.4.1 1988-1996 Flat Rate for Properties applied in Dar es Salaam

(Unit: Tshs)

Description	Flat Rate per Property
Residential Un-surveyed Areas	200
High Density Residential Surveyed Area	300
High Density Residential Surveyed Area in CBD	10,000
Medium Density Area	1,000
Low Density Area	2,000
Industrial Area	10,000-50,000
Un-surveyed Commercial Area	500
Surveyed Commercial Area outside CBD	1,000

Source: Dar Es Salaam Property Rates By-Laws of 1989

For instance, Dar es Salaam reinstated a property tax in 1987 based on a simple flat rate system, which applied a flat amount per building and divided the city into eight zones by land use, and a specific unit amount applied to each building within a particular zone. After several adjustments made, Ilala Municipality, for instance, introduced the current flat rate system in 2003, which differentiates the size and 11 different use of the building (residential, commercial, service trade, petrol station, hotels/guest house, institutions, industrial complex, bar & restaurant, commercial complex, light industry, and heavy industry) in each distinct ward. The **Table 9.4.1-3** tabulates the flat rate initially applied to Dar es

Salaam in 1987 and the current one applied to Ilala Municipality in 2003.

Table 9.4.2 2003 Flat Rate for Residential and Commercial Properties in Ilala Municipality

(Unit: Tshs)

Use of Property	Area	Flat Rate per Property
Residential/Swahili Type		10,000
Residential/Modern Type		15,000
Residential cum-commercial		20,000-30,000
Commercial	- 12-48m2 - Over 48m2	25,000-30,000 30,000-50,000
Service Trade		40,000-100,000

Source: Ilala Municipal Council (Property Rate) By-law of 2003

Table 9.4.3 2003 Flat Rate for Other Properties in Ilala Municipality

(Unit: Tshs)

Use of Property	Area	Flat Rate per Property (A)	Flat Rate per Property (B)
Petrol station & filling stations		250,000	75,000
Hotels	- 1-200m^2 - Over 200m^2	300,000	-
Guest house	- 1-200m^2 - Over 200m^2	150,000	100,000 150,000
Institutions	- 1-500m^2 - over 500m^2	500,000 750,000	
Industrial complex	- 1-600m^2 - 600-800m^2 - over 800m^2	400,000 500,000 600,000	
Bar & restaurant	- 1-50m^2 - over 50m^2	75,000	45,000 75,000
Commercial complex	- 1-200m^2 - over 200m^2	300,000 450,000	
Light Industry	- 1-250m^2 - over 250m^2	150,000 400,000	100,000 150,000
Heavy Industry - Office - Godowns	- 1-400m^2 - over 400m^2 - 1-50m^2 - over 50m^2 - 1-400m^2 - over 400m^2	250,000 500,000 20,000 30,000 50,000 100,000	

Note: Location (A): City Centre, Kariakoo, Gerezani, Shaurimoyo, Ilala, Upanga, Buguruni, Tabata, Vigunguti and along Nyerere Road. Location (B): Kinyerezi, Chanika, Pugu, Msongola, Ukonga, Gongo la Mboto, Kitunda, Kipawa, Kiwalani and Kupunguni and areas away from Nyerere Road.

Source: Ilala Municipal Council (Property Rate) By-law of 2003

For the rated (surveyed) properties, the fixed percentage of the property value is applied as the property tax. The equal percentage of the ratable property value is applied among these three municipalities:

0.15% of the ratable value for the residential and residential cum-commercial properties and 0.20% of ratable value for commercial properties, industrial properties and other uses. According to the interview with the chief evaluator at Kinondoni Municipality, the Municipality is to amend the by-laws by the end of 2007 and to impose 0.30% of ratable value for industrial properties and remains to impose the same rate for residential (0.15%) and commercial properties (0.20%). Minimum property rate for all the municipalities is set at 10,000 Tshs.

4) Tax Collection and Enforcement

The local governments in Dar es Salaam have been long silent for the law enforcement but recently made the best efforts to enhance the local revenue. Ilala Municipal By-laws, for instance, provide for a 25 percent penalty per year, or imprisonment for a term not to exceed twelve months and/or a fine of 50,000 Tshs for those owners who do not pay the tax. The by-laws also provide for a warrant to seize the personal goods and chattels of defaulters.

Despite the various legal provisions to enforce payment, collection rates appeared to be quite low (e.g., less than 30-50% in Dar es Salaam during 1990s). There are a variety of possible explanations to explain this low collection rate – ranging from a lack of taxpayer education/understanding to outright resistance, due to lack of local services. Some attribute the low collections largely to lack of political will and administrative efficiency (Kelly and Musunu, 2000).

The tremendous efforts made by the local authorities contributed to the increase in collection rates up to 70-80%. According to the interview with the chief evaluator at Kinondoni Municipality, 1.6 billion Tshs was collected from the property tax in 2006, while the projected revenue was 2.2 billion Tshs. One of the essential contributors to this is installation of computer-aided information system, using GIS. In Kinondoni, attributes of 110,000 buildings, including the owner, use of the property, size and its evaluation rate are all computerized with its location, which helps to monitor those owners who do not pay the property tax. Other essential measures were also undertaken – establishment of the special unit in the local administration, designated only for tax collection activities, capacity development of this unit, providing an adequate number of staffs, office and transport. Exchanging information on the large taxpayers from Tanzania Revenue Authority and taxpayers education/sensitization programme, establishment of pay stations at Mtaa level, and publishment of defaulters in the newspaper all contributed to an increase in high collection ratio.

Table 9.4.4 Revenue by Property Tax in Ilala Municipality

(Unit: million Tshs)

Year	Revenue by Property Tax	Growth (Base Year 2000)
2000	542	1.00
2001	549	1.01
2002	690	1.27
2003	574	1.06
2004	722	1.33
2005	616	1.14
2006	1,500	2.77

Source: Interview at Ilala Municipality

9.4.3 Comparative Study on Property and Land Taxation

A comparative study has been conducted by Bird and Slack (2002[9]) which illustrates the property and land taxation system practiced in 25 different countries. The following discussions will summarize the findings in this study: what is taxed, how it is taxed, and at what rate?

(1) What is taxed?

The first step, when installing the taxation system, is to answer what should be taxed; properties, land or both. The choice of tax base in some 25 countries is summarized in the following table. The current taxation exercise shows that most countries impose a tax on both land and buildings (or improvements), usually taxed together but in some countries, like Tanzania, taxed separately. In these countries, the land portion is often taxed more heavily than buildings.

The debate on what is taxed has not been resolved with respect to developed countries. The original arguments for land taxation were made in a context in rapidly growing cities where the land value is not stable. It has been, therefore, suggested that valuing land separately may be appropriate in developing countries in which urban areas are growing rapidly (Bahl, 1998[10]). In many developing countries, land and buildings are in practice assessed separately in any case, and so does Tanzania.

[9] Bird R. M.and Slack E. (2002) Land and Property Taxation Around the World: A Review
[10] Bahl R. (1998) Land Taxes versus Property Taxes in Developing and Transition Countries

Table 9.4.5 Tax Base and Basis of Assessment in Selected Countries

Counties	Tax Base	Basis of Assessment
OECD:		
Australia	Land or land and improvements	Market value; rental value; or combination
Canada	Land and improvements (sometimes machinery included)	Market value
Japan	Land, houses, buildings, and tangible business assets	Market value
Germany	Land and improvements; farm properties also include machinery and livestock	Market value (rental income/construction costs); area
United Kingdom	Land and improvements; some plant and machinery	Market value for residential; rental value for non-residential
Central & Eastern Europe:		
Hungary	Unimproved value (plot tax); buildings (building tax)	Area or adjusted market value
Latvia	Land and buildings	Market value
Poland	Land, buildings, and structures	Area
Russia	Land for land tax; structures for property tax; assets for enterprise property tax	Area; inventory value of structures; value of assets
Ukraine	Land	Area; self assessment
Latin America:		
Argentina	Land and buildings	Market value
Chile	Land and improvements	Area by location for land; depreciated cost for buildings
Colombia	Land and buildings	Market value or self-assessment subject to a minimum
Nicaragua	Land, buildings, and permanent improvements	Cadastral value, self-declared value (unit cost, book or acquisition value)
Mexico	Land and buildings	Market value
Asia:		
China	Occupied land; land and improvements34	Area; market value or rental value
India	Land and improvements	Mostly rental value; limited use of area and market value
Indonesia	Land and buildings	Market value
Philippines	Land, building, improvements, and machinery	Market value
Thailand	Land and improvements (buildings and land tax); land (land development tax)	Rental value; market value
Africa:		
Guinea	Land and buildings	Rental value
Kenya	Land (but can use land and improvements)	Area; market value; or a combination
Tunisia	Land and improvements (rental housing tax); land only (tax on unbuilt land)	Area; rental value
South Africa	Land and/or improvements	Market value
Tanzania	Land, buildings, structures or limited development	Market value (or replacement cost)

Source: Bird and Slack (2002)

(2) How is it taxed?

Once the taxable base has been determined, the next step is to determine the value to which the tax rate is applied. In general, two distinct assessment methodologies are used for property and land taxation: area-based assessment and value-based assessment (Bird and Slack, 2002). Under an area-based assessment system, a charge is levied per square meter of land area and/or per square meter of building. Area-based assessments are commonly used where the absence of developed property markets makes it difficult to determine market value.

Market value assessment estimates the value that the market places on individual properties. Bird and

Slack (2002) summarizes the following methods used to estimate market value:

- The comparable sales approach looks at valid sales of properties that are similar to the property being assessed. It is used when the market is active and similar properties are being sold.
- The depreciated cost approach values the property by estimating the land value as if it were vacant and adding the cost of replacing the buildings and other improvements to that value. The cost approach is used when the property is relatively new, there are no comparable sales, and the buildings are relatively unique. The cost approach is also normally used to assess industrial properties.

Both approaches have advantages and disadvantages. Value-based assessment, if the value is assessed properly by size and location, is straightforward and can create a public consensus since value-based assessment results in a relatively less burden on low-income taxpayers than high-income taxpayers when compared to area-based assessment. On the other hand, area-base assessment is easier to understand and cheaper to administer than value-based assessments. It should be particularly emphasized where the real estate market is not well developed like in many developing countries.

(3) At what rate?

The most controversial argument on land and property taxation in many developing countries is made at what rate of taxation should be applied. Even in countries where progressive rates are imposed, the highest rate on assessed value seldom exceeds much more than 1.0 percent, and it is often lower. Moreover, the effective rate of property taxes is, owing to low assessment ratios and poor enforcement, often much lower than the nominal or statutory rate. In case of Tanzania, Dar es Salaam initially used a 0.1 percent rate in 1996 for valued residential properties (excluding land tax), raising the rate to 0.15 percent in 1998. Mwanza used a rate of 0.40 percent from 1992-1995. Iringa and Mbeya, on the other hand, used differential rates of 0.30 percent for residential and 0.60-0.70 percent for commercial buildings. In 1996, these two towns switched to a uniform rate system applying 0.70 and 0.60 percent, respectively.

Table 9.4.6 Reliance on Property Taxes by Local Governments in Selected Countries

Counties	Property Tax	Property tax as % of local revenues
OECD:		
Australia	Land tax; municipal rates	60.0
Canada	Property tax	53.3
Japan	Fixed property tax	45.3
Germany	Land tax	15.5
United Kingdom	Council tax; non-domestic rates	28.0
Central & Eastern Europe:		
Hungary	Property tax; plot tax; communal tax; tourism tax	2.2
Latvia	Real estate tax	18.2
Poland	Urban real estate tax, agricultural tax, forest tax	9.7
Russia	Land tax; individual property tax; enterprise tax	8.1
Ukraine	Land payments and taxes	9.5
Latin America:		
Argentina	Property tax	35.0
Chile	Property tax	35.1
Colombia	Unified property tax	25.9
Nicaragua	Property tax	6.4
Mexico	Property tax	13.0
Asia:		
China	Urban and township land use tax; house property tax; urban real estate tax; farm land occupation tax	3.0
India	Property tax	7.0 to 41.0
Indonesia	Land and building tax	10.7
Philippines	Real property tax	13.4
Thailand	Buildings and land tax; land development tax	1.2
Africa:		
Guinea	Rental value tax on housing; local business taxes	32.0
Kenya	Property rates	20.0
Tunisia	Rental value tax on housing; tax on unbuilt land; local business tax	27.2
South Africa	Property rates	21.0
Tanzania	Local building tax; national land rents	18.0

Source: Bird and Slack (2002)

(4) Revenue Enhancement Project

The Dar es Salaam City Council through its Revenue Enhancement Project engaged itself to undertake an assessment and subsequently design on overall Tax Administration for Dar es Salaam Local Authorities (DLAs). The intention is to improve and eliminate bottlenecks in tax administration as much as possible. The improvements required and made should reflect an improved/increased tax revenue collection to the levels targeted.

The consultant presents the design of the proposed new tax administration system for Dar es Salaam City Council based on their specific needs. The new tax administration system design is based on findings of the assessment done on the existing tax administration and stakeholders views.

9.5 Tax Increment Financing (TIF)

Infrastructure development project requires huge initial investment cost. Basically, development of infrastructure brings the economic benefits to the resident and property owner. It is considered fare and reasonable that part of the required investment fund for this potential benefit will be levied to the beneficiaries. Contrary to the relocation fee, which is the financial burden to the government, this levy will ease the financial burden of the infrastructure development. In spite of various discussions for this additional levy, there are many global examples utilizing the development levy by the fact that most of the cities in the world are in short of the development budget. However, it is a prerequisite that sustainable taxation system and the mechanism of market price, which are the basis of this system, needs to be implemented and in function.

Tax Increment Financing, or TIF, is a tool which has been used for redevelopment and community improvement projects throughout the United States for more than half a century. With federal and state sources for redevelopment generally less available, TIF has become an often-used financing mechanism for municipalities. Similar or related approaches are used elsewhere in the world though development levy/tax is more familiar tool as the additional funding source for the investment. It is a kind of fund based on the future property tax for those who will get benefit by the development of infrastructure such as BRT project by DART. However biggest difference and benefit of this scheme is that there is no additional tax to the owner or lessee.

9.5.1 Mechanism of Tax Increment Financing

TIF is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project such as a road, school, or hazardous waste cleanup is carried out, there is an increase in the value of surrounding real estate, and often new investment (new or rehabilitated buildings, for example). This increased site value and investment creates more taxable property, which increases tax revenues. The increased tax revenues are the "tax increment." Tax Increment Financing dedicates that increased revenue to finance debt issued to pay for the project. TIF is designed to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur. TIF creates funding for public projects that may otherwise be unaffordable to localities.

(1) The scheme to generate funds in TIF

Theoretically, the TIF does not require a city to raise the tax rate. It generates money for redevelopment by raising the value of the property in the TIF district. This mechanism can be described in the following way:

1. When the TIF is established, the local government looks at the existing value of all the properties in the TIF district. This is the “initial assessed value,” which stays flat for the entire TIF period

that the local government decide[11]. Once TIF is established, increased property tax revenue from the increased value of the TIF district does not go to the city's general fund but go separately to the TIF fund.

2. The property value in the TIF district would increase, if there were new development, improvement of existing property, or natural growth in property values. The difference between the initial assessed value and new assessed value is the tax increment.

3. The money created by the tax increment goes to a special TIF fund, which is separated from the city's general fund[12]. The TIF fund can be re-invested in the TIF district to develop public infrastructure and to encourage private investment. This investment will further induce the increase in assessed value of properties in the TIF district.

Figure 9.5.1 and **Table 9.5.1** show the basic mechanisms of TIF.

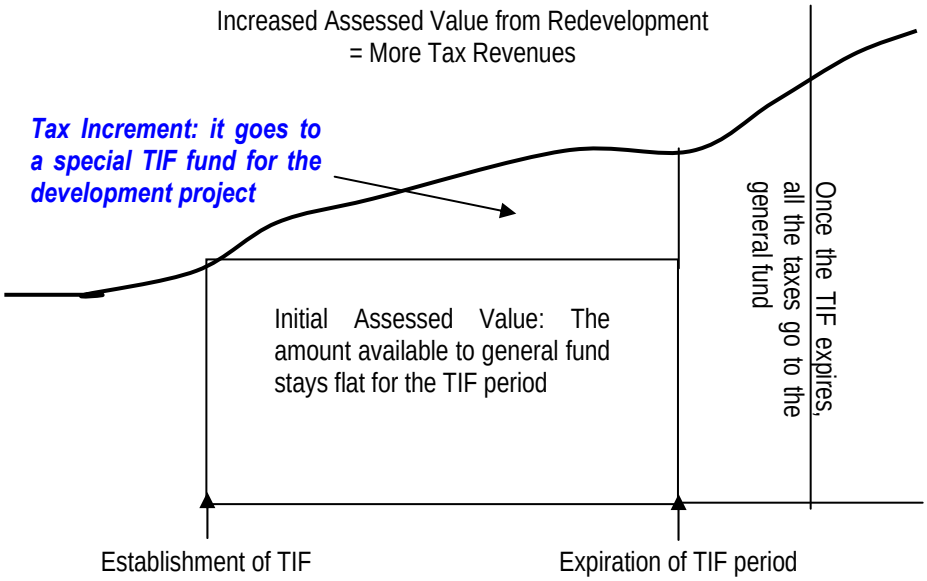


Figure 9.5.1 Basic Mechanisms of TIF

In this sample, we assumed that the initial assessed value of the properties in the TIF district was $1,000,000 when the TIF was established, and it increased by 20 percent to $1,200,000 in one year after it was established. The growth is $200,000, and the tax increment amounts to $20,000, if the tax rate is 10 percent. The tax increment goes to a special TIF fund, and it is re-invested in the TIF district. The TIF is not a new tax. It is a reallocation of a city's property tax revenue from the general fund to a TIF special fund, which allows the city to reinvest in the TIF district.

[11] Normally between 20 to 40 years, depending on state rules
[12] The general fund is used by public agencies to maintain, improve, and develop public schools, parks, and infrastructure.

Table 9.5.1 Generation of Tax Increment in a TIF District.

Step	Description	Amount
Initial Assessed Value (AV)	The total assessed value of all property when the TIF is established. This value is fixed for the TIF period.	$ 1,000,000
Current AV	The current assessed value of all propertyin the TIF district, one year after it was created (assuming it increased by 20 percent)	$ 1,200,000
Growth in AV	The difference between the initial AV and the current AV ($1,200,000 - $1,000,000 = $200,000)	$ 200,000
Tax Rate	The percentage of AV that goes to taxes.	E.g. 10%
Tax Increment	Taxes that go to the TIF fund ($200,000 x 10% = $20,000)	$20,000

Source: Study Team

9.5.2 Use of Fund

Basically there are two ways in utilizing the fund. One is so called Pay-as-you-go scheme, in which local government invest the amount of the fund reserved in the TIF scheme. The other is to issue TIF Bond at any time during the TIF period with TIF increment tax as the resource of redemption. Pay-as-you-go scheme does not have risk in redemption while TIF bond scheme has strength in raising necessary fund in a short term. In practice there are projects that use mix of these two schemes.

9.5.3 Leverage to Private Investment

One of the important theories/implications of TIF is the involvement of private investors. Since a local government could keep necessary fund for infrastructure redevelopment without increasing tax rate, this redevelopment project could attract private investment. Therefore TIF is considered as the self finance scheme for redevelopment under Public Private Partnership (PPP) scheme.

9.5.4 Community Participation

Strong community participation is a key for successful implementation of TIF. With consistent community participation, TIF can be an effective tool for implementing a community-based revitalization effort through developing affordable housing, improving public infrastructure, putting vacant land to productive use, creating job opportunities, and meeting other local needs. On the other hand, without sustained community participation, TIF gives a power to the local government to change the characteristics of a neighbourhood against the wishes of the community, and drive up the property values to the point where existing residents and businesses cannot afford to stay in the community. Accordingly, the success or failure of TIF depends on how active the community is in the processes of urban planning and development[13].

[13] Regarding the details of the mechanisms of TIF and community participation, see TIF Handbook prepared by

9.6 Property Right/Development Right

Development right is generally considered as un-quantitative benefit of development project that property value increase by the implementation of the project. Even in the case that the government is the owner of all land, still the right of use or lending fee could be the value added property. After the construction and implementation of BRT, land price/lending fee along the BRT line (road) will increase because of the better access. This future increase in land price, property value or lending fee is the basis of the development right. The government could also utilize this development right along the BRT corridor to the private investor in a public private partnership (PPP) project.

Another option is when DART purchases property along the BRT corridor; they could purchase/get property in wider area than actually required. Then after the completion of the project and when the property value increase DART could get profit by selling the property / right of use at the price more expensive than the price when they purchased before the project.

Neighborhood Capital Budget Group, 2001.

Chapter 10 Master Plan Evaluation

10.1 Introduction

The main purpose of this chapter is to show an overall economic performance of the proposed Master Plan as a whole from a view point of national welfare. Economic analysis of individual component projects was not made for prioritizing purpose, while GAM analysis suggests the priority of the proposed projects.

Economic evaluation of the Master Plan is conducted by means of a Cost Benefit Analysis (CBA). The Cost Benefit Analysis (CBA) is a means-end assessment defined by economic circumstances and where the investment is decided upon the conditioned evaluation cycle where input generates a result. As far as components are quantifiable, the CBA incorporates creative thinking by which less-tangible parameters are translated into "quantifiable" decision parameters. Whatever the level of creativity, the CBA upholds the principle that a final calculated findings can only be made on the basis of numerical evaluation that uses mathematical algorithms without any distorting interventions.

The CBA is an effective evaluation technique not only for a feasibility study (the economic analysis is commonly used to evaluate alternatives in a feasibility study), but also for understanding the effect of different development scenarios at the level of master plan. Because it is recognized that provision of quality transport systems (proposed in the Master Plan) plays a crucial role in long-term sustainable economic development of the country, it is important to identify the costs and benefits without possible distortions generated by weighting or quantifying efforts for non-quantifiable variables[1].

The CBA in this chapter was made by comparing the case "With the Master Plan" and the case "Without the Master Plan". The principle of the evaluation is based on the classic evaluation methodology with "Discounted cash flow", and "Conversion of the market prices to the economic prices".

For each case, a set of economic evaluation indicators; namely, economic internal rate of return (EIRR), net present value (NPV), and benefit/cost (B/C) ratio was computed.

[1] See for example, World Bank, *Sustainable Transport: Priorities for Policy Reform*" World Bank Policy Paper, Washington,

10.1.1 Vehicle Operating Costs

Saving of vehicle operating cost (VOC) is one of the most important items to be measured in the economic analysis. In order to estimate precise VOC values, types of the vehicles in Dar es Slaam are categorized into the eight groups: Motorcycle, Passenger Car (Sedan), 4WD (Jeep), Pickup, Mini Bus, Bus, Short Body Truck, and 3 axle truck. In each group, a typical (representative or popular) model available in the market is selected referring the car dealers in Dar es Salaam and the relevant study reports.

Prices of VOC component items were studied at car-dealers, petroleum stations, and petroleum companies in Dar es Salaam in addition to the research on tax regulations, statistic yearbooks and recent relevant reports. The prices in the market are converted into the economic prices for the economic analysis purpose. **Table 10.1.1** summarizes the unit vehicle operating cost as of year 2007 by vehicle type in the financial prices.

Spare parts costs are also consulted with car dealers, owners and drivers in Dar es Salaam and summarized in the **Table 10.1.2**.

Table 10.1.1 Unit Cost of Vehicle Operating Cost by Vehicle Types (Financial Price)

	Motor Cycle	Passenger Car	4WD (Jeep)	Pickups	Mini-Bus	Bus	Short-body Truck	3 axle truck
Representative Vehicle	Suzuki TF-125	Toyota Corolla	Toyota PRADO	Toyota Hilux	Toyota Hiace	Toyota Coaster	Toyota Dyna	SCANIA
New Vehicle Price (000 Tsh) without Tax		20,000	40,000	25,000	27,000	48,000	30,000	
New Vehicle Price (000 Tsh) with Tax	4,500	31,100	60,000	37,000	40,000	72,000	45,000	
Used Vehicle Price	1,500	8,350	30,000	20,000	25,000	35,000	27,000	55,000
Service Life (yrs)	10	12	12	10	10	10	12	14
Hours Driven per Year								
Kilometers Driven per Year	15,000	25,000	30,000	39,000	40,000	70,000	40,000	86,000
Life time running kilometers	150,000	300,000	360,000	390,000	400,000	700,000	480,000	1,204,000
Tire Cost (Unit)	40,000	80,000	145,000	90,000	90,000	250,000	250,000	
Required number of Tire (incl Spare)	2	5	5	5	5	7	7	11
Set Price of Tire (Tsh)	80,000	400,000	725,000	450,000	450,000	1,750,000	1,750,000	0
Running Kilometers	20,000	40,000	50,000	50,000	40,000	50,000	50,000	50,000
Tire Cost/1000 km								
Fuel Type used	Petrol	Petrol	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Fuel Costs (Tsh/L)	1,480	1,480	1,400	1,400	1,400	1,400	1,400	1,400
Fuel Consumption Rate (km/l)	45	12	10	12	10	5	7	5
Oil Costs (Tsh/L)	5,000	5,000	4,500	4,500	4,500	4,500	4,500	4,500
Distance between oil changes	5,000	10,000	10,000	7,500	7,500	8,000	9,000	10,000
Annual Maintenance cost - spare parts	45,000	258,000	498,000	296,000	400,000	720,000	373,000	0
Crew Cost (000TSh/year)	0	0	1,200	1,200	1,800	1,800	1,000	1,000

Source: JICA Study Team

Table 10.1.2 Spare Parts Cost

	Motor Cycle	Passenger Car	4WD (Jeep)	Pickups	Mini-Bus	Bus	Short-body Truck	3 axle truck	Trailer
Vehicle Price (000 Tsh)	4,500	31,100	60,000	37,000	40,000	72,000	45,000		
Spare Parts Rate (%)	1.00	0.83	0.83	0.80	1.00	1.00	0.83	0.83	0.83
Spare Parts Cost	45	258	498	296	400	720	374	0	0

Source: JICA Study Team

D.C. (1996)

10.1.2 Value of Time

A value of time for each vehicle type was estimated based on the household interview survey (HIS) and traffic count (occupancy rates) which was conducted in this Master Plan Study in June and July 2007. Based on the HIS, wage income brackets are distributed to the users of different types of vehicle. Applying the adjustment factors: vehicle occupancy rates and the Consumer Price Index, the time value of each vehicle is estimated as shown in **Table 10.1.3**.

Table 10.1.3 Value of Time by Type of Vehicle

Items	Unit	Passenger Car	Bus	Truck	Trailer
Average Monthly Income (A)	Tshs/person	679,833.4	223,993.4	231,562.7	142,679.7
Monthly Working Hours (B)	hr/month	186.0	186.0	186.0	186.0
Average Hourly Income (C:A/B)	Tshs/hour	3,654.1	1,204.0	1,244.6	766.9
Adjustment factor (D)		0.5	0.5	0.5	0.5
Average hourly income after adjustment (E: C*D)	Tshs/hour	1,827.0	602.0	622.3	383.4
Vehicle Occupancy (F)	person	1.9	29.0	3.0	3.0
Time Value by Vehicle in 2007 (E*F)	Tshs/hr	3,507.9	17,472.7	1,867.0	1,150.3
Total Time Value per Vehicle	USD/hr	2.76	13.74	1.47	0.90
Total Time Value per person	USD/hr		0.47		

Note: The adjustment factor is applied assuming that the home-based work, school, non-home-based business trips account for 50% of the total trips.

Source: JICA Study Team

10.1.3 Standard conversion factor

For the economic analysis, all financial costs and benefits should be valued at their opportunity cost to the country. Border prices are normally used to represent the opportunity costs, accordingly price distortion caused by imposition, limited opportunity, etc needs to be adjusted. Standard Conversion Factor (SCF) method is employed in this study as a compatible tool to convert the financial prices to the economic prices.

The standard conversion factor is an index, which converts domestic prices to border prices by adjusting the distortion of prices in the domestic market. A SCF is estimated at 0.869 for this study as follows:

$$SCF = \frac{M + X}{(M + Tm) + (X - Tx + Sx)}$$

where:

M : Total value of import (CIF)
X : Total value of export (FOB)
Tm : Total value of import duty
Tx : Total value of export duty
Sx Total value of export subsidy

Source: Japan International Corporation Agency (JICA)

Table 10.1.4 Calculation of Standard Conversion Factor

US$ millions

No	Item	1985	1995	2004	2005
1	Total Import (CIF)	946	1,510	2,366	2,826
2	Total Export (FOB)	287	593	1,175	1,457
3	Import Customs	566			645
4	Export Customs	1			1
5	1+2	1,233			4,283
6	5+3-4	1,798			4,927
7	SCF (5/6)	0.686			**0.869**

Source: Tanzania at a glance, World Bank, Ministry of Finance, TRA

In order to estimate an economic cost of a project, first, all the project components should be classified into the three categories: items of trade goods, non-trade goods and transfer items. It is assumed that the trade goods are equivalent to the foreign currency portion of the project, and aggregation of non-trade goods stands for the local currency portion. Transfer item means the portion of taxes.

In summary, following conversion factors (methods) are applied.

- For fuel price (gasoline and diesel): custom duty, additional tax and VAT are deducted and for lubricant price custom duty, specific tax and VAT are deducted.
- For the vehicle price: tax amounts, custom duty, specific tax, VAT, are deducted and for the tire costs custom duty and VAT are deducted.
- For tax, conversion factor of 0.00 is applied.
- For land acquisition and compensation, a standard conversion factor is applied.

10.1.4 Project Costs and Benefits

(1) Project Benefits

As major explicit benefits generated by the implementation of the master plan, savings in travel time and vehicle operating cost are identified as follows:

Savings attributed to those new BRT/secondary users who would have used buses (Dala Dala), passenger cars and other transport modes on roads:

- Travel time saving – BRT provides a faster travel (a shorter journey time)
- Vehicle operating cost (VOC) saving by the reduction of use of other transport modes

Savings to those passengers who still use the existing modes of transport (including Dala Dala users, passenger car users) is also identified. Such benefit is provided through increased travel speeds by the improved road capacity.

(2) Project Costs

Preliminary project costs (financial prices) were estimated based on the recent experiences in Tanzania. In estimating the costs in this study, price contingency, interest during construction and commitment charge were excluded (see **Table 9.1.1** in Chapter 9 for the cost by project).

Table 10.1.5 shows a summary of the overall financial and economic costs of the Master Plan. Assuming that proportion of the foreign currency portion and local currency portion is even (50:50), and applying to the Standard Conversion Factor at 0.869, the economic cost of all the projects is estimated at 3,923 billion Tshs.

Table 10.1.5 Economic Cost of the Project

Financial Cost (million Tshs)	Foreign currency portion	Local currency portion x SCF	Economic Cost (million Tshs)	Economic Cost (million USD)
4,198,399	2,099,200	1,824,204	3,923,404	3,086

Source: JICA Study Team

(3) Operation and Maintenance Cost

The road maintenance work is divided into two categories, i.e., (i) routine maintenance work and (ii) periodic maintenance work. The costs required for each type of maintenance work are estimated as described hereinafter.

1) Routine Maintenance Cost

The average annual routine maintenance cost spend by the TANROADS in the past years is roughly estimated at Tshs 3,784,000 per km for a 4-lane asphalt pavement road.

2) Periodic Maintenance Cost

The pavement design for the project is made covering a life period of 15 years after completion of the project so as to reasonably reduce the initial investment. In this study, an overlay with 7 cm of asphalt concrete is planned to conduct at 15 years intervals after completion of the project. The required cost of the overlay is estimated at 29,000 Tshs/m^2.

3) Overall Maintenance Cost

Assuming that the periodic maintenance by overlay will be made at appropriate intervals to cope with the increased traffic volume, the overall maintenance cost is estimated at 0.98% of the project cost.

10.1.5 Economic Evaluation of the Project

Table 10.1.6 summarizes the economic performance of the implementation of the Master Plan (see **Table 3.6.3** in Technical Report 5 for detailed cash flow). The economic internal rate of return (EIRR) is estimated at 41%, the benefit cost ratio is 3.87, and sufficient positive NPV, each of these indicators suggests a very good performance of the master plan.

Therefore, it can be concluded that the projects proposed in the Master Plan Study are economically feasible as a whole and its implementation will contribute to the economic development and prosperity of Dar es Salaam.

Table 10.1.6 Result of Cost Benefit Analysis

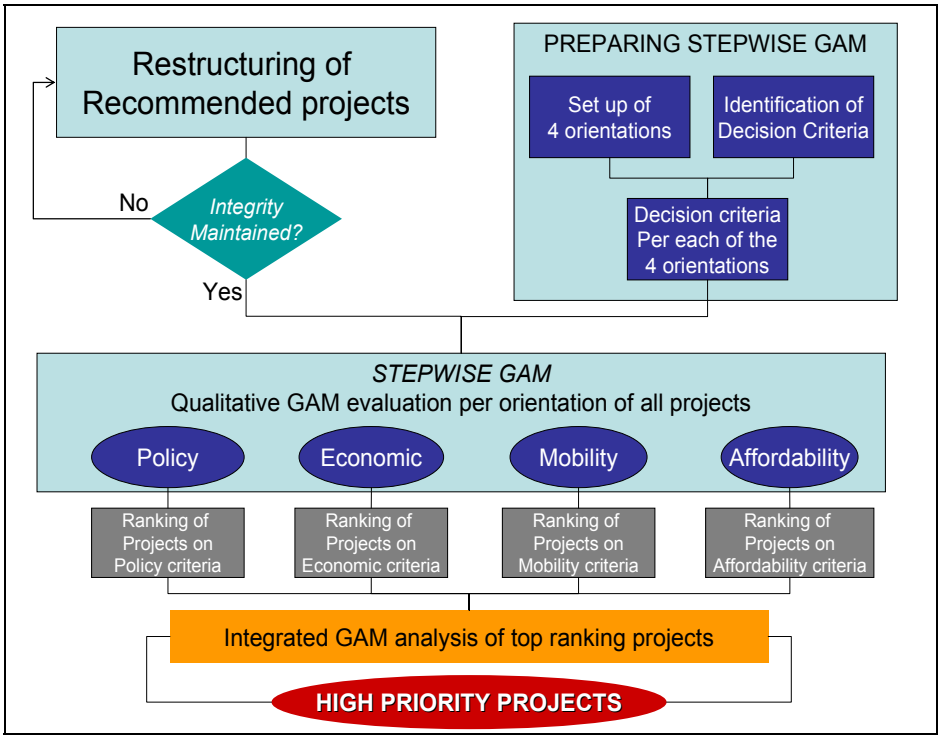
Indicator	Result
Net Present Value (in Tshs, at discount rate of 12%)	2,703,552 million Tshs
EIRR	40.7%
B/C (at discount rate of 12%)	3.87

Source: JICA Study Team

10.2 Goal Achievement Matrix

10.2.1 Building the GAM Framework

Determining the priority of projects recommended in the Master Plan is difficult because of major differences in scale and scope of the individual recommendations. The GAM evaluation therefore involved all experts on the Study Team who assisted in the identification of the criteria, the allocation of weights and the qualitative assessment of the recommended projects during the *Stepwise GAM*.



Source: JICA Study Team

Figure 10.2.1 Approach of GAM Analysis

A first step to further facilitate and substantiate a comparative analysis includes rearranging the projects and combine where possible into groups based on causal relationships. A second step to smoothen the analysis is the introduction of a stepwise evaluation process. The ranking and prioritizing using a single evaluation framework is difficult because the importance (priority) of individual investments / projects differs according to the stakeholders involved. For that reason, the GAM evaluation process includes in several steps, visualized in **Figure 10.2.1**.

The recommended projects are first evaluated via a qualitative appreciation (*Stepwise GAM*) by which the projects are appreciated and evaluated against a sets of decision criteria for 4 strategic orientations:

- *Upstream policy* arguments for ranking and prioritization of the recommendations that refer to the relationship of the proposed projects with the overall (transport) policy for Dar es Salaam and the aims and strategies of the principal stakeholders, in particular donor organizations, in terms of transport development in the city.
- *Economic development*; this evaluation concentrates on the concrete contribution of projects in strengthening future economic development of the city.
- *Mobility*; The mobility arguments look at the impact of the proposed projects on the city's transport system in creating a sustainable and integrated transport system.
- *Affordability*; The evaluation of projects according to affordability ranks and prioritizes projects in light of available investment budgets, donor contributions and other financial components.

The qualitative appreciation of the recommended projects against the criteria defining each orientation is by means of following evaluation scale:

Table 10.2.1 Typical Criteria

Appreciation	Qualified value	Quantified value
Very positive	++	5
Positive	+	4
Neutral	=	3
Negative	-	2
Very negative	--	1

Once the stepwise evaluation completed an all projects ranked for each of the four orientations, the *Integrated GAM* analyses the most attractive projects in more detail using tangible and quantifiable values to achieve a final weighted ranking and reasoned prioritization.

(1) Upstream Policy

Despite some successes, progress has generally been slow in terms of administrative reforms and the establishment of a coherent and integrated transport policy and authority, capable of efficient and effective management and development of the transport system in Dar es Salaam.

The division of responsibilities and institutional duplication are far from begin solved and sustainable solutions to establish a balanced regulatory and institutional framework for managing the city's transport system are yet to be implemented.

The majority of stakeholders fully support the development of a sustainable transport system in Dar es Salaam to achieve sustainable and balanced economic development and social progress; to achieve international creditworthiness; and to reduce poverty. The proposed policy evaluation criteria, presented in **Table 10.2.2**, reflect this commitment.

Table 10.2.2 Policy Decision Criteria

Policy Decision Criteria
Improving the relationship between stakeholders
Improving regulatory framework
Contribution to institutional sustainability
Improving mobility of persons and goods
Policy Logic (relationship between transport infrastructure investments)
Policy benefits (coverage of transport policy objectives)
Complexity (decision making and implementation process)

Source: JICA Study Team

The first three decision criteria assess the level to which the recommended projects contribute to improving the institutional and regulatory framework of the city's transport sector, a clear priority for all levels of decision-making. The next important policy criterion is the overall aim of public decision-makers to improve mobility of goods and people in Dar es Salaam. The three final decision factors evaluate the policy implications of the recommended investment in terms of their relationship with other ongoing investments and policy objectives as well as in terms of the complexity of the decision-making and implementation process.

(2) Economic benefits

The recommended projects take into account a wide range of objective, not always reflecting the economic rationale behind the proposed investment. The absence of accurate economic and financial information for several of the proposed projects does not allow using a detailed economic / financial evaluation for the purpose of prioritization. A qualitative appreciation of the possible economic and financial benefits remains therefore the single-best approach to assess of the economic value of each of the recommended projects. Wherever possible, the GAM analysis will use CBA-based results but in cases where this information is unavailable, the evaluation process uses alternative economic criteria, transformed into quantitative values. **Table 10.2.3** lists key qualitative economic decision criteria according to evaluate the recommended projects.

Table 10.2.3 Economic Decision Criteria

Economic Decision Criteria
Capital investment
Expected direct benefits
Expected indirect benefits
Timing of expected benefits
Financial sustainability
Financial commitment

Source: JICA Study Team

The first important criterion is the total amount of invested capital estimated for the realization of the project. Given existing budget limitations and IFI contributions, this criterion is undoubtedly a basic decision factor. The second two criteria look at the benefits the investment could generate. Given the divergence in projects, it is important not only to consider direct benefits such as NPV (for several projects this information is not available / relevant) but also to investigate the indirect benefits such as economic development, increasing access to transport for the poor, or more efficient operations. The time needed for the realization of a project is also a valuable economic decision criterion. The longer the construction / preparation period the further in the future revenues are expected, this compared to the present need of capital investments. The two final criteria appreciate the financial strength of the project in terms of sustainability (risk of changes in costs versus revenues) and in terms of successful and rapid implementation (level of financial commitment by all stakeholders and share of that commitment to total capital investment).

(3) Mobility benefits

One of the principal reasons for investing in the city's transport infrastructure is to improve mobility of people and goods. With the planned BRT, investments in the transport sector and infrastructure in Dar es Salaam are slowly orienting to achieving sustainable economic and personal mobility for all. The focus of attention also starts to consider institutional, organizational and regulatory reforms that increase the efficiency of transport and the effectiveness of transport management.

Mobility for Dar es Salaam thus means respectively:

- Reaching as much as possible persons and cargo per investment;
- Achieving transport efficiency improvements;
- Achieving policy efficiency improvements;
- Contribute to the development of modern public transport systems;
- Being cognizant of environmentally-friendly approaches;
- Meeting specific mobility demands for transport of the poor and less favored people; and
- Striving towards sustainable network development.

The evaluation of mobility focuses exclusively on the possible contribution to increasing the quality of movement of goods and persons and creating a sustainable transport network; for example, being integrated with BRT. Five key mobility criteria evaluate the recommended projects (**Table 10.2.4**).

Table 10.2.4 Mobility Decision Criteria

Mobility Decision Criterion
Level of increase in (motorized) person movement
Traffic flows improvements (elimination of bottlenecks, increase integration)
Improving conditions of non-motorized traffic
Strengthening public transport services
increasing accessibility to the transport system

Source: JICA Study Team

The first criterion is the most relevant because it assesses to what level the recommended investments contribute to increasing mobility in terms of number of people (and volumes of cargo) that will be capable to travel. Increase person movement closely relates to improving traffic flows and efficiency of transport services. Given the important share of non-motorized traffic in the city, improvements here are also important to the overall functioning of the city's transport system as is the increase and improvement of public transport. Combined, these two modes of transport cover nearly 80% of all person movement. The last criterion refers to the explicit need to increase accessibility to transport of the poor in Dar es Salaam as means to access job opportunities.

(4) Affordability

Affordability of the investment is undoubtedly a key decision factor as it distinguishes projects between "wishful thinking" and "realistic investments". Sustainable mobility and transport services for all must be cost efficient; this implies maintenance of the existing infrastructure networks as well as a rational and timely development of new or improvement of existing infrastructures. To be sustainable, these investments should take into account fiscal constraints.

The preference of recommended projects should therefore apply two different perspectives. The first perspective is increasing the expertise on or the decision-making process for achieving affordability of transport infrastructure investments. The second perspective is sustainability based on investment costs versus expected benefits and in balance with the available budget.

Table 10.2.5 presents the affordability criteria used for the qualitative evaluation of the recommendations of the Master Plan.

In practice, affordability constraints will require public decision makers to rationalize their transport sector development via improved coordination and planning as well as a stronger accent on generating revenues from infrastructure investments. Several strategic components link to this challenging approach, among them:

- Improving maintenance planning and budgeting should be a priority focus. Maintenance

should in that context gain priority over reconstruction or new construction to prevent the deterioration of previous investments.

- Improvement of mobility along the core axes of the network should focus on providing more choice to transport users and reducing delays and costs at the main interconnecting points.
- Commercialization and privatization should be as strategic and practical tool to increase efficiency, supported with adequate legislation and regulation especially for guaranteeing transparency in accounting and accountability in respect of service levels.
- Cost recovery becomes a critical component for affordability and assumes increased commercialization of infrastructure management and utilization, with a particular focus on improving the management and implementation of instruments such as tolls, excise duties, registration fees, license fees, etc.

Table 10.2.5 Affordability Decision Criteria

Affordability Decision Criteria
Size of the capital investment
Contribution to improved budgeting and planning
Maintenance of existing infrastructure
Relationship with Public Investment Plan

Source: JICA Study Team

(5) Integrated GAM : quantitative evaluation of selected recommendations

The *Stepwise GAM* allowed ranking the recommended projects based on their benefits to policy-making and mobility and of their economic feasibility and affordability. The *Integrated GAM* will further investigate the top projects (priority projects) via a quantitative appreciation using quantifiable values. The Study Team jointly evaluated the quantitative outcomes and added a qualitative appreciation which contributed to the final appreciation and ranking of the projects.

Sensitivity testing guaranteed sustainable results of the integrated GAM evaluation by changing the weighting of the various decision criteria and recalculating the results to generate a new ranking. At the end, the average score (rank) of each project was calculated as a combination of the ranking during the stepwise GAM and the rankings obtained from the different sensitivity tests during the integrated GAM, leading to an objective final ranking of the priority projects.

The integrated GAM analysis used six quantifiable and non-quantifiable criteria shown in **Table 10.2.6**.

Table 10.2.6 Integrated GAM decision criteria

Decision Criterion	Calculated value
Size of the capital investment	Million US$
Total traffic demand	Passenger car unit (2 way volume)
Traffic flow improvement	Voume capacity ratio
Policy relevance	Relations to upstream policy/plan/project
Investment Benefits	total traffic in pcu / million US$ capital investment
Time to operations	Years

Source: JICA Study Team

After a first calculation of scores without weighting the decision criteria sensitivity testing ensured sustainable results of the Integrated GAM. Sensitivity testing included changing the weight of the six decision criteria and recalculating the results for each of the projects, allowing therewith a new ranking. At the end, the definite results were the average rank of each of the selected projects. **Table 10.2.7** presents the weights allocated to the different decision criteria and consists of a weighting for the basic evaluation and weights for three sensitivity tests, each emphasizing different decision factors. The basic evaluation accentuates the two dominant decision criteria when considering traffic flow improvement and policy relevance and considers to a lesser extent the benefits of the investment and the size of the capital investment, the volume of traffic and the affordability.

Table 10.2.7 Weighting of the decision criteria (basic and sensitivity tests)

Decision Criterion	Basic	Sensitivity		
Size of the capital investment	10%	17%	15%	12%
Total demand	10%	17%	15%	12%
Traffic flow improvement	30%	17%	21%	26%
Policy relevance	30%	17%	21%	26%
Investment benefits	10%	16%	14%	12%
Time to operations	10%	16%	14%	12%
Control	100%	100%	100%	100%

Source: JICA Study Team

10.2.2 Integrated GAM Evaluation concepts

Some recommended projects encompass multiple activities (for example, in case of roads, feasibility study, final design and construction), can have overlapping goals or are inter-related. In order to facilitate the comparative analysis during the GAM analysis, the recommended projects are restructured and integrated wherever possible generating a total of 66 candidate projects.

10.2.3 GAM application and Priority Projects up to 2015

First, six numerical evaluation factors, including size of the capital investment, total traffic demand, policy relevance, investment benefits and time to operations, for each project is prepared based on the traffic demand forecast and cost estimation, as tabulated in **Table 10.2.8**. These numerical evaluation

factors, then, are standardized in order to compare the scale among these factors.

Using the initial weighting of the decision parameters, therewith assuming that traffic flow improvement and policy relevance have the highest priority, each project is scored by multiplying the weighting of decision parameters and standardized evaluation factors. **Table 10.2.9** shows a consolidated GAM results: consolidated GAM ranking by changing weights of evaluation factors.

Table 10.2.8 Baseline Data by Project

Project No.	Project Name/Location	Project Length (km)	Capital investment (mil Tshs)	2015 average traffic volume (pcus/day)	2030 average traffic volume (pcus/day)	2015 volume capacity ratio	2030 volume capacity ratio	Investment Benefits (pcu/investment)	Time to operations (Year)	Policy Relevance
101	New Bagamoyo Road Widening	17.0	81,371	33,656	45,056	1.0	1.3	0.6	2.7	3.0
102	Nelson Mandela Road Widening	12.9	59,290	40,115	80,468	0.8	1.6	1.4	2.3	1.0
103	Kigamboni Bridge and Access Road Improvement	8.1	130,116	28,912	86,916	0.9	2.6	0.7	3.8	3.0
112	Tabata BRT Development	15.5	106,390	40,000	60,000	1.2	1.8	0.6	2.9	2.0
104	Inner Ring Road/Kawawa Road Development	6.4	23,221	28,833	64,023	0.9	1.9	2.8	1.6	2.0
105	Nyerere Road Widening	15.1	51,128	32,929	73,275	1.0	2.2	1.4	2.5	2.0
106	Outer Ring Road Development	30.3	91,120	19,725	46,394	0.8	2.0	0.5	4.0	2.0
107/108	BRT Phase 1 Corridor and Road Development	14.8	33,379	5,056	16,799	0.4	1.3	0.5	2.6	2.0
109	Gerezani Area Transport Enhancement	18.4	27,561	22,964	57,908	0.7	1.7	2.1	2.9	3.0
110	Selander Bridge Bypass	7.2	30,411	27,927	52,026	1.3	2.5	1.7	2.4	2.0
111	Kigamboni Corridor Road Development	8.4	20,990	1,440	2,159	0.1	0.1	0.1	1.8	3.0
113	Flyover Installation (Phase1)	0.0	78,048	25,000	50,000	0.7	1.5	0.6	6.0	3.0
114	CBD Traffic Management	0.0	2,792	10,000	20,000	0.6	1.2	7.2	1.1	3.0
115	Expressway (Wazo-Sam Nujoma)	21.0	54,553	0	15,846	0.0	0.2	0.3	3.1	1.0
116/117/118	Expressway (Sam Nujoma-Airport)	28.3	2,066,844	829	45,204	0.0	0.8	0.0	6.9	1.0
119	Expressway (Airport-Kigamboni)	19.4	55,193	7	29,814	0.0	0.5	0.5	2.9	1.0
120	Mikocheni Road Widening	3.1	6,457	5,771	18,107	0.3	0.9	2.8	1.3	1.0
121	Haile Selassie Street Widening	5.0	10,666	5,934	9,002	0.3	0.4	0.8	1.5	1.0
122	Old Bagamoyo Road Widening	7.7	19,470	17,417	26,420	0.8	1.3	1.4	1.8	1.0
123	Mwinyjuma Road Widening	8.0	22,270	7,224	20,965	0.3	1.0	0.9	1.8	1.0
124	Shekilango Road Widening	5.3	19,183	11,427	26,535	0.5	1.3	1.4	1.5	1.0
125	Kigamboni Road Development 7/8	24.1	94,751	6,703	21,146	0.3	0.8	0.2	3.4	1.0
126	United Nations Road Widening	3.7	7,839	12,889	24,890	0.6	1.2	3.2	1.4	1.0
127	Morogoro Road Bypass (North)	6.8	19,922	5,379	23,807	0.3	1.1	1.2	1.7	1.0
128	Morogoro Road Bypass (South)	5.8	17,497	11,107	27,335	0.5	1.3	1.6	1.6	1.0
129	Uhuru Street Widening	7.5	16,078	11,698	20,261	0.6	1.0	1.3	1.8	1.0
130	Kimanga/Tabata Road Widening	4.5	9,443	15,000	30,000	0.7	1.4	3.2	1.5	1.0
131	Tabata Road Development	6.6	19,236	10,001	25,852	0.5	1.2	1.3	1.7	1.0
132	Changombe/Tandika Road Widening	4.3	10,019	14,572	37,081	0.9	2.4	3.7	1.4	1.0
133	Mbagala/Tandika Road Widening	3.5	11,044	12,391	30,702	0.6	1.5	2.8	1.3	1.0
134	Mbagala Road Widening	7.0	14,555	18,324	32,185	0.9	1.5	2.2	1.7	1.0
135	Sam Nujoma Road Extension	2.6	5,426	11,018	16,220	0.5	0.8	3.0	1.3	1.0
136	Kibada Road Widening	26.1	61,154	3,337	18,342	0.2	0.9	0.3	3.6	1.0
137	Kigamboni Road Widening	18.8	46,748	1,290	17,657	0.1	0.9	0.4	2.9	1.0
138	Kigamboni Road Development 1	1.7	3,594	210	2,889	0.0	0.1	0.8	1.2	1.0
139	Kigamboni Road Development 2	3.4	9,782	103	11,740	0.0	0.6	1.2	1.3	1.0
140	Kigamboni Road Development 3	4.5	9,326	1,210	9,151	0.1	0.4	1.0	1.4	1.0
141	Kigamboni Road Development 4	6.6	13,765	0	13,013	0.0	0.6	0.9	1.7	1.0
142	Kigamboni Road Development 5	6.4	18,670	804	11,214	0.0	0.5	0.6	1.6	1.0
143	Kigamboni Road Development 6	12.0	34,352	2,672	18,302	0.2	1.1	0.5	2.2	1.0
144	Vijibweni Road Widening/Development	5.7	16,564	6,223	25,643	0.4	1.5	1.5	1.6	1.0
145	New Bagamoyo Road Extension	13.7	40,553	8,346	21,992	0.3	0.7	0.5	2.4	1.0
146	Upanda Road Improvement	1.7	6,070	6,662	22,979	0.3	1.1	3.8	1.2	1.0
148	Msasani Area Road Improvement	1.8	2,274	0	3,726	0.0	0.7	1.6	1.2	1.0
149	Regent Area Road Development	12.2	16,346	2,575	7,881	0.5	1.5	0.5	2.2	1.0
150	Old Bagamoyo Road Extension	12.7	18,335	4,412	4,912	0.8	0.9	0.3	2.3	1.0
151	Kinondoni Regional Road Development	104.0	131,164	2,678	7,979	0.3	0.9	0.1	6.3	1.0
152	Kinondoni Regional Road Development 2	53.7	70,289	3,080	9,801	0.3	0.9	0.1	3.7	1.0
153	Ilala Regional Road Development	75.3	98,238	2,199	9,889	0.2	0.9	0.1	4.8	1.0
154	Ilala Regional Road Development 2	27.3	36,364	3,038	6,427	0.6	1.2	0.2	2.4	1.0
155	Temeke Regional Road Development	93.2	119,057	233	1,862	0.0	0.1	0.0	5.7	1.0
156	Temeke Regional Road Development 2	47.7	64,100	120	4,853	0.0	0.8	0.1	3.4	1.0
157	Temeke Regional Road Development 3	23.8	32,002	1,838	7,602	0.3	1.4	0.2	2.2	1.0
158	Corridor and Road Development 3	24.0	33,588	3,498	9,581	0.6	1.8	0.3	2.2	1.0
159	Tandika Area Road Improvement	17.5	25,512	4,123	12,274	0.8	2.3	0.5	1.9	1.0
160	Industrial Area Road Improvement	7.2	8,861	4,476	10,560	0.8	2.0	1.2	1.4	1.0
161	Tabata Area Road Improvement	4.5	6,892	5,868	9,402	1.1	1.7	1.4	1.2	1.0
162	Flyover Installation (Phase2)	0.0	58,536	15,000	30,000	0.4	0.9	0.5	1.0	2.0
	Total	983.7	4,198,399	578,253	1,446,070	27.3	68.7	70.5	138.9	-

Note: The score of 'policy relevance' indicates; 3: when the project has significant relevance to the existing upstream policy and plan and its feasibility study is ready or committed. 2: when the project has moderate relevance to the existing upstream poly and plan, 1: the project is important as an element of the Master Plan, but need to follow other projects and/or wait for other requirements to be prepared.

Table 10.2.9 Consolidated GAM Analysis

Project No.	Project Name/Location	Base Case Ranking	1st Sensitivity Ranking	2nd Sensitivity Ranking	3rd Sensitivity Ranking	Total Score	Overall Ranking
114	CBD Traffic Management	1	1	1	1	4	1
101	New Bagamoyo Road Widening	2	4	2	2	10	2
110	Selander Bridge Bypass	3	3	3	3	12	3
104	Inner Ring Road/Kawawa Road Development	7	2	4	6	19	4
109	Gerezani Area Transport Enhancement	4	6	6	4	20	5
112	Tabata BRT Development	6	5	5	5	21	6
103	Kigamboni Bridge and Access Road Improvement	5	9	8	7	29	7
105	Nyerere Road Widening	8	7	7	8	30	8
132	Changombe/Tandika Road Widening	10	8	9	10	37	9
102	Nelson Mandela Road Widening	13	10	10	11	44	10
134	Mbagala Road Widening	14	12	11	12	49	11
113	Flyover Installation (Phase1)	9	20	13	9	51	12
130	Kimanga/Tabata Road Widening	16	11	12	15	54	13
161	Tabata Area Road Improvement	12	16	15	14	57	14
126	United Nations Road Widening	19	13	14	17	63	15
106	Outer Ring Road Development	11	21	19	13	64	16
162	Flyover Installation (Phase2)	15	18	16	16	65	17
122	Old Bagamoyo Road Widening	18	17	17	18	70	18
133	Mbagala/Tandika Road Widening	20	14	18	19	71	19
135	Sam Nujoma Road Extension	22	15	20	21	78	20
111	Kigamboni Corridor Road Development	17	27	23	20	87	21
160	Industrial Area Road Improvement	21	22	22	22	87	22
146	Upanda Road Improvement	29	19	21	23	92	23
124	Shekilango Road Widening	26	24	24	25	99	24
128	Morogoro Road Bypass (South)	27	23	25	26	101	25
107/108	BRT Phase 1 Corridor and Road Development	23	30	29	24	106	26
129	Uhuru Street Widening	28	26	26	27	107	27
159	Tandika Area Road Improvement	25	31	30	28	114	28
120	Mikocheni Road Widening	32	25	27	31	115	29
131	Tabata Road Development	30	28	28	30	116	30
150	Old Bagamoyo Road Extension	24	32	31	29	116	31
144	Vijibweni Road Widening/Development	33	29	32	32	126	32
158	Corridor and Road Development 3	31	36	33	33	133	33
123	Mwinyjuma Road Widening	36	33	34	34	137	34
121	Haile Selassie Street Widening	37	34	35	37	143	35
149	Regent Area Road Development	35	38	37	36	146	36
154	Ilala Regional Road Development 2	34	39	38	35	146	36
127	Morogoro Road Bypass (North)	38	35	36	38	147	38
145	New Bagamoyo Road Extension	39	40	39	39	157	39
148	Msasani Area Road Improvement	41	37	40	41	159	40
157	Temeke Regional Road Development 3	40	44	41	40	165	41
140	Kigamboni Road Development 3	42	41	42	42	167	42
139	Kigamboni Road Development 2	45	42	43	43	173	43
138	Kigamboni Road Development 1	46	43	44	45	178	44
143	Kigamboni Road Development 6	43	46	45	44	178	45
125	Kigamboni Road Development 7/8	44	48	48	46	186	46
141	Kigamboni Road Development 4	49	45	46	48	188	47
142	Kigamboni Road Development 5	48	47	47	47	189	48
152	Kinondoni Regional Road Development 2	47	50	49	49	195	49
137	Kigamboni Road Widening	51	49	50	51	201	50
136	Kibada Road Widening	50	51	51	50	202	51
119	Expressway (Airport-Kigamboni)	52	52	52	52	208	52
115	Expressway (Wazo-Sam Nujoma)	54	53	53	53	213	53
153	Ilala Regional Road Development	53	55	55	54	217	54
156	Temeke Regional Road Development 2	56	54	54	55	219	55
151	Kinondoni Regional Road Development	55	56	56	56	223	56
155	Temeke Regional Road Development	57	57	57	57	228	57
116/117/118	Expressway (Sam Nujoma-Airport)	58	58	58	58	232	58

Source: JICA Study Team

Considering the budgetary constraints (assuming the total investment of 700 billion Tshs up to 2015 can be utilized for transport infrastructure project), the priority projects up to 2015 are selected as shown in **Table 10.2.10**.

Table 10.2.10 Short-list of Priority Project up to 2015

Project No.	Project Name/Location	Road Classification	Project Length (km)	Project Cost (mil Tshs)	Note
101	New Bagamoyo Road Widening	1	17.0	81,371	Excluding project cost of BRT buses
103	Kigamboni Bridge and Access Road Improvement	1	8.1	130,116	
104A	Inner Ring Road/Kawawa Road Development	1	3.6	16,882	
104B	Inner Ring Road/Kawawa Road Development	1	2.8	6,339	
105	Nyerere Road Widening	1	15.1	51,128	Excluding project cost of BRT buses
106	Outer Ring Road Development	1/2	30.3	91,120	
107	BRT Phase 1 Corridor and Road Development	3	9.4	11,635	
108	BRT Phase 1 Corridor and Road Development	2	5.4	21,743	
109A	Gerezani Area Transport Enhancement	1	15.8	21,588	Excluding project cost of BRT buses
109B	Gerezani Area Transport Enhancement	1	2.6	5,973	Excluding project cost of BRT buses
110	Selander Bridge Bypass	2	7.2	30,411	
111	Kigamboni Corridor Road Development	2	8.4	20,990	
112	Tabata BRT Development	4	15.5	106,390	Excluding project cost of BRT buses
113	Flyover Installation	1	0.0	78,048	4 intersections: Tazara, Ubungo, Mwenge, Kawawa-Nyerere
114	CBD Traffic Management	1/2/3	0.0	2,792	7 Signalized Intersections
120	Mikocheni Road Widening	2	3.1	6,457	
132	Changombe/Tandika Road Widening	2	4.3	10,019	
		Total	148.6	693,002	

Source: JICA Study Team

Some of the projects scores high marks in the GAM analysis but fail to be selected as the priority projects and vice versa. The reasons to select (not to select) the priority projects are summarized below.

(i) Mikocheni Road Widening (Project No. 120): this project is selected as one of the priority projects since it is considered as a part of the Selander Bridge Bypass Project (Project No. 110).

(ii) Kigamboni Corridor Road Development (Project No. 111): this is selected as the priority project since it is considered as an essential project to generate the urban development within the urban growth boundary of Kigamboni.

10.3 Preliminary Vehicular Emission Study

10.3.1 Introduction

The purpose of this study is to evaluate the amount of vehicular emission, in particular carbon dioxides (CO_2) to be generated by the regional future traffic and transport condition around Dar es Salaam Metropolitan Area, and carry out a comparative study under following two scenarios; i.e., **with-** and **without** proposed regional urban transport improvement projects in Years 2015 and 2030.

10.3.2 Computation of Vehicular Emissions

The daily amount of the total emission loading of pollutants, $\mathbf{W_s}$, is computed by,

$$\mathbf{W_s = \Sigma E_s \cdot CK} \quad (1)$$

where $\mathbf{E_s}$ is the vehicle-type air pollution emission factor of targeted pollutants, and **CK** is the computational results (vehicle times kilometers) of the future traffic and transport demand forecast. Here, three different vehicle types such as passenger car, truck and trailer are considered.

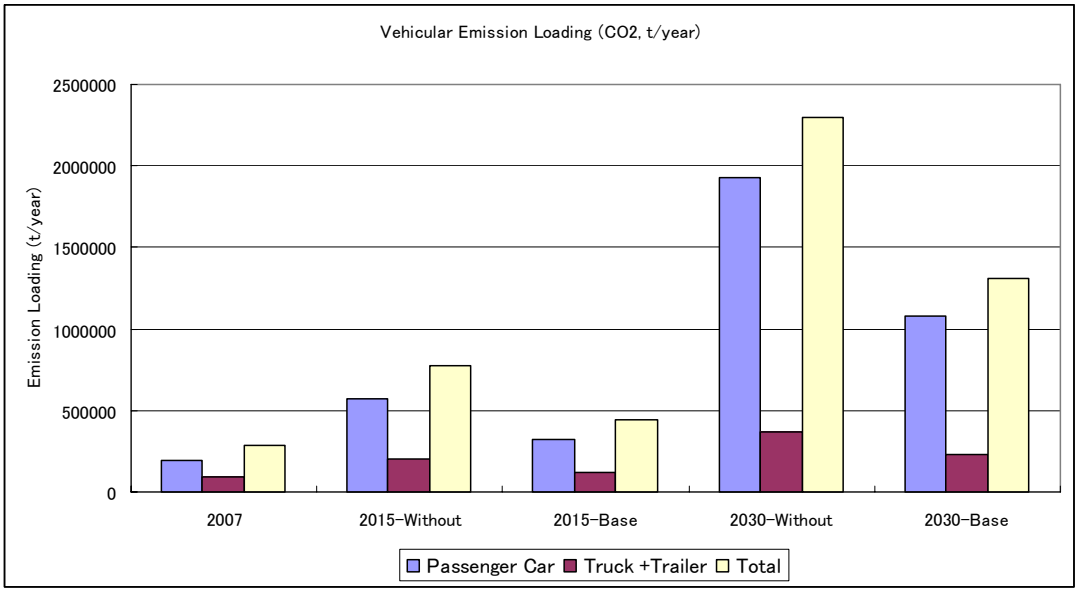
No information and/or parameter of CO_2 emission factor are summarized in Tanzania, yet, accordingly, vehicular emission factors summarized in the study report prepared for Tokyo Metropolitan Government[2] are used in this study. In general, the order of the magnitude of CO_2 emission factor of old vehicles tend to be larger than those of new ones. However, due to the lack of precise information of the vehicle age by the vehicle type, only one type emission factor is used for each vehicle types within this estimation. No long-term vehicle maintenance/inspection programs that will specify the future vehicle type and the vehicular emission condition exist yet in Tanzania, so it is assumed that no significant change in the vehicular condition will occur till Year 2030.

The estimation of the environmental benefit to be provided by the proposed transport project is carried out by evaluating the amount of the reduction of the emitted CO_2 loading, that is caused by the change of vehicle-kilometer of entire transport situation.

10.3.3 Results and Discussions

Based on the evaluation procedures mentioned above, the calculation of the regional amount of CO_2 - vehicular emission loading in Years 2015 and 2030 is carried out. **Figure 10.3.1** shows the computational results of total CO_2 vehicular emission loading. **Table 10.3.1** summarizes the environmental benefits (i.e., the reduction of the emitted CO_2 loading) to be caused under different scenarios, indicating that about 40% of the emission of the without case scenario is saved by the implementation of the Master Plan.

[2] Environmental Bureau, Tokyo Metropolitan Municipality, Study on Vehicular Emission for Future Traffic Demands in Metropolitan Area, 2000



Source: JICA Study Team

Figure 10.3.1 CO_2 Vehicular Emission Loading

Table 10.3.1 Environmental Benefit (Reduction of CO_2 Vehicular Emission Loading)

Year	Reduction (t/year)	Reduction (%)
2015	327,039	42
2030	986,811	43

Note: Reduction (%) = 100 x (Emission without - Emission with)/(Emission without)

Source: JICA Study Team

Chapter 11 Implementation Monitoring - Indicators and Role of DUTA

This Chapter discusses the indicators used for monitoring the Master Plan implementation through the performance evaluation of DUTA. The accent in the discussion is on the evaluation of progress in the realization of the Dar es Salaam Transport Policy and System Development Master Plan. However, because the improvement of the city's transport system is part of a wider perspective of economic and social progress, the discussion is broadened with a generic discussion of the methodology and indicators necessary for monitoring the city's long-term development.

11.1 Monitoring the development of transport

The establishment of the Dar es Salaam Urban Transport Authority (DUTA) and its efficient functioning will undeniably be instrumental in lifting the city's transport system to world city levels. Monitoring the performance of DUTA is therefore a high priority and requires a highly structured methodological approach.

The monitoring of good financial governance / performance is formally introduced in the organization via the external auditor, who controls the financial flows and accounting practices in DUTA. As part of its auditing mandate, the external auditor will control the utilization of allocated public budgets, distinguishing between operational budgets and investment budgets, considering the financial flows via DUTA between up-stream ministries and the two principal Line Agencies (including donor funds), and the revenues generated from issuing licenses and permits.

With the objective of maximizing good governance, also the managerial and operational performance of DUTA should be monitored.

Following performance-monitoring techniques are briefly discussed and explained how they can monitor good governance:

1. Logical Framework Approach and Project Cycle Management; and
2. Output Based Management and Performance Based Management.

It will be up to the decision-makers in DUTA to decide what method will be the most appropriate for assessing the Authority's performance.

11.2 Logical Framework Approach and Project Cycle Management

(1) Description

The ***Logical Framework Approach*** (LFA) was adopted in the sixties as a planning tool for overseas development activities by USAID and originated from private sector management theories such as the "management by objectives", popular in the sixties and is now widely used by donor organizations[1].

LFA is an analytical, presentational and management tool to:

- Analyze the existing situation during the preparation phase;
- Establish a logical hierarchy of means by which objectives will be reached;
- Identify potential risks to achieving sustainable outcomes;
- Establish how outputs and outcomes might best be evaluated;
- Present a summary of the project in a standard format; and
- Monitor and review projects during implementation.

A distinction is necessary between what is known as the Logical Framework Approach (LFA) and the Logical Framework Matrix (Log Frame). The approach involves the entire set of strategic processes in preparation of a concrete implementation while the matrix is the product of this analytical approach is the matrix that is used for the evaluation of projects, investments, and strategies.

An example of the Log Frame Matrix is presented in **Table 11.1.1**. The Log frame matrix has four columns and usually four or five rows, depending on the number of levels of objectives used to explain the means-ends relationship of the project.

- The *vertical logic* identifies what the project intends to do, clarifies the causal relationships, and specifies the important assumptions and uncertainties (columns 1 and 4).
- The *horizontal logic* defines how objectives are measured and the means by which the measurement is verified (columns 2 and 3). This provides the framework for implementation monitoring and evaluation.

[1] See European Commission, *Aid delivery Methods. Volume 1 Project Cycle Management, Part 2 Logical Framework*. March 2004, 3rd update. The first PCM manual was produced in 1993

Table 11.1.1 Example of LogFrame Matrix

Project Description	Indicators	Source of Verification	Assumptions
Overall Objective – The project's contribution to policy or programme objectives (impact)	How the OO is to be measured including Quantity, Quality, Time?	How will the information be collected, when and by whom?	
Purpose – Direct benefits to the target group(s)	How the Purpose is to be measured including Quantity, Quality, Time	As above	If the Purpose is achieved, what assumptions must hold true to achieve the OO?
Results – Tangible products or services delivered by the project	How the results are to be measured including Quantity, Quality, Time	As above	If Results are achieved, what assumptions must hold true to achieve the Purpose?
Activities – Tasks that have to be undertaken to deliver the desired results			If Activities are completed, what assumptions must hold true to deliver the results?

LFA can be used throughout the activity management cycle in:

- Identifying and assessing activities that fit within the scope of country programs;
- Preparing the project design in a systematic and logical way;
- Appraising project designs;
- Implementing approved projects; and
- Monitoring, reviewing, and evaluating project progress and performance.

The usefulness of Log Frame thinking is supported by four principal arguments:

- It documents clearly the change away from activity/input to a project/output focus;
- The output orientation keeps clients at the forefront;
- Scarcity of resources requires priority setting, which in turn are based on specific objectives;
- Many applications have demonstrated that it works well in planning.

Log Frame is more than an output-orientated approach. A thorough application involves concrete specifications of intended impacts / objectives, bringing in a "hierarchy of objectives" which are intertwined by a set of hypotheses indicating the intended impact as a consequence of the utilization of resources and, ultimately, the resulting benefits. Realism and consistency are imperative to develop appropriate hypotheses and identify available resources.

By linking resources, outputs, and impact in a realistic and consistent manner, Log Frame based analysis is output and impact oriented and therewith

- Increases consistency, accountability and transparency;
- Facilitates co-operation; and
- Can be used by planners and decision makers at different levels.

Project Cycle Management (PCM), also known as Participatory Planning, is a similar technique to increase transparency and accountability and to maximize the efforts of introducing good governance in the workings of DUTA. The method is a more modern version of the original Log Frame from which it originated and which is still considered part of PCM by for example the European Commission[2].

PCM became popular in the early nineties when JICA began its full-scale introduction of the method and also the European Commission fully adapted PCM as its primary set of project design and management tools, enhancing the standing Logical Framework Approach with the principles of Objectives-Oriented Project Planning. PCM is therefore very similar to the LFA and also involves a principal matrix, known as the Project Design Matrix (PDM), an example is presented in **Table 11.1.2**.

Table 11.1.2 Example of a Project Design Matrix

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
Project Purpose			
Outputs			
Activities	Inputs		
			Pre-conditions

PCM again applies a vertical and horizontal logic:

- Vertical Logic includes:
  - Project Purpose, objectives that the project should achieve within the project duration;
  - Overall Goal, direction that the project should take next
  - Outputs, strategies for achieving the Project Purpose;
  - Activities, specific actions taken to produce Outputs; and
  - Important Assumptions, conditions important for project success, but that cannot be controlled and its development is uncertain.
- Horizontal Logic includes:
  - Objectively Verifiable Indicators, standards for measuring project achievement;
  - Means of Verification, data sources from which indicators are derived;

[2] See European Commission, *Aid delivery Methods. Volume 1 Project Cycle Management*. March 2004, 3rd update. The first PCM manual was produced in 1993. In Part 2, the LogFrame is explained as practical implementation tool for PCM

- Inputs, Personnel, materials, equipments, facilities and funds required by the project;
- Preconditions, conditions that must be fulfilled before a project gets underway.

(2) Methodology assessment

The Log Frame and PCM are efficient tools for monitoring and evaluating DUTA management and operations. The methods are frequently described as logical, transparent, and consistent participatory problem-solving approaches for achieving:

1. Efficiency: The productivity in project implementation that reflects the degree to which Inputs have been converted into Outputs;
2. Effectiveness: The degree to which the Purpose has been achieved by the Outputs;
3. Impact; Positive and negative changes produced, directly or indirectly, as a result of the Implementation;
4. Relevance: The validity of the Overall Goal and Purpose at the evaluation stage; and
5. Sustainability: The durability of the benefits and development effects produced after completion.

However, the methods have some flaws; in particular both methods require a comprehensive preparation and detailed study of pre-conditions prior to establishing the evaluation and monitoring tool. Before implementing the monitoring system as practical tool, DUTA experts will have to pass six main stages[3]:

1. Clarify project scope – stakeholders, institutional capacity, project objectives, and resources;
2. Understand the nature of organizational relationships, management arrangements, and capacity constraints;
3. Determine the information needs of project implementers and other key stakeholders;
4. Review existing information collection systems and procedures;
5. As appropriate, develop and document monitoring system guidelines and formats; and
6. Provide training and resources to support systems development and implementation.

Furthermore, applying the Log Frame or the PCM Matrix to DUTA management and operations in a consistent and comprehensive manner as recommended by the EU Guidelines might become highly complicated because its requires in-depth and accurate structuring for each of the six above explained steps.

The wide range of preparation and the complexity and extent of the individual tools which combined make up the matrix might hinder a practical and continued application of the evaluation and monitoring tool, therewith missing the prime objective of transparency and accountability.

The full application of the two techniques and the use of the matrix also requires the introduction of

[3] See European Commission, *Aid delivery Methods. Volume 1 Project Cycle Management*. March 2004, 3rd update. p. 102

risk management techniques which in itself can be considered as a monitoring and evaluation tool in itself (see further).

11.3 Output-based Management and Performance Based Management

(1) Description

Output-based Management (OBM) originates from the international aid sector where it is known as Output-Based Aid (OBA), introduced to deal with the "*... primary challenge ... to ensure that aid- and taxfunded spending reaches the poor, that the services this money finances respond to their needs and preferences, that these services are delivered efficiently, and that public funds are used in a way that leverages private financing of service delivery.*"[4].

The principle of Object-based Management is to introduce a system that allows comparing the inputs with the outputs as schematized in **Figure 11.3.1**.

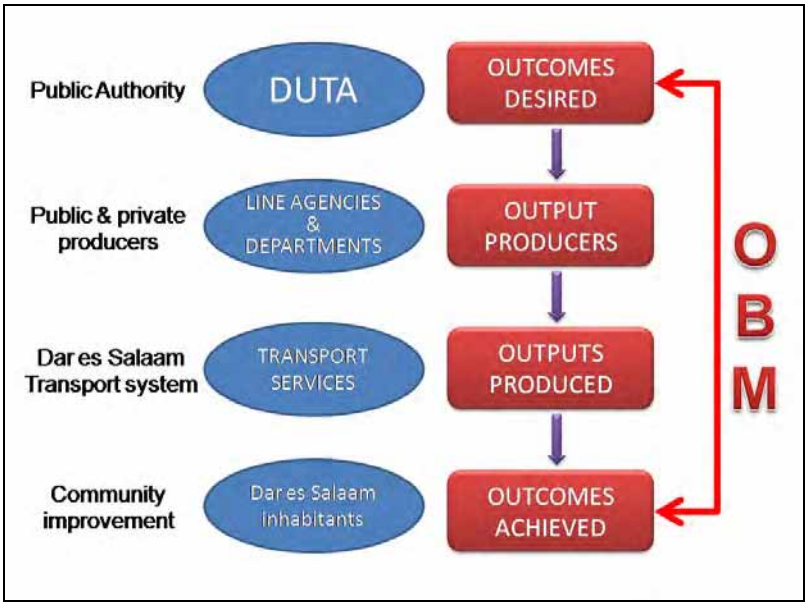


Figure 11.3.1 Output-based Management

DUTA is the principal Authority in policy, planning and funding of transport for Dar es Salaam but is also responsible for licensing, taxi regulation, subsidy administration, asset management, development of plans and policies, recommendations for funding, and works with all stakeholders to ensure effective 'on the ground' service delivery (by the Line Agencies, Departments and service providers). This broad responsibility implicitly imposes the need to monitor the working of the Authority and more specifically the necessity for comparing plans (desired outcomes) with implementations (outcomes achieved). Applying the Output-based Management methodology in the management system of DUTA would introduce a performance monitoring system using quantifiable and verifiable indicators to compare at frequent intervals the policy and investment results with the original plans on the basis of

[4] World Bank; International Finance Corporation. *Contracting for public services - Output-based aid and its applications*. Edited by Penelope J. Brook and Suzanne M. Smith. Available on Internet

quantifiable indicators, therewith increasing transparency and allowing concrete accountability.

The essence of Output-based Management is that a result is expressed as the objective of an investment, a program, or a policy that requires planned intermediate activities to achieve that objective. OBM assumes that when planning is done properly, progress can be measured and results assessed. Consequently, the executors of the program can be held accountable for delivering results to its stakeholders/superiors.

Examples of OBM measurement criteria are:

- *Quantity*: such as volume, level of supply, or other units of measure;
- *Cost/price*: not only full accrual cost but where possible also unit cost;
- *Quality*; evaluated on the basis of pre negotiated and prescribed standards;
- *Timelines*; such as delivery/deadline, service response time.

Output-based specification and measurement provides critical performance information for:

1. Agency performance in identifying, costing and producing outputs in the most efficient and effective manner;
2. Government's selection and resourcing of the most efficient and effective outputs in a contestable (competitive) environment; and
3. Comparison of actual versus intended (resourced) output performance.

Performance Based Management (PBM) is used by various donor agencies like JICA, JBIC and USAID for planning and managing the process of assessing and reporting progress towards achieving a Strategic Objective. It is more in particular a critical tool for planning, managing, and documenting the collection and utilization of performance data and therefore complements the working of Outcome-based Management as preparatory tool[5].

PBM is positioned one level above OBM as framework for implementing the performance evaluation on the basis of outcomes. PBM prepares performance evaluation by:

- Defining specific performance indicators, determining baselines and setting targets;
- Planning and managing the data collection process;
- Incorporating relevant data collection requirements into agreements;
- Planning related evaluative works;
- Estimating costs related to data collection and plan the financing; and
- Communicating expectations to those responsible for producing the outputs to cause measurable changes in performance.

[5] USAID, Policy and Program Coordination Bureau. *The Performance Management Toolkit - A Guide to Developing and Implementing Performance Management Plans*. Version April 2003.

PMP thus contributes to the effectiveness of the performance monitoring system, see **Figure 11.3.2**.

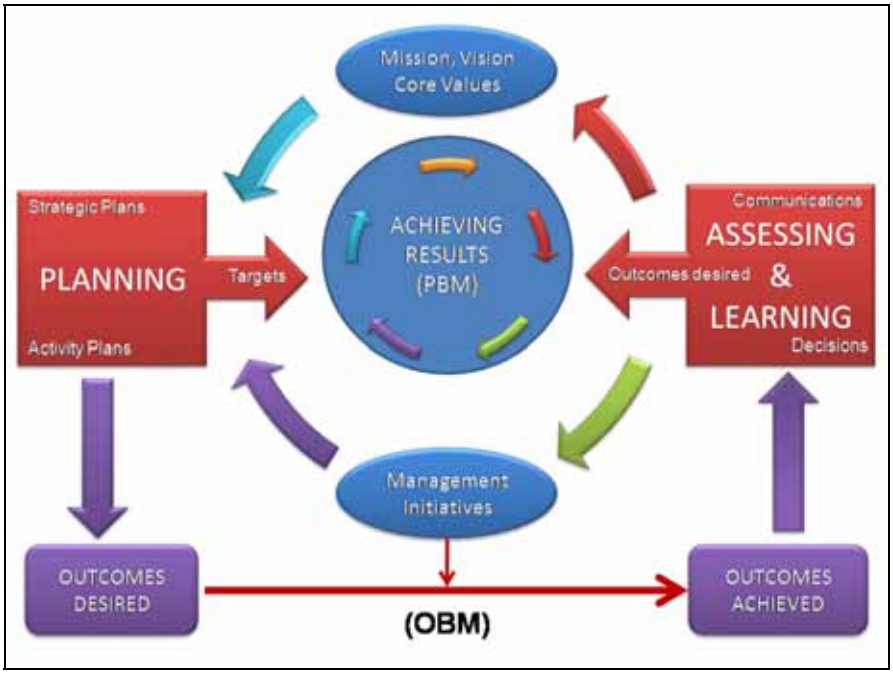


Figure 11.3.2 Integrating PBM and OBM in a single result-oriented vision

PMB is translated into practice with the development of the Performance Management Plan (PMP), which contains full documentation of the indicators used to track progress, their data sources, the quality of data available and responsibilities for collection and analysis of the data. PMP is thus a more elaborated evaluation framework than the one-page matrix often used in for example Log Frame.

(2) Methodology assessment

The combined method will create a comprehensive framework for a structured and coherent evaluation method and process, by structuring not only the evaluation process itself (OBM) but also the preparation and the execution of the evaluation process (PBM).

PBM will in the first place assist DUTA strategic managers in creating the appropriate evaluation and monitoring process combined with a structure for supervision and control of the evaluation process itself.

OBM is the tool for the physical monitoring of performance. The tool is particularly suited for performance monitoring in the fields of transport and land use[6] because the approach is based upon assessing quantifiable performance indicators therewith facilitating the measurement of improvement / progress while simultaneously reducing the risk for "result manipulation" and "human error".

According to the World Bank, OBM (or OBA) is particularly efficient as management and evaluation method because it offers the possibility of incorporating the private sector in public services, even

[6] The Government of Western Australia applies OBM explicitly in the fields of transportation and land use planning, see Government of Western Australia. Department for Planning and Infrastructure. *Annual Report 2002-2003*.

when these services are not profitable and therefore in principle not attractive to private investors. OBM namely facilitates output-based contracting and thus expands the scope for private participation and create new opportunities to leverage private financing of transport infrastructure. Performance-based Contracts is a tool, recommended for Dar es Salaam to set performance standards for DUTA, the Line Agencies, Departments, and public and private service providers. Applying OBM at the level of the transport authority (DUTA) will undeniably facilitate not only the evaluation of Line Agencies and Departments but also the utilisation of the evaluation results for reasons of accountability and transparency as well as for increasing disclosure of information.

Using output-based or result-based contracts to integrate the private sector is an efficient tool to

- Better target beneficiaries/outcomes;
- Strengthen accountability for performance; and
- Introduce incentives for efficiency/innovation;

11.4 Recommendations

The responsibility of monitoring the city's progress to reach world city status can be placed at different political levels, either national or city-level. In the context of underlying study, the evaluation method to assess progress towards world city status is not considered and therefore, only a general concept is presented on how this progress can be monitored.

A more detailed description of performance and progress evaluation methods is provided for the city's transport system. The responsibility of monitoring performance and progress and thus for the development and utilization of the evaluation model(s) is with DUTA, the Urban Transport Authority for Dar es Salaam.

The above described evaluation methods have their specific advantages and disadvantages. Common however is that the application of each of the above evaluation methods requires consistency and a firm commitment to evaluating the performance of DUTA including its Divisions and Departments, and of the Line Agencies and executing organizations / companies.

It should also be noted that other methods exist and could be used for the purpose of evaluating the performance. The selection of the three performance evaluation methods is based upon the inter-relationship between these methods which allows combining these methods into a single and comprehensive performance evaluation process.

As a conclusion, it is recommended to structure the performance monitoring and progress evaluation process as follows:

1. Outcome Based Management is recommended as overall performance evaluation method with the model itself "controlled" via Performance Based Management; and
2. Log Frame or Project Cycle Management is recommended for the evaluation of specific projects / investments.

Chapter 12 The Way Forward

This document is the Master Plan for the long-term development of the urban transport policies and systems in Dar es Salaam with the target year of 2030. A series of projects, programs, and plans are recommended in various fields, which require appropriate financing in terms of both timing and scale, and accordingly, implementation by responsible authorities and agencies. This last chapter summarizes the policies and strategies proposed in the Master Plan and consequently, necessary (or expected) actions to be taken by the relevant agencies. It is expected that some of these recommended actions will soon be taken to make the first important step towards the World City Vision of Dar es Salaam.

12.1 Principal Policies and Strategies

12.1.1 Short-term Policies and Strategies

The short-term policies and strategies focus on alleviation of the current and foreseen traffic problems in near future and preparatory works for consequent actions, especially in the field of institutional and administrative improvement. These actions include:

- Implementation of urgent projects

  Several critical locations are identified in the study area as follows:

  - The highest priority locations in terms of needed actions include Ubungo Intersection, Tazara Intersection and Bandari Intersection (involving several possible solutions in the surrounding Gerezani area).
  - The Mwenge Intersection (Sam Nujoma and New Bagamoyo Roads) will be next, with opportunities for flyover implementation as part of the programmed New Bagamoyo Road widening.
  - Morocco and Magomeni Intersections could as well be optimized in parallel with the programmed improvements (new Bagamoyo road widening). Chang Ombe Intersection, in turn, could be upgraded in line with BRT realization, although it is desirable to concurrently expand the Chang Ombe profile.
  - The Selandar Bridge area has clearly emerged as a congested area. While intersections flank

the bridge, it is unlikely that intersection-specific solutions will rectify this situation. Instead, more rigorous approaches (construction of a road-paralleling Ali Hassan Mwinyi Road by land reclamation) are needed as pursued within the framework of the longer-term Master Plan solutions.

A preliminary study has been prepared respectively for the Gerezani area transport enhancement and the Tazara intersection improvement. These documents should be utilized for the next step, that is, budgeting for the detailed design and construction work.

- BRT Phase 1 project implementation and supportive activities

Financing for the infrastructure for BRT Phase 1 has been committed, however, there remains a number of issues to be tackled toward its successful operation. DART Agency, as the system manager, is expected to develop attractive business models (through designing the contracts) for potential BRT/feeder bus operators and other business entities to be involved in the BRT-related business in Dar es Salaam. It is highly recommended to procure consulting services for "service development" of the DART Agency, in this regard.

- Public administration reform in the urban transport sector

In the history of Dar es Salaam or Tanzania, there has been no autonomous or self-financing public entity, which specializes in urban transport system development. In the long-term perspective, it is recommended to establish the Dar es Salaam Urban Transport Authority (DUTA) as a single authority, being responsible for the urban transport enhancement in Dar es Salaam. As the first step towards DUTA, it is desired to establish a board of management by inviting relevant stakeholders, horizontally and vertically. The initiative in establishing such functions should be taken by PMO.

- Capacity development

This study, sponsored by the Government of Japan, through technical cooperation by JICA, has established a good database for urban planning and urban transport planning purposes. Furthermore, a computerized transport model (a strategic model using STRADA) has been developed for Dar es Salaam. These products should be recognized as very valuable assets or foundations for further planning activities by the relevant people in Dar es Salaam. During the course of the study, an important decision was made by the steering committee for this study, that is, to establish the National Institute of Transport Studies (NCTS), which will be in charge of training the transportation planners in Tanzania. At the same time, this institute is expected to contribute to the activities of DUTA as a technical advisory entity. The National Institute of Transport (NIT) has been designated to take the initiative to develop this institute, which should be strongly supported by the Government as well as by donor agencies.

- Local tax revenue enhancement

It is almost safe to say that there has been no dedicated budgeting scheme for urban transport facilities in Dar es Salaam in the past. Accordingly, a very limited budget has been allocated to

urban transport facilities, and in most cases, such a budget came from organizations at the national level, but very little from the local government. Most of the trunk systems in Dar es Salaam will be financed by the central government, but many tertiary roads and local community roads should be developed by the local government, with a focus on quality pedestrian- environment development. While, there has been a very severe limitation in the revenue structure and sources in the local government by DCC, Kinondoni, Ilala and Temeke, the capacity of revenue authority at the local government level, both in terms of human resources and taxation coverage should be improved. This effort should be initiated immediately, in parallel with the current land use and transportation-planning effort.

- Urban Regeneration Plan along Morogoro Road

The BRT Phase 1 project will provide prosperous real estate and commercial/business opportunities along the corridor. Various urban functions including commercial/business office buildings, entertainment facilities, hotels, restaurants, schools, hospitals, government service functions, etc. will be attracted to the land along the BRT Phase 1 corridor. Sooner or later, it is also expected to change the current travel patterns to alleviate traffic congestion in CBD. In order to properly guide such demand in the real estate market, a local plan should be immediately prepared as a part of the current effort for developing a new land use plan by the Ministry of Lands, Housing and Human Settlement Development (MOLHSD).

12.1.2 Medium- and Long-term Policies and Strategies

Based on the preparatory works under the short-term policies and strategies, continuous effort should be made on the following:

- Establishment of the Dar es Salaam Transport Authority

The initiative made by the board of management should lead to the “executive phase” and consequently the “consolidation phase”. At this stage, NCTS will fully function as a technical supporting body to DUTA as well.

- Enhancement of NCTS

Following the establishment of the transport-training center in the initial phase, consequent phases should take place:

Phase 2: Department of Transport Planning

The Department of Transport Planning shall be established and expand the functions of the Centre to include transportation research activities.

Phase 3: National Centre for Transport Studies

NCTS will be fully developed into a more independent body that strengthens both training and research functions. The Centre will conduct research and consultancy works in various fields of

transportation and administers graduate programs in transportation.

- Establishment of the Dar es Salaam Urban Development Agency (DUDA)

  In order to guide future urban regeneration in Dar es Salaam, and in particular to implement the local plan prepared for the land along the Morogoro corridor, it is recommended to establish a new organization, called the Dar es Salaam Urban Development Agency (DUDA). This agency will be responsible for urban planning and development issues in Dar es Salaam, with close cooperation with the Dar es Salaam Urban Transport Authority (DUTA).

- Involvement of Private Sector

  Involvement of the private sector should be encouraged in various business opportunities related to the urban transport provision. The DART Agency needs to take the initiative to develop good and attractive business models for those potential entities, in particular, starting from BRT-related businesses. In the long-term perspective, it might be possible to invite investors into the toll business in Dar es Salaam. The proposed urban expressway system should consider every possibility of inviting private investors in developing the system.

- Monitoring and Revision of the Master Plan

  In general, any kind of master plan requires periodic reviews and updates. This urban transport master plan, of course, should be reviewed every 5 years by DUTA. Monitoring on the progress of the proposed implementation plan is essential in revising the Master Plan. DUTA should take a leading role in monitoring the progress in this regard.

12.1.3 Spine Policies and Strategies

There are several very principal policies that should be maintained for the next twenty years that are called Spine Policies and Strategies in this study.

- Quality development towards the enhancement of financing capabilities

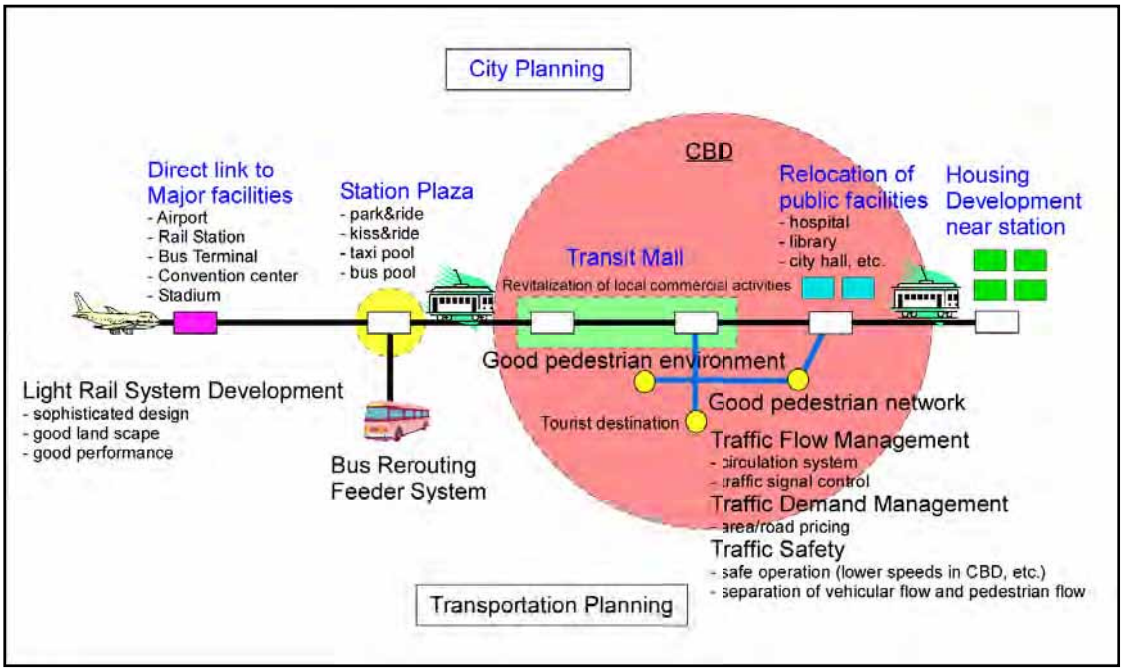
  Capacity or affordability of borrowing money from external sources, including international financial markets such as bond-issuing for the proposed urban transport infrastructure development, should be enhanced. However, it is in fact dependant on the stability and scale of the national economy. In order to enhance such capacity of the national economy, it is very much desired to increase exports to earn foreign currencies, however, Dar es Salaam itself will not be able to generate such exporting goods. While as a gateway city of Tanzania as well as of the Eastern African countries, Dar es Salaam should function as a trading and financial center of the region, which will support various industrial activities in the region. In order to invite such functions (investors), a quality living environment, transportation and communication infrastructures should be prepared in advance. BRT Phase 1 must be the first and most important initiative towards the creation of the quality of life in Dar es Salaam.

■ Pedestrian and NMT-focused development and Urban Road Design Standards

The development of a transport infrastructure in Dar es Salaam has been dominated by major facilities, namely trunk roads; while less attention has been paid to pedestrian facilities such as a safe and seamless footpath network, comfortable bus shelters, safe cycling paths, etc. One of the reasons to explain this is the lack of urban road (facility) design standards, which clearly indicate requirements of such pedestrian and NMT facilities. At the same time, toward a World City in the region, Dar es Salaam needs to provide quality urban transport and a living environment that the citizens can be proud of and visitors would appreciate. It is highly recommended to prepare urban (road) facility design standards employing the "universal design" concept in this regard. Every transport infrastructure development in Dar es Salaam should pay careful attention to the pedestrian and NMT environment.

■ Public transport oriented development

The current modal split between private car and bus is 11:89 (2007), which will change to 39:61(2030) where no significant demand management measures (other than BRT) are taken in place. It is actually quite difficult to attract people to use public modes of transport as their income increases. However, it is very necessary to increase use of future public modes of transport (BRT



and secondary buses) by taking every opportunity. One of the guidelines for the future urban development concept is "public transport oriented development" in which every effort in the field of urban development and transport infrastructure development should focus on the encouragement of using the public modes through land use planning and quality design. The figure above shows a general idea of the public transport-oriented development. As seen in the figure collaborative efforts, urban planning and transport planning are very essential to pursue this concept.

General strategies for public transport system development in Dar es Salaam are as follows:

- Encouraging people from "own" to "use"
- "On demand" or "Demand-responsive"
- Variety of means with many choices to meet users' desires
- Healthy and enjoyable
- "Universal Design"
- Better comfort than using a private car
- Environmentally friendly system (public enlightenment regarding their awareness to the environment is necessary)
- Recognition as a valuable "common asset" of the city – BRT and associated systems
- Public transportation system itself can become an attraction for tourists and visitors.

■ Accessibility to all

The transport infrastructure should accommodate demands of many kinds of citizens and visitors in various aspects. In particular, careful and continuous attention should be paid to so-called vulnerable people, including: poor people, elderly people, disabled people, women, and children. To meet every kind of demand for such people, the Government should make efforts as much as possible through various policy instruments. From the design point of view, the concept of "universal design" should be taken into consideration in developing the infrastructure. Besides, visitors are very important especially for Dar es Salaam as the gateway city of the country. For those people, it is important to provide information that is easy to understand the systems in the city.

■ Mobility to all

In general, emphasis is placed on public transport system development. Accordingly, BRT users will be able to enjoy high mobility in the city. While, car users mobility will remain at the same level of the current situation (which is suggested by the traffic simulation). However, it is necessary to provide high mobility for car users as well, especially for commercial vehicle

operators and high-profile car users. For this purpose, some road segments (routes) should be designated as "heavy-loaded roads" and "expressways" should also be provided to cover whole area of Dar es Salaam.

- Intensive development within UGB

  This master plan designates the spatial growth limitation of the city by proposing the urban growth boundary (UGB) to accommodate a population of about 6 million in 2030. Efficient provision of infrastructures require "ordered or controlled density" in terms of land use within UGB. In this regard, no significant infrastructure development is recommended outside UGB, while intensive infrastructure provision is encouraged within UGB.

12.2 Immediate Actions

Finally, some immediate actions to be taken by the stakeholders are summarized:

- PMO-RALG
  - Invite members to the board of management as the first initiative towards DUTA
  - Strategic budget allocation for DUTA preparation work
- MOID/TANROADS
  - Strategic budget allocation to the urban transport sector
  - Study on the urban road design standards and early establishment
  - Feasibility studies on the priority projects designated in the Master Plan
- MOLHSD/DCC/Kinondoni/Ilala/Temeke
  - Preparation of local plans for the Morogoro corridor / BRT terminal areas
  - Actions for revenue increase
  - Coordination with other infrastructure sectors including water supply, sewage and drainage
- DART
  - Early implementation of BRT Phase 1
  - CBD traffic circulation, management plan and design
  - Good business model development
  - Negotiation with TRL regarding the disused rail section for BRT use
- National Institute of Transport
  - Strong leadership in materializing NCTS