

**Ministry of Works
United Republic of Tanzania**

**Preparatory Survey for
Dar es Salaam Intersection Improvement Project
in the United Republic of Tanzania**

**Final Report
(Advance Release Version)**

December 2025

Japan International Cooperation Agency

Oriental Consultants Global Co., Ltd.

Eight-Japan Engineering Consultants Inc.

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The exchange rates applied in this Report are

USD 1.00 = TZS* 2,450 = JPY 151.0

* Tanzanian Shilling

Executive Summary

1. Introduction

Dar es Salaam is the main economic center of the United Republic of Tanzania and faces severe traffic congestion due to rapid population growth and motorization. This problem has evolved into a significant social concern for the city. In order to reduce congestion and improve public transport, a phased development of the Bus Rapid Transit (BRT) system is being implemented with the support of international organizations, such as the World Bank (WB), the African Development Bank (AfDB), and Agence française de développement (AFD). However, the introduction of the BRT system alone is insufficient to meet the city's growing transport demands.

In 2018, the Japan International Cooperation Agency (JICA), in collaboration with relevant Government of Tanzania agencies, conducted the “Project for Revision of Dar es Salaam Urban Transport Master Plan”. This initiative produced the Master Plan for Urban Transport in Dar es Salaam 2018-2040 (hereafter referred to as the “2018 Revised Master Plan”), which recommended measures such as: the introduction of an Intelligent Transport System (ITS), the improvement of eleven (11) major intersections; the development of public transport terminals; and the development of urban rail networks. These initiatives were proposed to address chronic traffic congestion and make efficient use of existing road infrastructure.

In 2020, JICA conducted a follow-up survey called the “Data Collection Survey on Urban Transportation in Dar es Salaam” to review progress of implementation of the recommended priority projects and identify areas requiring further support by JICA. The survey recommended the implementation of grade separations at Mwenge and Morocco intersections along New Bagamoyo Road; and a continuous grade separation along Nelson Mandela Road between Buguruni and TAZARA intersections.

Following these recommendations, the Government of Tanzania, through the Tanzania National Roads Agency (TANROADS), requested JICA's assistance in implementing grade separation projects at these strategic intersections. JICA subsequently initiated the “Preparatory Survey for Dar es Salaam Intersection Improvement Project”, which focused on selecting two target intersections (from Mwenge, Morocco, Buguruni, and TAZARA) and conducting the necessary studies for appraisal under a Japanese ODA loan.

2. Current Transport System and Development Plans

Dar es Salaam's urban transport system faces significant challenges stemming from rapid population growth and accelerated urbanization, which have resulted in severe traffic congestion. The existing road network is insufficient to meet the increasing transport demand, particularly during peak hours, when traffic speeds drop drastically.

Public transport in the city is mainly provided by the “daladala” minibuses, which are characterised by uncoordinated operations and unreliable service. The recent implementation of the Bus Rapid Transit (BRT) system has improved mobility; however, further expansion is necessary to effectively serve the city's growing population and transport needs.

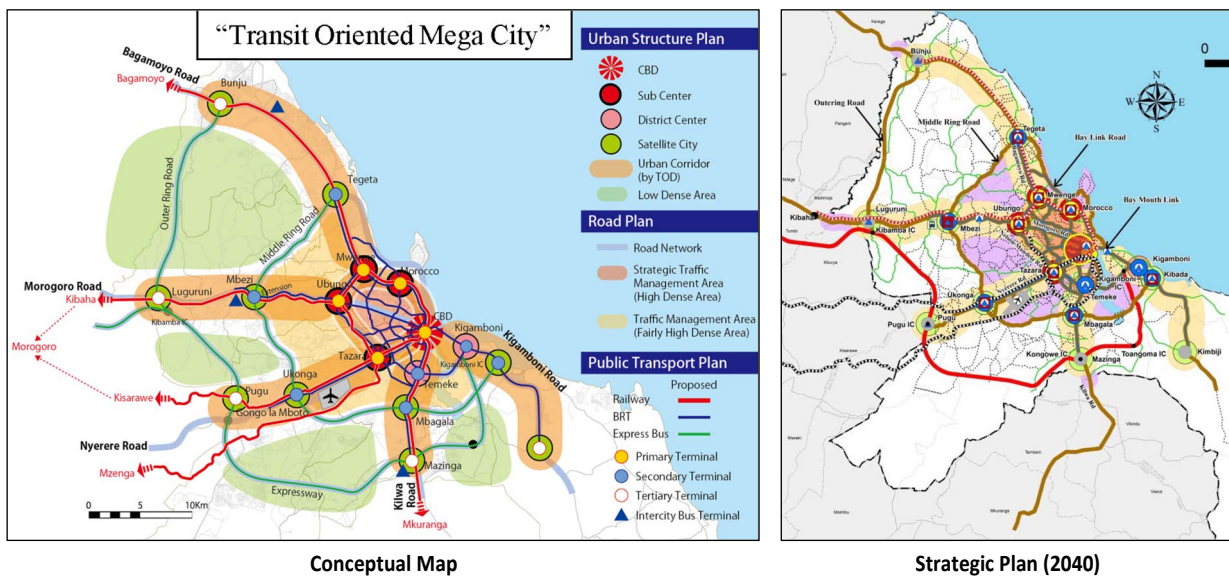
The city's strategic location as Tanzania's main port on the Indian Ocean makes it a critical hub for international trade and logistics, particularly for landlocked neighbouring countries like Rwanda, Burundi, and the Democratic Republic of Congo. However, traffic congestion in Dar es Salaam poses significant delays in cargo movement, increasing transportation costs and undermining the efficiency of the Central and Dar es Salaam Corridors.

To address these challenges, the Government of Tanzania, with support from international partners like the World Bank, African Development Bank, and JICA, is implementing various infrastructure development

projects. These include the expansion of the BRT system, the construction of new road networks, and the improvement of critical intersections through grade separation. Additionally, the ongoing construction of the Standard Gauge Railway (SGR) is expected to significantly enhance both passenger and freight transport, further improving connectivity within Tanzania and to neighbouring countries.

Tanzania’s National Development Vision 2025 emphasizes infrastructure development as a key driver of economic growth, aiming for the transformation of the country into a semi-industrialized economy with enhanced competitiveness at regional and global markets. Infrastructure projects in Dar es Salaam, such as the BRT network expansion, expressway construction, and development of ring roads, form an integral part of this vision.

Furthermore, the 2018 Revised Master Plan sets a long-term vision for urban transport up to 2040. It proposes the development of a radial and circular road network, the integration of advanced traffic management systems, and the promotion of Transit-Oriented Development (TOD). These measures aim to accommodate projected population growth, improve mobility, and enhance the overall quality of life for the residents of Dar es Salaam.



Source: JICA. 2018. Project for Revision of the Dar es Salaam Urban Transport Master Plan

Figure 2.1 Conceptual Map and Strategic Plan of Urban Transport Master Plan

Institutionally, the TANROADS and the Tanzania Rural and Urban Roads Agency (TARURA) are responsible for the development and maintenance of the road network. However, both agencies face significant challenges, particularly due to inadequate funding and delays in project approvals. The Roads Fund, which is primarily financed through fuel levies, serves as a key source of road maintenance funding. Nevertheless, the fund meets only about 40% of the total financial requirements, resulting in a substantial backlog of road maintenance needs.

Previous studies conducted by TANROADS focused on improving traffic flow at critical intersections in Dar es Salaam through grade separation projects. These studies identified eight major intersections experiencing severe congestion and playing a vital role in traffic circulation within the city. These selected intersections such as—Mwenge, Morocco, Magomeni, Buguruni, Tabata, and others—were prioritized based on operational efficiency, truck activity levels, and alignment with planned infrastructure developments, like the BRT.

In addition, the 2018 Revised Master Plan identified eleven (11) key intersections for grade separation, with the objective of reducing congestion, enhancing road safety, and facilitating the efficient operation of public transport systems like the BRT.

Several grade separation projects have already been implemented to mitigate traffic congestion in Dar es Salaam. The TAZARA Flyover, completed in 2018, was the first major grade separation project in Tanzania and significantly improved traffic flow at the intersection of Nyerere Road and Nelson Mandela Road. The Ubungo Interchange, completed with support from World Bank, further alleviated congestion at a critical junction by introducing multi-layered flyovers with dedicated BRT lanes. Similarly, the Chang’ombe Flyover and the Uhasibu Flyover were constructed as part of the BRT Phase 2 development. These projects collectively aim to improve traffic flow, enhance the efficiency of the BRT system through dedicated lanes, and provide safe and efficient grade-separated solutions at critical intersections.



TAZARA Flyover



Ubungo Interchange



Chang’ombe Flyover



Uhasibu Flyover

Source: JICA Survey Team

Figure 2.2 Completed Flyovers in Dar es Salaam

3. Current Conditions at the Identified Intersections

(1) Mwenge Intersection

Mwenge Intersection is a key signalized intersection in Dar es Salaam, connecting New Bagamoyo Road, Sam Nujoma Road, and Coca-Cola Road. New Bagamoyo Road, a vital radial arterial road linking the city center to suburban areas, was expanded to four lanes under Japan’s Grant Aid Programme. Similarly, Sam Nujoma Road, forming part of the city’s ring road network, also features four lanes.

The intersection includes multiple turning and through lanes, wide medians, and service roads. However, recurring traffic congestion is observed, particularly near daladala bus stops during peak hours. Approximately 560 metres from the intersection is the 30 metre-long Mlalakuwa Bridge, which also influences traffic flow in the area.

Mwenge Intersection serves as a critical node within the planned BRT Phase 4 corridor, extending from the Central Business District (CBD) to Tegeta via Ali Hassan Mwinyi Road, Morocco, and Mwenge, with a branch connecting to Ubungu through Sam Nujoma Road. Within this corridor, three BRT stations are proposed in the area: Suma Junction, Mwenge/ITV, and Mwenge Terminal Stations.

Between 2016 and 2019, TANROADS conducted a feasibility study and detailed design for grade separation at Mwenge, assessing various alternatives including flyovers and underpasses. Although an initial proposal for a four-lane flyover combined with an underpass was considered, the underpass option was subsequently abandoned due to land acquisition constraints. A revised study in 2023 recommended twin two-lane flyovers along New Bagamoyo Road as the most practical and effective solution. However, TANROADS expressed concerns regarding horizontal alignment and pier placement. The proposal, nevertheless is supported by DART and aligns with the planned BRT network.

(2) Morocco Intersection

Morocco Intersection is a major four-leg signalized intersection connecting New Bagamoyo Road, Ali Hassan Mwinyi Road, Kawawa Road, and Mwai Kibaki Road (formerly Old Bagamoyo Road). Both New Bagamoyo Road and Ali Hassan Mwinyi Road serve as primary four-lane arterial routes between the city center and suburban zones, while Kawawa Road forms a four-lane ring road incorporating dedicated BRT Phase 1 lanes. Mwai Kibaki Road serves as a secondary, parallel route.

Situated along the BRT Phase 4 corridor, Morocco Intersection will be served by two new BRT stations – Makochi and Morocco– and already hosts an existing BRT Phase 1 terminal, a daladala feeder terminal, and the Morocco Square commercial complex.

Road sections around the intersection have been upgraded through Japan’s Grant Aid projects, including New Bagamoyo Road (2018–2021) and Kawawa Road (1998–2000). The intersection features multiple turning and through lanes, wide medians, and service roads, with two outbound lanes generally provided on each approach.

In 2019, TANROADS conducted a study recommending a four-lane flyover combined with an underpass; however, the underpass option was abandoned due to land acquisition constraints, similar to the situation at Mwenge Intersection. A revised study in 2023 proposed twin two-lane flyovers along New Bagamoyo Road as the most viable and practical solution. While TANROADS raised concerns regarding curved alignments and pier locations, the plan is supported by DART as part of the wider BRT development strategy.

(3) Buguruni Intersection

Buguruni Intersection is a busy four-leg signalized intersection where Nelson Mandela Road, Uhuru Street, and Mnyamani Road meet. It is located near the TAZARA Intersection and an at-grade railway crossing on the Central Railway, operated by the Tanzania Railway Corporation. At this crossing, the SGR viaduct has been constructed in parallel with the Central Railway. Significant congestion occurs in this area, particularly around large daladala bus stops during peak hours. Despite the presence of multiple lanes and service roads, disorganized public transport operations often contribute to traffic bottlenecks.

Nelson Mandela Road features a 50 m right-of-way (ROW), with two outbound lanes and up to three approach lanes at the intersection. Uhuru Street begins as a four-lane road for approximately 1.1 km, before narrowing to two lanes further along. Mnyamani Road is a narrow two-lane road serving densely populated residential areas, including Vingunguti, Tabata and Segerea. The intersection lies on the alignment of the BRT Phase 3 and Phase 5 corridors and is planned to include three BRT stations: Uhuru Street, Buguruni, and Nyerere Road South Stations.

In 2019 study, TANROADS proposed a Y-shaped flyover and a right-turn underpass tunnel; however, the underpass was later abandoned due to land acquisition constraints. A revised study in 2023 recommended twin two-lane flyovers along Nelson Mandela Road as the most practical option. TANROADS highlighted the need of improving horizontal alignment and relocating piers away from the intersection to enhance safety and manoeuvrability. The revised proposal received endorsement from DART, aligning with the city's broader BRT network development plans.

(4) TAZARA Intersection

The TAZARA Intersection is located approximately 600 m south of Buguruni Intersection and serves as a key junction connecting Nelson Mandela Road and Nyerere Road. A 425 m-long flyover along Nyerere Road, known as the TAZARA Flyover or Mfugale Flyover, was constructed between 2016 and 2018 under Japan's Grant Aid programme.

At this location, Nelson Mandela Road provides three to four lanes per direction, with median widths varying between 1.5 m and 5.0 m and service roads provided on one or both sides. Several daladala stops are located nearby, including one on the Buguruni side that frequently contributes to traffic congestion. The Mfugale Flyover includes two lanes in each direction, supported by two-lane frontage roads and sidewalks. A 12 m-wide median was reserved for the BRT Phase 3 corridor. No further improvements to the intersection were proposed in the previous TANROADS study.

4. Traffic Demand Forecast

This survey estimated future traffic demand at the four key intersections – Mwenge, Morocco, Buguruni, and TAZARA – using the present pattern method (Fratat method), based on updated traffic assignment models from the 2018 Revised Master Plan. Traffic forecasts for 2023 and 2043 were developed by calculating inflow/outflow volumes using growth rates derived from the updated road network and origin-destination (OD) matrices. For purposes of economic evaluation, additional traffic forecasts were also prepared for 2050.

Traffic surveys included 16-hour directional counts at the intersections, 24-hour counts on adjacent road sections, and travel speed surveys. Due to inconsistencies identified in the July 2023 survey, supplementary counts were undertaken in October 2023 to ensure accuracy. The final forecasts incorporate the results of these revised counts.

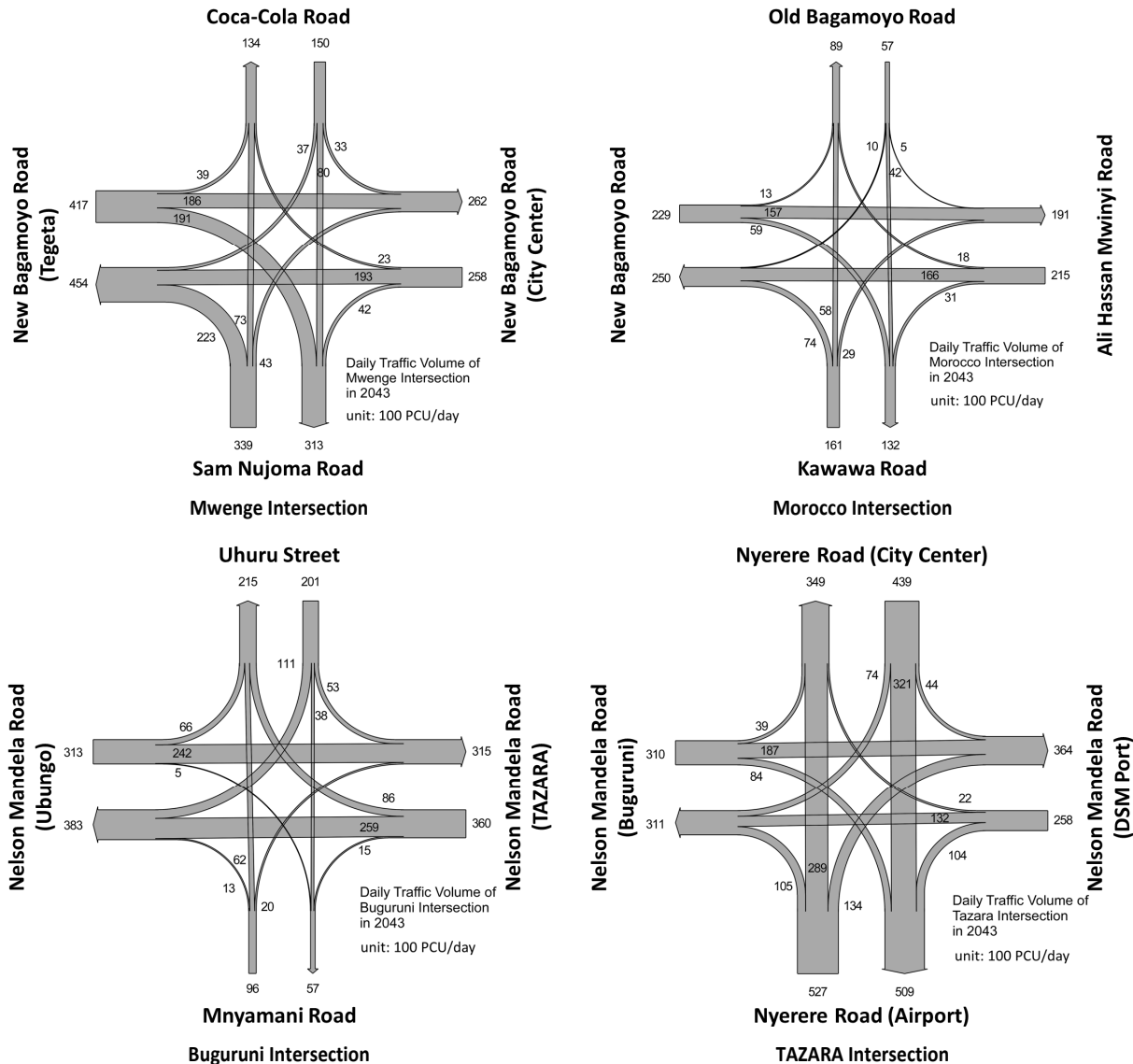
Future traffic demand estimates take into account ongoing and planned transport infrastructure developments. It is assumed that BRT Phases 1-6 will be operational by 2030, while the construction of the Middle and Outer Ring Roads – both targeted for completion by 2040 – has also been factored into the network model. Although the Standard Gauge Railway (SGR) commenced operations in 2024, its impact on the studied intersections is expected to be limited, as most freight traffic is anticipated to shift to the ring roads. The Bagamoyo Port project was excluded from the model due to absence of confirmed development plans.

Traffic demand models from the 2018 Revised Master Plan were updated with 2023 and 2043 OD data and applied to the revised road network for traffic assignment. The resulting traffic volumes were used to calculate vehicle-type-specific growth rates, which were applied to current intersection traffic data to estimate future directional turning flows. The Fratrat method was used to reconcile projected inflow/outflows with directional turning volumes. Additionally, peak-hour traffic forecasts for 2043 and 2053 were produced using the existing peak-hour traffic ratios.

Analysis of the heavy vehicle traffic, particularly trailers, is more prominent at Buguruni and TAZARA Intersections. On major radial arterial roads such as New Bagamoyo Road and Nyerere Road, traffic

volumes exhibit directional peaking— inbound flows toward the CBD in the morning and outbound flows in the evening. By contrast, ring roads such as Kawawa Road and Nelson Mandela Road demonstrate a more balanced directional distribution.

The forecasts also indicate a modal shift from conventional bus services to the BRT network, resulting in reduced volumes of conventional buses on BRT corridors by 2043. However, as BRT services operate on dedicated segregated lanes, their volumes have been excluded from the intersection demand estimates.



Note: BRT is excluded. Unit: 100 PCU/day
 Source: JICA Survey Team

Figure 4.1 Directional Daily Traffic Volume in 2043

5. Natural Conditions Survey

(1) Meteorological Conditions

Dar es Salaam, located on Tanzania’s eastern coast, has a tropical savanna climate with consistently high temperatures and humidity throughout the year. The city experiences a wet season from November to May and a dry season from June to October, with rainfall particularly concentrated between March and May. Meteorological data is mainly collected by the Tanzania Meteorological Agency (TMA), with key reference data recorded at Julius Nyerere International Airport.

The average annual temperature is 26.0°C, with a recorded maximum of 34.1°C and a minimum of 17.4°C. Long-term climate analysis shows a gradual rise in temperature, particularly in minimum temperatures. By 2123, the mean temperature is projected to increase by 1.59°C. Based on a 120-year return period, the design temperature range for infrastructure is set at 26°C ± 10°C.

Relative humidity remains high year-round, averaging 77.3%. Rainfall data indicates increasing trends in 24-hour maximum rainfall events, though the statistical reliability is low. Gumbel distribution analysis shows a strong fit for rainfall data, providing a sound basis for hydrological design, although short-duration rainfall data is lacking.

Wind data reveals a maximum observed speed of 15.4 m/s at Julius Nyerere International Airport. A design wind speed of 18.1 m/s (gust wind speed of 34.4 m/s) was calculated for a 50-year return period using Gumbel distribution, aligning with British Standards. Strong winds, defined as speeds above 10 m/s, occur frequently and may affect construction workability.

(2) Natural Disasters

Dar es Salaam is exposed to various natural hazards, although the risk level for most is relatively low. Earthquake activity in Tanzania is associated with the East African Rift System. The most significant earthquake recorded near Dar es Salaam occurred in 2020, with a magnitude of 6.0; however, no major damage was reported. The Ministry of Lands classifies Dar es Salaam as Zone 1, indicating weak and infrequent seismic activity. The 2018 Global Earthquake Model (GEM) revised the city's seismic risk, estimating a peak ground acceleration (PGA) of 0.09 m/s² for a 475-year return period – three times higher than the 1999 GSHAP value. These updated figures will be used to guide the elastic response spectrum for structural design.

Tsunami risk is considered low. While the 2004 Sumatra Earthquake generated a tsunami that reached the region, no damage was recorded in Dar es Salaam. Historical accounts mention only one possible tsunami event along the Pangani River, which had no impact on the city.

Cyclones rarely affect Dar es Salaam due to its position relative to cyclone formation zones in the Southwest Indian Ocean. Only two cyclones, in 1872 and 1952, have been recorded to reach the city, with no significant consequences. Cyclone Jobo (2021) dissipated before landfall, reinforcing the city's low cyclone risk classification.

Flooding poses the most substantial natural hazard. Since the late 2000s, Dar es Salaam has experienced almost annual flood events, particularly in the Msimbazi Basin. Key mitigation measures include land-use changes, the promotion of green infrastructure, and drainage system upgrades. While heavy rainfall may impact areas near the Mwenge, Morocco, and Buguruni intersections, flood hazard maps suggest that direct impacts on these project sites are minimal.

(3) Hydrological Conditions

Due to the absence of short-duration rainfall data, the development of Intensity-Duration-Frequency (IDF) curves for Dar es Salaam requires the use of interpolation or calibration techniques. A review of existing studies revealed various methodologies for establishing IDF curves. Among these, the methodology adopted in TANROADS's 2019 study of eight critical intersections yielded the most conservative rainfall intensity estimates. Consequently, this methodology – based on Bell's ratio and incorporating a Gumbel distribution fit to recent rainfall data – was selected for IDF curve calculation in this survey.

The drainage system in Dar es Salaam faces significant challenges, largely due to rapid urban growth, insufficient infrastructure, and intense seasonal rainfall. Stormwater drainage is managed locally at the ward

level, resulting in fragmented oversight. To address this, the Ramani Huria project has been instrumental in mapping the city's drainage infrastructure through a community-based initiative. Originally launched through collaboration between the Humanitarian OpenStreetMap Team, Ardhi University, and the Tanzanian Commission for Science and Technology, the project later received support from the World Bank, GFDRR, and the UK Urban Resilience Programme. This initiative aims to strengthen flood risk management and enhance overall urban resilience.

(4) Topography

Dar es Salaam's terrain is characterized by two main regions: a low-lying coastal plain and an inland plateau. Elevations range from less than 5 m above sea level near the coast to hilly areas reaching up to 150 m. Most urban settlements are located on gentle terraces or flatlands between 5 and 20 m elevation. The city's landforms include shorelines with sand dunes and swamps, a limestone coastal plain with sandy soils, inland alluvial plains dissected by U-shaped valleys, and steep hills in the western region. Dar es Salaam is divided into four major river catchments – Mpiji, Msimbazi, Mzinga, and Kizinga. Among these, Msimbazi, Mzinga, and Kizinga are perennial rivers that support domestic, industrial, and agricultural water needs, while Mpiji is seasonal and less polluted.

Digital topographic data with high resolution (AW3D 0.5 m DTM and 0.3 m orthophoto) were used to assess site conditions. Coastal terraces in the region are classified into three elevation zones: Motoni Plain (0–15 m), Tanga Plain (15–40 m), and Sakura Plain (60–100 m). The Mwenge, Morocco, and Buguruni intersections are located on the Tanga Plain at elevations of 27 m, 16 m, and 35 m respectively. These intersections lie on relatively flat terrain without nearby steep slopes, indicating minimal risk of slope failure or landslides.

At each intersection, gradual elevation changes are observed along the surrounding roads, consistent with the overall flatness of the terrain. The Buguruni intersection shows the most notable elevation variation, particularly near the Msimbazi River. Overall, the topography around the candidate intersections presents favourable conditions for infrastructure development without significant geological constraints.

(5) Geology

Dar es Salaam lies within a coastal sedimentary basin characterized by Cenozoic to Mesozoic formations, including sandstone, limestone, and clay. Soils in the area range from sandy loam in upland regions to poorly drained clay and loam in lowlands. Terrace zones primarily consist of semi-consolidated white-buff sand interbedded with clay, extending over 100 m in some areas.

At Mwenge Intersection, geotechnical investigations revealed sand and clayey sand as the dominant soils, with cohesive soils found only in isolated locations. A bearing layer with $N \geq 30$ is found at a depth of 6-7 m near the center of the intersection, but this depth increases towards both Tegeta and the city centre. High-quality bearing layers ($N \geq 50$) typically appear below 15-18 m. Groundwater levels range from 1-5 m below the ground surface.

At Morocco Intersection, soil conditions are more complex. Predominantly sandy soils are found near the intersection, while cohesive soils and coral gravel are found further away. Bearing layers ($N \geq 30$) appear at depths of 5-13 m near the center and deepen towards the periphery. High-quality bearing layers vary significantly in depth ranging from GL-5 m to GL-30 m. Groundwater is generally shallow (1-4 m), though deeper levels are observed in some areas.

At Buguruni-TAZARA Intersections, soils comprise fine sand mixed with clay and gravel. The bearing layer typically lies below 12-13 m, but in one location is found as shallow as 7 m. A notable geotechnical concern is a weak layer (N-values of 9–24) found within the bearing strata, likely representing a regional

anomaly. Despite this, the required pile support depth is achievable. On Uhuru Street, bearing layers ($N \geq 30$) appear below 10-12 m, with strong layers ($N \geq 50$) at 10-22 m depth. Groundwater is estimated at approximately EL+20 m, influenced by proximity to the Msimbazi River.

6. Examination of Project Scope

This survey was undertaken to determine the most appropriate type of grade separation for each target location and to identify two intersections for priority implementation under the Japanese ODA loan scheme. The selection process took into account technical feasibility, anticipated traffic improvement, land acquisition and resettlement requirements, integration with the BRT system, and overall cost effectiveness.

The examination comprised two stages. In the first stage, the optimal grade-separation type for each intersection was identified by developing multiple structural alternatives and evaluating them against a range of technical, economic, and social criteria. These included congestion mitigation potential, safety for vehicles and pedestrians, construction period, traffic impacts during the works, social and environmental implications, construction cost, ease of maintenance, compatibility with the surrounding landscape, and potential for future expansion. The Analytic Hierarchy Process (AHP) was employed as a multi-criteria decision-making tool to facilitate consensus building, with weightings derived from a questionnaire survey of TANROADS officials.

The second stage compared the preferred alternative for each intersection to establish the implementation priority. This comparison considered the expected scale of congestion reduction, preliminary cost estimates, the extent of land acquisition and resettlement, and the degree of coordination required with the BRT project. The AHP method was not applied in this stage, as its scoring framework is not suitable for cross-intersection comparisons.

(1) Mwenge Intersection

At Mwenge Intersection, four flyover-based alternatives were examined. The underpass option was excluded due to concerns over drainage maintenance, the need for mechanical pumping in flat terrain, and the vulnerability to frequent power outages.

Table 6.1 Alternative Options for Mwenge Intersection

Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>Parallel flyovers for through traffic on New Bagamoyo Road</p> <p style="text-align: right;">LEGEND █ Flyover</p>	<p>Y-shaped flyover for through traffic on New Bagamoyo Road from Tegeta to CBD, and right turn traffic to Sam Nujoma Road (Ubungo)</p> <p style="text-align: right;">LEGEND █ Flyover</p>	<p>Alternative 2 plus additional flyover for through traffic on New Bagamoyo Road from CBD to Tegeta</p> <p style="text-align: right;">LEGEND █ Flyover</p>	<p>Double Flyover for through traffic on New Bagamoyo Road and Sam Nujoma Road</p> <p style="text-align: right;">LEGEND █ Flyover</p>
		Recommended	

Source: JICA Survey Team

Alternative 3, which provides dual flyovers on New Bagamoyo Road in both directions and relocates the planned BRT station closer to the intersection, was selected as the most appropriate. This configuration offers the highest level of congestion reduction and significantly improves pedestrian safety by integrating

station access with pedestrian crossings. The land acquisition requirement is modest, much of which may already be secured under the BRT Phase 4 project, and the resettlement impact is limited primarily to the temporary Wamachinga market.

(2) Morocco Intersection

At Morocco Intersection, five alternatives were assessed, comprising both flyover and underpass options. The gently sloping terrain at this location permits an underpass solution without the need for mechanical drainage systems.

Table 6.2 Alternative Options for Morocco Intersection

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
<p>Parallel flyovers along New Bagamoyo Road and Ali Hassan Mwinyi Road by retaining the proposed BRT station locations to be constructed under the BRT Phase 4 project</p>	<p>Parallel flyovers along New Bagamoyo Road and Ali Hassan Mwinyi Road by optimizing the proposed BRT station locations to be constructed under the BRT Phase 4 project</p>	<p>Parallel underpass along New Bagamoyo Road and Ali Hassan Mwinyi Road by retaining the proposed BRT station locations to be constructed under the BRT Phase 4 project</p>	<p>Parallel underpass along New Bagamoyo Road and Ali Hassan Mwinyi Road by optimizing the proposed BRT station locations to be constructed under the BRT Phase 4 project</p>	<p>Parallel flyovers along New Bagamoyo Road and Ali Hassan Mwinyi Road by shifting the proposed BRT station locations to be constructed under the BRT Phase 4 project</p>
				Recommended

Source: JICA Survey Team

Alternative 5, which proposes parallel flyovers along New Bagamoyo and Ali Hassan Mwinyi Roads with adjusted BRT station locations, was selected as the most suitable configuration. This option minimizes changes to the BRT plan, allows continuous traffic diversion during construction, requires comparatively low levels of land acquisition, and offers the lowest construction cost of all alternatives considered for Morocco. The principal challenge is the need to relocate the TANESCO substation to secure the necessary road width, requiring close coordination with TANESCO.

(3) Buguruni-TAZARA Intersections

The Buguruni-TAZARA Intersections were evaluated through four continuous grade-separation alternatives, comprising either flyovers or underpasses across three intersections: Buguruni, the Central Railway and the SGR viaduct, and TAZARA Intersection.

Table 6.3 Alternative Options for Buguruni-TAZARA Intersections

Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>Parallel Flyovers along Nelson Mandela Road at Buguruni Intersection</p>	<p>Continuous Parallel Flyovers along Nelson Mandela Road passing over 3 intersections (Buguruni, SGR and TAZARA Intersections)</p>	<p>Continuous Parallel Underpass along Nelson Mandela Road passing under 3 intersections (Buguruni, SGR and TAZARA Intersections) w/o Drainage Pump</p>	<p>Continuous Parallel Underpass along Nelson Mandela Road passing under 3 intersections (Buguruni, SGR and TAZARA Intersection) with Drainage Pump</p>
	Recommended		

Source: JICA Survey Team

Alternative 2, a continuous parallel flyover spanning all three intersections, was identified as the most viable in terms of construction duration, traffic management during implementation, and reduced land requirements compared with other alternatives. However, this option still necessitates significant land acquisition and resettlement along the corridor – a scale of displacement that TANROADS intends to minimise. Furthermore its congestion mitigation effect at TAZARA is limited due to the high volumes of right-turn traffic. Consequently, this alternative was classified a lower priority within the current loan scope.

(4) Selection of Intersections

The comparative analysis confirmed Mwenge Intersection as the highest priority, providing substantial congestion relief, moderate cost, and minimal resettlement risk. Morocco Intersection ranked second, offering a balance between traffic improvement and cost efficiency, while presenting manageable challenges primarily related to utility relocation. Although the Buguruni-TAZARA corridor would yield network-wide benefits, it was deprioritized due to the significant social cost associated with large-scale resettlement and its comparatively limited impact at one of the key intersections.

Preliminary cost estimates place the Mwenge project at approximately ██████████ and the Morocco project at around ██████████, both substantially below the ██████████ estimated for Buguruni-TAZARA. These cost levels, together with their respective benefits and implementation challenges, informed the decision to advance Mwenge (Alternative 3) and Morocco (Alternative 5) to the next stage of preparation under Japanese ODA loan financing. This prioritization was agreed upon through discussions between the Government of Tanzania and JICA, and remains subject to confirmation within the overall loan ceiling and the Government’s borrowing capacity.

Table 6.4 Priority Evaluation of Intersections

	Mwenge Intersection (Alternative 3)	Morocco Intersection (Alternative 5)	Buguruni-TAZARA Intersections (Alternative 2)
Traffic Improvements	Most effective in reducing traffic congestion	Effective in reducing traffic congestion	Congestion reduction expected but not sufficient
Preliminary Construction Cost	██████████	██████████	██████████
Land Acquisition	Approx. 1,500 m ²	Approx. 1,000 m ²	Approx. 2,500 m ²
Resettlement	Relocation of Wamachinga Market is required, but the scale of the challenge for project implementation is small.	Relocation of TANESCO’s transformer substation is required, and the scale of the challenge for project implementation is medium.	Many small houses along Nelson Mandela Road need to be relocated, and the scale of the challenge for project implementation is quite large.
Coordination with BRT Project	Relocation of the proposed BRT Stations under the BRT Phase 4 is required, but the scale of the challenge for project implementation is small.	Same as on the left.	No changes to BRT plans required.
Evaluation	Highest Priority for project Implementation	Second Priority for project Implementation	

Note: The above estimated construction costs are based on the tentative unit prices, which are valid only for the comparative study of alternatives and the selection of intersections for the Japanese ODA loan project, and are not the final cost estimates of the study.

Source: JICA Survey Team

7. Preliminary Design

Following the alternative analysis, the preliminary designs were developed for road geometry, intersections, and grade-separated structures at Mwenge and Morocco Intersections.



Mwenge Intersection

Morocco Intersection

Source: JICA Survey Team

Figure 7.1 Grade Separation at Mwenge and Morocco Intersections

(1) Road and Intersection Design

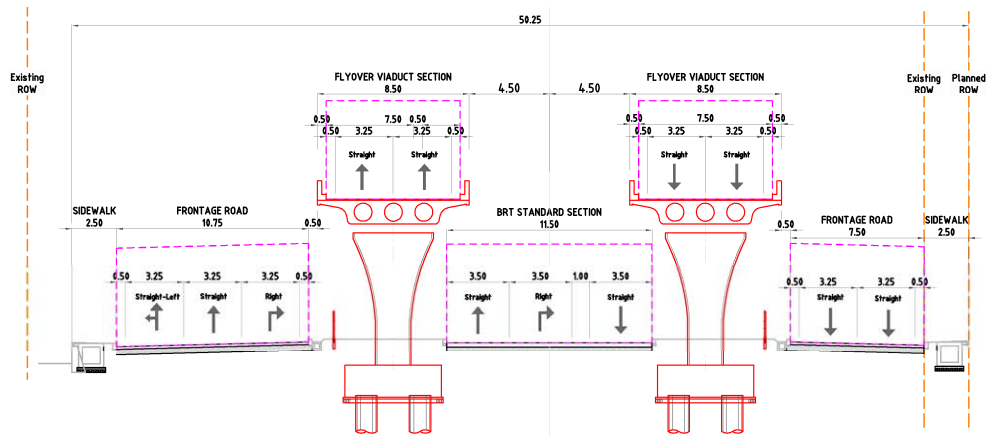
The road geometric designs are based primarily on Tanzania's Road Geometric Design Manual (2011), supplemented by the U.S. AASHTO's A Policy on Geometric Design of Highways and Streets (2018) and Japan's Road Structure Ordinance (2015) for elements not covered by Tanzanian standards.

The project adopts a target year of 2043, aligned with the 20-year practical planning horizon, with future traffic demand estimated using the 2018 Revised Master Plan and 2023 traffic counts. At the request of the Government of Tanzania, additional verification was undertaken for 2053 volumes, 20 years after completion. Capacity analysis confirmed that two lanes per direction on the flyovers will be sufficient for 2053, although widening of mainline sections outside the intersections may be necessary in the future.

The design speed was set at 60 km/h for straight flyovers and 40 km/h for the right-turn flyover at Mwenge due to space constraints. These speeds are consistent with previous grade-separation projects in Dar es Salaam and observed operating speeds of 40–50 km/h in the area. Lane width is set at 3.25 m, narrower than Tanzania's 3.5 m standard, in line with other urban flyovers in Dar es Salaam and Japanese standards, enabling the total width to be accommodated within constrained ROW. Frontage roads will have two lanes per direction regardless of traffic demand, shoulders are set at 0.5 m, and BRT lanes retain a width of 3.5 m. Vertical clearance of 5.5 m is maintained throughout.

Mwenge Intersection

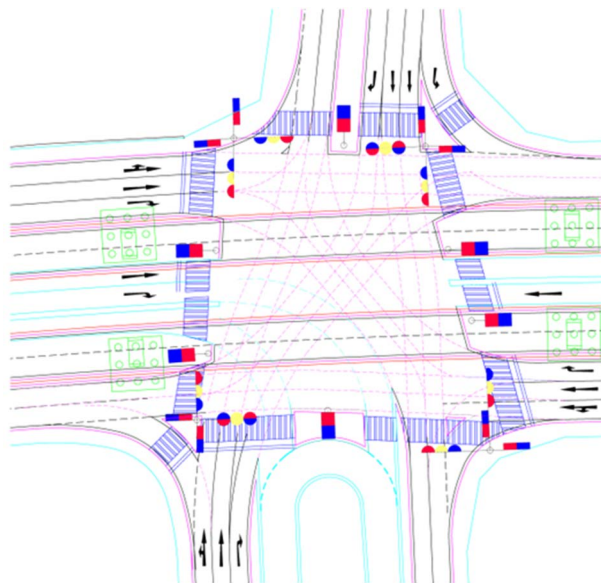
The ROW of New Bagamoyo Road at this location ranges from 60-70 m. To fit within existing limits, the road centreline was aligned accordingly, necessitating adjustments to BRT lane positioning under Phase 4. A design speed of 40 km/h allows a smaller curve radius of 75 m for the right-turn flyover, avoiding major structural constraints. Safety measures include a 200 m deceleration lane, improved visibility through vertical alignment design, extended median separators to manage merging movements, and additional signage. Both through and right-turn flyovers are designed as two lanes facilities, in line with TANROADS policy.



Source: JICA Survey Team

Figure 7.4 Typical Cross Section at Morocco Intersection

As with Mwenge, visibility and pedestrian safety are prioritized. Traffic islands provide safe waiting areas for pedestrians crossing the 46 m crosswalks. Capacity analysis shows demand ratios of 0.64 (AM peak) and 0.56 (PM peak), confirming sufficient capacity. The lane configurations allow for shared through/left-turn lanes and dedicated right-turn lanes on the major approaches, while minor roads retain their existing configurations.



Purple Line: Vehicle trajectory on service roads
 Blue Line: BRT vehicle trajectory

Source: JICA Survey Team

Figure 7.5 Intersection Plan at Morocco Intersection

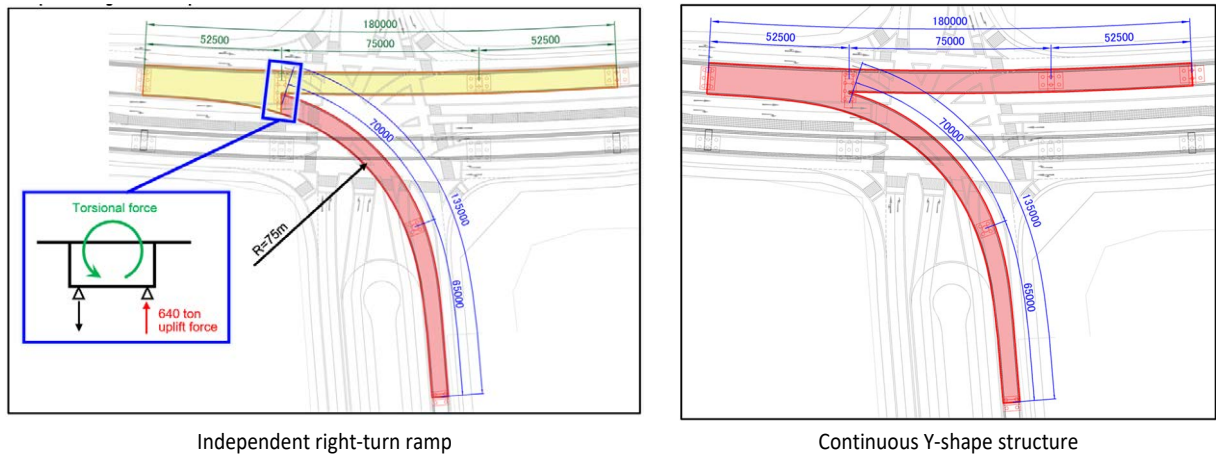
(2) Grade Separated Structure Design

The structural design adopts British Standard BS 5400 as the primary code, with supplementary reference to the Eurocode and Japan’s Specifications for Highway Bridges (2017).

Mwenge Flyover

The Mwenge flyover comprises a second-layer CBD-bound main bridge, a Y-shaped right-turn ramp, and a third-layer Tegeta-bound main bridge.

For the CBD-bound second-layer bridge, main piers are positioned 5 m behind the stop line to secure driver and pedestrian visibility, thereby enhancing intersection safety. Span lengths are 75 m for the straight section with 52.5 m side spans (total length of 180 m) and 70 m for the right-turn ramp with a tight 75 m curve radius. Analysis showed that a two-span separated structure would generate large negative reaction forces at the supports, requiring costly countermeasures and potentially exceeding substructure capacity. A three-span continuous Y-shaped configuration was therefore adopted, eliminating negative reactions and maintaining manageable stress levels.



Source: JICA Survey Team

Figure 7.6 Comparison of Independent Structure and Continuous Structure

For ~75 m spans, three superstructure options – steel box girder, narrow-width steel box girder, and PC box girder – were compared. PC box girders were excluded for the second-layer bridge due to the high-risk cantilever erection required on a tight curve in a heavily trafficked intersection. Between the two steel box girder options, the standard steel box girder was recommended for its economic efficiency, proven constructability, and maintenance reliability. A steel-concrete composite slab was selected to shorten construction time and enhance construction safety. Corrosion protection will employ a heavy-duty corrosion-resistant painting system rather than weathering steel, ensuring long-term durability, aesthetics, and suitability for coastal conditions.

The Tegeta-bound third-layer mainline also uses ~75 m spans but with a 1,400 m curve radius, enabling incremental launching for steel girders and safer cantilever erection for PC girders. In this case, the PC box girder was selected for its cost advantage and minimal disruption to traffic during construction. Approach bridges were evaluated in three configurations – PC hollow slab, steel plate girder, and PC T-girder. The PC hollow slab (4 × 30 m) was chosen for its economy and local constructability.

Table 7.1 Alternative Options for Bridge Types (Mwenge Intersection: 2nd Layer)

Alternative 1 Steel Box Girder	Alternative 2 Steel Narrow Box Girder
Recommended	

Source: JICA Survey Team

Table 7.2 Alternative Options for Bridge Types (Mwenge Intersection 3rd Layer)

Alternative 1 Steel Box Girder	Alternative 2 Steel Narrow Box Girder	Alternative 3 PC Box Girder
		Recommended

Source: JICA Survey Team

Table 7.3 Alternative Options for Bridge Types (Approach Section)

Alternative 1 PC Hollow Slab Girder	Alternative 2 Steel Plate Girder	Alternative 3 PC T-Girder
Recommended		

Source: JICA Survey Team

Inverted T-type abutments were selected for cost efficiency and maintenance access, maintaining a minimum 2 m clearance under girders. Pier designs were assessed for both aesthetics and cost, with curved-shape piers selected for most locations. At the Y-branch pier over the BRT lanes, a rigid-connection steel pier will be used to control vertical alignment height and avoid excessive bridge lengthening. Foundation design requires deep bearing capacity (15-25 m), and the cast-in-place pile method was selected as the most practical and widely used solution in Tanzania.

Morocco Flyover

The Morocco flyover design applies the same fundamental principles as Mwenge. Pier placement provides a 75 m main span with 52.5 m side spans, resulting in a total main bridge length of 180 m. As with Mwenge’s third-layer structure, a PC box girder was selected for the main bridge due to its cost efficiency and ability to be constructed without imposing traffic restrictions. PC hollow slab bridges were adopted for the approach sections.

Abutments use the Inverted T-type configuration, while T-shaped piers were chosen to balance cost considerations with visual harmony in the urban context. The bearing layer depth is similar to Mwenge (15-25 m), supporting the adoption of the cast-in-place pile method as the preferred foundation solution. The total bridge length for the Morocco Flyover is 360 m.

(3) Pavement Design

The pavement design for the Mwenge and Morocco intersections was prepared in accordance with Tanzania’s Pavement and Materials Design Manual (1999) as the primary standard, supplemented by the AASHTO Guide for Design of Pavement Structures (1993) and the Guidelines for Design and Construction of Pavement (Japan Road Association).

Design parameters were updated using traffic data from the 2023 survey and demand forecasts for 2043 and 2053. Given its higher traffic volume, the Mwenge Intersection was used as the design basis. Equivalent Single Axle Loads (ESAL) were calculated for 15- and 20-year design periods, assuming service commencement in 2032, and applying Vehicle Equivalent Factors (VEF) by vehicle type. Both design periods fall within load classification TLC50 of the Tanzanian standards (20×10^6 to 50×10^6 ESAL), consistent with the classification used in the New Bagamoyo Road Widening Project.

Based on California Bearing Ratio (CBR) test results from the earlier project, the subgrade CBR was set at 10. To ensure proven performance under similar traffic and soil conditions, the same pavement structure as the New Bagamoyo Road Widening Project was adopted.

(4) Roadside Facility Design

The roadside facility design for the Mwenge and Morocco intersections focuses on integrating the new flyover structures with existing infrastructure, enhancing safety, and ensuring efficient traffic control.

Both intersections are already served by established drainage systems, including a $1.0 \text{ m} \times 1.0 \text{ m}$ covered channel on New Bagamoyo Road constructed under Japan's Grant Aid. As the project involves limited road works, new drainage facilities for the flyovers will connect directly to the existing network, with no major system modifications required.

To address current deficiencies and improve pedestrian and vehicular safety, the project will provide:

- Guardrails around lighting poles, intersections, and traffic islands.
- Deceleration marks and dot lines on the steep (7.0%) right-turn flyover exit.
- Rumble strips in shoulder-widened curve sections to prevent run-off accidents.
- Warning signs at intersections, crosswalks, and S-curves.
- Continuous roadway lighting at ground and elevated levels to improve visibility and deter crime.

Road signage will be designed for clarity and safety, with guidance, regulatory, and warning signs placed at merge/diverge points, intersection approaches, and crosswalks. Traffic signals for vehicles and pedestrians will be positioned to ensure clear visibility from safe stopping distances and to avoid misinterpretation.

Lighting design will provide consistent illumination along the full length of the project roads, prioritizing intersections and high-risk areas. Energy-efficient LED fixtures will be installed, with consideration for ease of maintenance and regular cleaning.

8. Construction Plan & Preliminary Cost Estimation

(1) Construction Plan

The construction works of the Project will be executed through carefully sequenced activities designed to minimize disruption, particularly to BRT operations and high-volume urban traffic. Preparatory activities will include the establishment of camp yards, installation of temporary fencing, and utility relocation. Temporary two-lane diversion roads will be constructed within the available ROW to maintain continuous traffic flow.

Substructure works will commence with the installation of cast-in-place bored piles ($\phi 1,200 \text{ mm}$) using the all-casing method, with strict space management to protect BRT operations. Where clearance is limited, earth-retaining sheet piles will be installed at night under temporary traffic restrictions. Excavated material will be reused as backfill wherever possible, compacted in controlled layers. Abutments and piers will be constructed using pumped concrete, incorporating rigid connection details where required over BRT lanes.

Superstructure works will vary by structure type. Steel box girder bridges will be erected using the crane-bent method, requiring the mobilisation of large-capacity cranes from abroad and short nighttime closures for girder placement. PC box girder bridges will be constructed by the balanced cantilever method, with limited lane closures for material delivery. PC hollow slab approach spans will be cast on full falsework, with tailored support systems where BRT lanes run beneath.

Road works will include L-shaped retaining walls, cement-stabilized subbase, asphalt base and surface layers, and binder courses, constructed with appropriate priming and tack coats. Roadside facilities will comprise precast side ditches, U-drains, guardrails, and traffic signals, installed with localized excavation and lifting equipment.

Throughout construction, measures will be implemented to safeguard pedestrian and vehicular movement, maintain BRT clearance, and optimize work zones. Nighttime operations, phased traffic management, and material reuse strategies will minimise public inconvenience and environmental impacts, while ensuring safety, efficiency, and quality throughout the project.

The overall construction period is estimated at 42 months for the Mwenge Intersection and 35 months for the Morocco Intersection.

(2) Preliminary Cost Estimation

The preliminary cost estimation was prepared in accordance with JICA's Design and Cost Estimation Manual for Preparatory Surveys (2009) and its 2023 civil engineering supplement, applying unit prices derived from Japanese and Tanzanian standards. Exchange rates applied were 1 USD = 151.00 JPY, 1 USD = 2,450 TZS. The estimate excludes all taxes, including VAT and import duties.

Direct construction costs were calculated by multiplying preliminary design quantities by unit prices, which were developed from detailed breakdowns of labour, materials, and equipment. Indirect costs include common temporary works, site management, and administrative expenses. The preliminary construction costs are estimated at ██████████ for Mwenge and ██████████ for Morocco, for a combined total of ██████████. The estimates, are broken down into 13 major work categories, ensuring a transparent cost basis for budgeting. These figures will be refined during the detailed design stage to reflect updated quantities, market conditions, and final specifications.

9. Economic Evaluation

A Cost Benefit Analysis (CBA) was conducted for the Project, comparing a "With Project" scenario involving grade-separated flyovers to a "Without Project" scenario, while accounting for the modal shift associated with the BRT projects. The evaluation applied a 12% discount rate and a 30-year project life (2024–2054), in line with standard methodologies, and assessed Net Present Value (NPV), Economic Internal Rate of Return (EIRR), and Benefit-Cost Ratio (BCR).

The total construction costs were estimated at ██████████ for Mwenge and ██████████ for Morocco, with additional annual and periodic operation and maintenance costs. Project benefits were primarily derived from vehicle travel time savings, calculated using microscopic traffic simulation models based on vehicle classifications and future traffic demand scenarios.

By 2040, annual monetary benefits from time savings are projected to reach TZS 126.1 billion at Mwenge and TZS 67.7 billion at Morocco. The economic performance indicators confirm strong project feasibility: Mwenge Intersection yields an EIRR of 21.3%, NPV of TZS 161.2 billion, and BCR of 2.16, while Morocco Intersection shows an EIRR of 27.5%, NPV of TZS 169.4 billion, and BCR of 3.33. Combined, the intersections achieve an EIRR of 23.6%, NPV of TZS 330.6 billion, and BCR of 2.56.

Sensitivity analysis demonstrates that both projects remain economically viable under $\pm 10\%$ variations in cost and benefit assumptions. The findings confirm that the proposed interventions represent sound investments, delivering substantial economic benefits through reduced congestion, improved traffic flow, and enhanced transport efficiency.

10. Environmental and Social Impact Assessment

This survey assessed the potential environmental and social impacts of the Project in accordance with JICA's Guidelines for Environmental and Social Considerations (2022), applicable Tanzanian environmental legislation, and the World Bank's Environmental and Social Framework. The evaluation covered all phases of the project – pre-construction, construction, and operation – within a densely developed urban corridor characterized by heavy traffic, active commercial areas, and limited open space. Although no ecologically sensitive areas are located within the project footprint, the sites include markets, roadside businesses, and residential areas whose livelihoods depend heavily on road access.

In compliance with Tanzanian law, an Environmental Impact Assessment (EIA) is required for projects of this scale, administered by the National Environment Management Council (NEMC). The projects must also comply with regulations governing land acquisition, resettlement, occupational health and safety, and heritage protection. Effective coordination with local governments, and DART – the BRT operator – will be critical to ensure integration with ongoing transport infrastructure development.

Baseline surveys confirmed the presence of established drainage infrastructure, notably a covered drainage channel along New Bagamoyo Road constructed under Japan's Grant Aid, and verified the absence of natural habitats of special concern. Anticipated pre-construction impacts include limited land acquisition and the relocation of some structures.

During construction, potential adverse effects comprise traffic disruption and delays, noise, dust, vibration, waste generation, and occupational and public safety risks. Mitigation measures include phased traffic management, night-time works for high-disruption activities, dust suppression, noise control, and public awareness campaigns. Temporary diversion roads will maintain connectivity, and construction will be sequenced to minimise interference with BRT operations.

In the operational phase, the project is expected to deliver significant benefits, including smoother traffic flow, reduced congestion-related emissions, and improved pedestrian safety. However, higher vehicle speeds may increase accident risks; these will be mitigated through guardrails, signage, roadway lighting, and speed management measures.

An Environmental Management Plan (EMP) has been developed to define responsibilities, monitoring indicators, and reporting arrangements. TANROADS will oversee compliance; contractors will implement site-level environmental and safety measures; and NEMC will monitor performance against regulatory requirements. Monitoring will focus on air quality, noise levels, traffic conditions, and community feedback, while waste management will emphasize reuse, recycling, and licensed disposal of hazardous materials.

Stakeholder consultations with residents, business owners, local leaders, and government agencies identified key concerns over land acquisition, business disruption, traffic safety, and BRT integration. These inputs informed design refinements, such as reducing the project footprint and adjusting road alignment to minimize displacement.

11. Land Acquisition and Resettlement

The land acquisition and resettlement process for the Project was developed in accordance with Tanzanian legislation, including the Land Act (1999), Land Acquisition Act (1967), Valuation and Valuers

Registration Act (2016) and related regulations, together with JICA's Guidelines for Environmental and Social Considerations (2022) and the World Bank's Environmental and Social Standard 5 (ESS5). The approach is designed to ensure that all Project Affected Persons (PAPs), regardless of tenure status, receive fair compensation and appropriate livelihood restoration support.

The project will require permanent acquisition of land for the flyovers, approach roads, frontage roads, and related facilities, as well as temporary occupation for construction yards and access routes. Both intersections are in densely developed urban areas, with land currently occupied by roadside shops, informal market stalls, residential units, and public utilities. While large-scale residential displacement is not expected, some commercial operators will lose part or all of their premises, necessitating targeted assistance to restore incomes. The total private land acquisition area for both intersections is 4,302 m², comprising 1,749 m² at the Mwenge Intersection and 2,553 m² at the Morocco Intersection. Another 3,163m² of public land used for commercial area and substation is needed for the Project. A total of 30 buildings and 67 tenants are estimated to require relocation.

Baseline surveys included cadastral mapping, a full inventory of physical assets, and socioeconomic profiling of PAPs. This census identified landowners, tenants, and informal occupants with use rights recognized under Tanzanian law. Data collected covered household size, income sources, and vulnerability factors such as female-headed households, elderly residents, and persons with disabilities.

Valuation of affected assets follows procedures set by the Chief Government Valuer, applying market value for land and full replacement cost for structures, crops, and improvements. Replacement cost calculations ensure that compensation is sufficient to restore the lost asset without depreciation deductions. In addition to cash payments for land and buildings, PAPs will receive allowances for disturbance, transport, and lost wage to cover the transitional needs. Businesses will also be compensated for loss of profit based on verified earnings. Vulnerable households will receive additional support such as expedited payments, relocation assistance, and referrals to social welfare programmes.

Public consultations were held with community members, business owners, local leaders, municipal authorities, TANROADS, BRT project representatives, and utility agencies. Stakeholders expressed concerns about timely and fair compensation, the avoidance of disruption during peak trading times, and the need for sufficient notice before displacement. These discussions informed design adjustments, including the realignment of Coca-Cola Road to reduce impacts on commercial frontages and the minimization of encroachment into the Wamachinga market area.

The Abbreviated Resettlement Action Plan (ARAP) specifies institutional responsibilities: TANROADS will coordinate implementation and funding; Kinondoni Municipal Council will handle local facilitation and grievance management; and registered valuers in TANROADS will perform verification and valuation. A three-tier grievance redress mechanism – community, municipal, and TANROADS headquarters – will be established to address disputes on eligibility, valuation, or payment in a timely manner.

No displacement will occur until compensation and assistance are fully delivered to eligible PAPs. Payments will be made directly to bank accounts to promote transparency, with financial literacy support provided where needed. Relocation will be monitored, and follow-up surveys conducted to verify that living standards and livelihoods are restored. The ARAP budget covers compensation for land, structures, and businesses, as well as administrative costs, livelihood restoration measures, and contingencies. Funding will be secured in advance, with disbursement synchronized with the construction schedule to prevent delays.

12. Gender-Related Survey and Planning

The gender-related survey and planning for the Project were undertaken to ensure that project design and implementation align with JICA's Guidelines for Environmental and Social Considerations (2022) and Tanzania's commitments to gender equality. The assessment examined existing gender disparities in transport access, mobility patterns, and employment opportunities, with a particular focus on how these intersections serve women, men, and vulnerable groups, including those engaged in informal roadside businesses.

Baseline findings revealed that women are highly dependent on public transport, walking, and roadside vending, often carrying goods or accompanying children. This makes safe pedestrian crossings, effective lighting, and protection from traffic hazards particularly important for their daily activities. Women's participation in the transport and construction sectors remains limited, both in skilled and unskilled roles, due to entrenched gender norms, inadequate recruitment outreach, and insufficient workplace facilities.

To address these challenges, the project integrates gender-responsive design measures such as safe, well-lit pedestrian pathways, accessible crossings near BRT stations, and guardrails to protect vendors and pedestrians from vehicular traffic. During construction, measures include promoting equitable hiring by contractors, providing separate sanitation facilities, ensuring equal pay for equal work, and delivering gender awareness training to site supervisors and project staff.

Stakeholder consultations specifically engaged women traders, commuters, and community leaders, whose feedback directly influenced the safety design to maintain public transportation access and minimize accident risks. Monitoring indicators under the Environmental and Social Management Framework will track gender-disaggregated data on employment, safety perceptions, and access improvements ensuring that gender equality goals are embedded throughout project implementation.

13. Project Implementation Plan

The Project Implementation Plan outlines a structured framework for delivering the Project, ensuring effective coordination among all stakeholders while maintaining traffic flow and minimizing public inconvenience. The plan defines a 42-month construction schedule for Mwenge and 35 months for Morocco, with the critical path focused on early utility relocation, substructure construction, and superstructure erection. Implementation will follow a phased approach, beginning with preparatory works such as site establishment, traffic management setup, and relocation of utilities, carried out in close coordination with local authorities, and the BRT operator (DART).

Procurement will be conducted through International Competitive Bidding (ICB) procedures, in line with JICA's procurement guidelines, to ensure transparency, competitiveness, and strict compliance with technical specifications. The tendering process will cover all major civil works, including bridge substructures and superstructures, approach roads, and roadside facilities, with bid documents prepared based on detailed design outputs and refined cost estimates. Construction supervision will be undertaken by a consultant team responsible for quality assurance, safety management, and schedule control, while TANROADS will serve as the implementing agency, coordinating closely with the National Environment Management Council (NEMC) to ensure environmental compliance.

Traffic management is central to the plan, utilising temporary diversions, night-time construction, and staged execution to minimise disruption in this high-traffic urban corridor. The plan also incorporates environmental and social safeguards, including the Environmental Management Plan (EMP), resettlement measures, and gender-responsive initiatives during implementation. Progress monitoring will be conducted

through regular site meetings, milestone inspections, and monthly reporting, ensuring early detection of potential issues and enabling timely mitigation measures to keep the project on schedule.

14. Responsibilities of the Implementing Agency

The implementing agency for this project is TANROADS, which will assume full responsibility for project execution, encompassing overall management, coordination, and oversight of all construction and related activities. TANROADS will ensure compliance with JICA's requirements, Tanzanian legislation, and applicable international standards, while managing procurement processes including tender preparation, bidding, and contract administration. Furthermore, TANROADS will supervise contractors and consultants to ensure strict adherence to quality, schedule, and cost parameters.

Key duties also include securing all necessary permits and clearances – such as the Environmental Clearance Certificate from NEMC – and maintain close coordination with local government authorities, utility providers, and the DART to mitigate conflicts with existing and planned infrastructure. TANROADS will be responsible for implementing all environmental and social mitigation measures outlined in the Environmental and Social Impact Assessment (ESIA) and the Abbreviated Resettlement Action Plan (ARAP), as well as ensuring stakeholder engagement throughout the project lifecycle.

A critical component of TANROADS' role is the coordination and execution of utility relocation works. This will include identifying and relocating underground water and sewer pipelines, electrical cables, telecommunications infrastructure, an electric power substation, and overhead power lines located within the construction areas of Mwenge and Morocco Intersections. TANROADS will liaise closely with utility service providers and relevant municipal agencies to plan and schedule these works in a way that minimizes service disruption and avoids delays to the main construction programme. Detailed relocation plans will be prepared in advance, and all necessary agreements with service providers will be secured to ensure completion of the relocation works before the commencement of the main construction works.

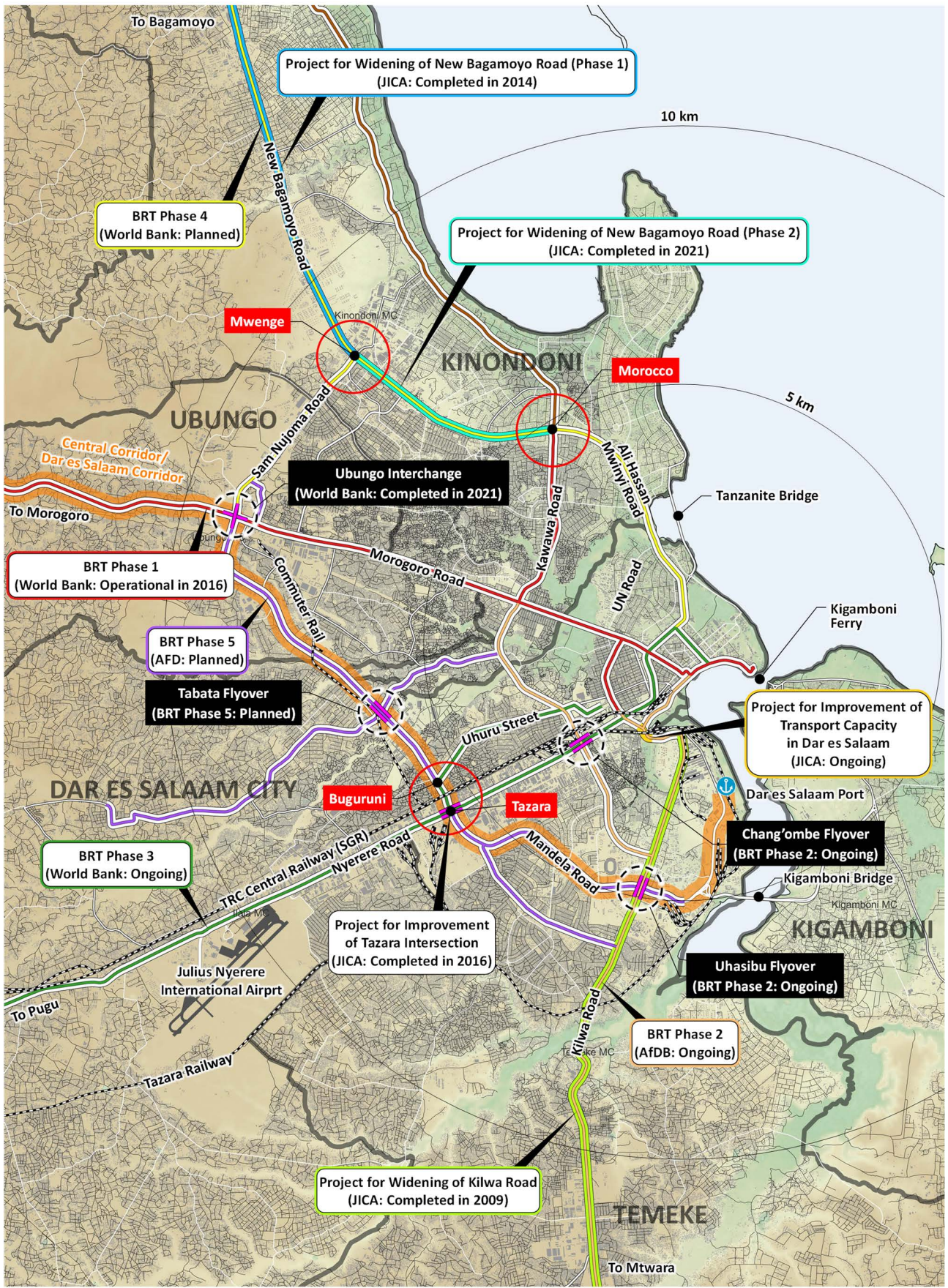
15. Conclusions and Recommendations

The project focuses on the improvement of the Mwenge and Morocco Intersections; however, sustained investment in grade-separated intersections across Dar es Salaam is recommended. Notably, the Buguruni-TAZARA Intersection, although outside the current project scope, remains a high-priority candidate for future development.

At Mwenge, it is strongly recommended that temporary shops within the ROW be relocated to achieve an optimal intersection layout. The proposed Y-shaped steel flyover, given its structural complexity, will require comprehensive global and finite element analyses, precise detailing of all connections, and a robust erection and maintenance plan, particularly considering Tanzania's limited experience with steel bridge construction.

For Morocco, the timely relocation of TANESCO's substation, as well as associated overhead and underground utilities, is critical prior to the commencement of construction activities.

At both sites, the detailed design phase should include a reassessment of drainage capacity, a thorough survey of underground utilities, and the preparation of detailed relocation designs. Given the high-traffic context, robust safety measures must be implemented for vehicles, pedestrians, and BRT. This should be supported by close coordination with relevant authorities and the police to manage temporary traffic restrictions effectively throughout the construction period.



Project Location Map



Mwenge Intersection



Morocco Intersection

**Preparatory Survey for Dar es Salaam Intersection Improvement Project
in the United Republic of Tanzania
FINAL REPORT**

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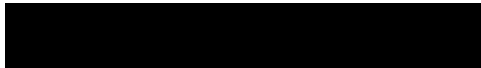
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List of Abbreviations

A	AASHTO	American Association of State Highway and Transportation Officials	
	AfDB	Africa Development Bank	
	AFD	Agence française de développement	
	AIDS	Acquired Immunodeficiency Syndrome	
	ARAP	Abbreviated Resettlement Action Plan	
B	B/C	Cost Benefit Ratio	
	BIM	Building Information Modeling/Management	
	BOD	Biological Oxygen Demand	
	BOQ	Bill Of Quantities	
	BRT	Bus Rapid Transit	
	BS	British Standards	
	C	CAPEX	Capital Expenditure
CBD		Central Business District	
CCM		Chama Cha Mapinduzi (Party of the Revolution)	
CCTV		Closed-circuit Television	
CDO		Community Development Officer	
CEDAW		Convention on the Elimination of All Forms of Discrimination Against Women	
CIM		Construction Information Modeling/Management	
CMM		Community meetings	
COD		Chemical Oxygen Demand	
CPI		Consumer Price Index	
D		DART	Dar es Salaam Rapid Transit
		DAWASA	Dar es Salaam Water and Sewerage Authority
		DCC	Dar es Salaam City Council
	DMDP	Dar es Salaam Metropolitan Development Project	
	DRC	Democratic Republic of the Congo	
	DSM	Dar es Salaam	
	DSMGP	Dar es Salaam Marine Gateway Project	
	DSM-RAS	Dar es Salaam Regional Administrative Secretary	
	DUTA	Dar es Salaam Urban Transport Authority	
	E	EAC	East African Community
EHS		Environmental, Health and Safety	
EIA		Environmental Impact Assessment	
EIRR		Economic Internal Rate of Return	
EIS		Environmental Impact Statement	
EMP		Environmental Management Plan	
EMoP		Environmental Monitoring Plan	
EMU		Electric Multiple Unit	
EPZA		Export Processing Zone Authority	
ESAL		Equivalent Single Axle Load	
ESF		Environmental and Social Frameworks	
ESIA		Environmental and Social Impact Assessment	
ESMP		Environmental and Social Management Plan	
ESS		Environmental and Social Standards	
EU		European Union	
F	FGM	Female Genital Mutilation	
	FIRR	Financial Internal Rate of Return	
	FYDP I	First Five-Year Development Plan	
	FYDP II	Second Five-Year Development Plan	
	FYDP II	Third Five-Year Development Plan	
G	GBV	Gender-Based Violence	
	GDI	Gender Development Index	
	GDP	Gross Domestic Product	
	GRDP	Gross Regional Domestic Product	
	GHG	Greenhouse Gas	
	GIS	Geographic Information System	

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	GoJ	Government of Japan
	GoT	Government of Tanzania
	GRC	Grievance Redress Committee
H	HCM	Highway Capacity Manual
	HIV	Human Immunodeficiency Virus
	HSMP	Health and Safety Management Plan
	HSSE	Health, Safety, Security and Environment
I	ICD	Inland Container Depot
	IEE	Initial Environmental Examination
	IFC	International Finance Corporation
	ISO	International Organization for Standardization
	ITS	Intelligent Transport System
J	JICA	Japan International Cooperation Agency
	JNIA	Julius Nyerere International Airport
	JPY	Japanese Yen
	JSSS	JICA Standard Safety Specification
K	KMC	Kinondoni Municipal Council
L	LDC	Least Developed Country
	LGA	Local Government Authority
	LTPP	Long-Term Perspective Plan
M	M/P	Master Plan
	MC	Municipal Council
	MD	Municipal Director
	MDGs	Millennium Development Goals
	MOFP	Ministry of Finance and Planning
	MOHA	Ministry of Home Affairs
	MOLHSD	Ministry of Land, Housing and Human Settlements Development
	MOW	Ministry of Works
	MOWT	Ministry of Works and Transport
	MRT	Mass Rapid Transit
N	NBS	National Bureau of Statistics
	NEAP	National Environmental Action Plan
	NEMC	National Environment Management Council
	NGO	Non-Governmental Organisation
	NHC	National Housing Corporation
	NIT	National Institute of Transport
	NMT	Non-Motorized Transport
	NSGRP	National Strategy for Growth and Reduction of Poverty
	NSSF	National Social Security Fund
	NPA-VAWC	National Plan of Action to End Violence Against Women and Children
	NPV	Net Present Value
O	O&M	Operation and Maintenance
	OD	Origin - Destination
	ODA	Official Development Assistance
	OECD	Organisation for Economic Co-operation and Development
	OPEX	Operating Expense
	OSHA	Occupational Safety and Health Authority
P	PAH	Project Affected Household
	PAP	Project Affected Person
	PCU	Passenger Car Unit
	PM10	Particulate Matter with diameters that are generally 10 micrometres
	PM2.5	Particulate Matter with diameters that are generally 2.5 micrometres and small
	PIT	Project Implementation Team
	PO-RALG	President Office, Regional Administration and Local Government
	PPE	Personal Protective Equipment
	PPP	Public-Private Partnership
	PPV	Peak Particle Velocity
	PS	Permanent Secretary
R	RAP	Resettlement Action Plan
	RAHCO	Reli Assets Holding Company

	RFB	Road Fund Board
	ROW	Right of Way
	RRB	Regional Road Board
S	SADC	Southern African Development Community
	SADCC	Southern African Development Coordination Conference
	SATTF	Southern Africa Trade and Transport Facilitation Project
	SEA	Strategic Environmental Assessment
	SEZ	Special Economic Zone
	SGR	Standard Gauge Railway
	SHM	Stakeholder Meeting
	SIGI	Social Institutions and Gender Index
	SOSPA	Sexual Offences Special Provisions Act
	STRADA	System for Traffic Demand Analysis
	SUMATRA	Surface and Marine Transport Regulatory Authority
T	TAA	Tanzania Airport Authority
	TANESCO	Tanzania Electric Supply Company Limited
	TANLAB	Tanzania Roads Agency Laboratory
	TANROADS	Tanzania National Roads Agency
	TanTIP	Tanzania Transport Integrated Project
	TARURA	Tanzania Rural and Urban Road Authority
	TAT	Transporters Association of Tanzania
	TATOA	Tanzania Truck Owners Association
	TAZARA	Tanzania-Zambia Railway
	TBS	Tanzania Bureau of Standards
	TCAA	Tanzania Civil Aviation Authority
	TDV	Tanzania Development Vision
	TEMESA	Tanzania Electrical, Mechanical and Electronics Service Agency
	TEU	Twenty-foot Equivalent Unit
	TIB	Tanzania Investment Bank
	TICTS	Tanzania Internal Container Terminal Services Limited
	TIF	Tax Increment Financing
	TLV	Threshold Limit Value
	TMA	Tanzania Meteorological Agency
	TOD	Transit Oriented Development
	TOR	Terms of Reference
	TPA	Tanzania Port Authority
	TRA	Tanzania Revenue Authority
	TRC	Tanzania Railways Corporation
	TRL	Tanzania Rail Limited
	TSIP	Transport Sector Investment Programme
	TTC	Travel Time Cost
	TZS	Tanzanian Shilling
U	UDA	Usafiri Dar es Salaam
	UDA-RT	Usafiri salama Dar es Salaam Rapid Transit
	US	United States
	USD	United States Dollar
	UWT	Umoja wa Wanawake wa Tanzani (United Women's Association of Tanzania),
V	VAT	Value Added Tax
	VFM	Value for Money
	VGf	Viability Gap Funding
	VOC	Vehicle Operation Cost / Volatile Organic Compound
W	WB	World Bank
	WHO	World Health Organisation

1. Introduction

1.1 Project Background

Dar es Salaam, the main economic center of the United Republic of Tanzania, faces severe traffic congestion due to rapid population growth and increasing motorization. The issue has become a significant social concern for the city. To address congestion and improve public transport, the phased development of the Bus Rapid Transit (BRT) system is underway, supported by international organizations such as the World Bank (WB), the African Development Bank (AfDB), and Agence Française de Développement (AFD). However, the implementation of the BRT system alone is insufficient to meet the growing demand for transportation.

In 2018, the Japan International Cooperation Agency (JICA) conducted the “Project for Revision of Dar es Salaam Urban Transport Master Plan” in collaboration with the Government of Tanzania. This effort resulted in the formulation of the Master Plan for Urban Transport in Dar es Salaam 2018-2040 (hereinafter referred to as the “revised M/P”). The revised M/P proposed introducing an Intelligent Transport System (ITS), improving eleven (11) major intersections, developing public transport terminals, and establishing urban railways to mitigate chronic traffic congestion and optimise the existing road infrastructure.

In 2020, JICA conducted a follow-up survey —the “Data Collection Survey on Urban Transportation in Dar es Salaam” to assess progress on the prioritized projects and evaluate the need for additional support through a Japanese ODA loan or grant. The survey recommended constructing grade-separated interchanges along New Bagamoyo Road at Mwenge and Morocco intersections and a continuous grade separation along Nelson Mandela Road between Buguruni and Tazara intersections.

Based on these findings, the Government of Tanzania, through the Tanzania National Roads Agency (TANROADS), requested JICA’s support for the proposed grade separation project. In response, JICA initiated the “Preparatory Survey for Dar es Salaam Intersection Improvement Project” to assess feasibility and facilitate further planning.

1.2 Purpose of Survey

This preparatory survey carried out the necessary studies for the three major intersections (namely, Mwenge, Morocco, Buguruni, and TAZARA) and selected two priority intersections for project implementation under the Japanese ODA loan.

The expected outcome of the project is to smoothen traffic flow on major roads, improve access to the port for freight transportation, and stimulate economic activities not only in Tanzania but also in neighbouring countries along the Central and Dar es Salaam Corridors.

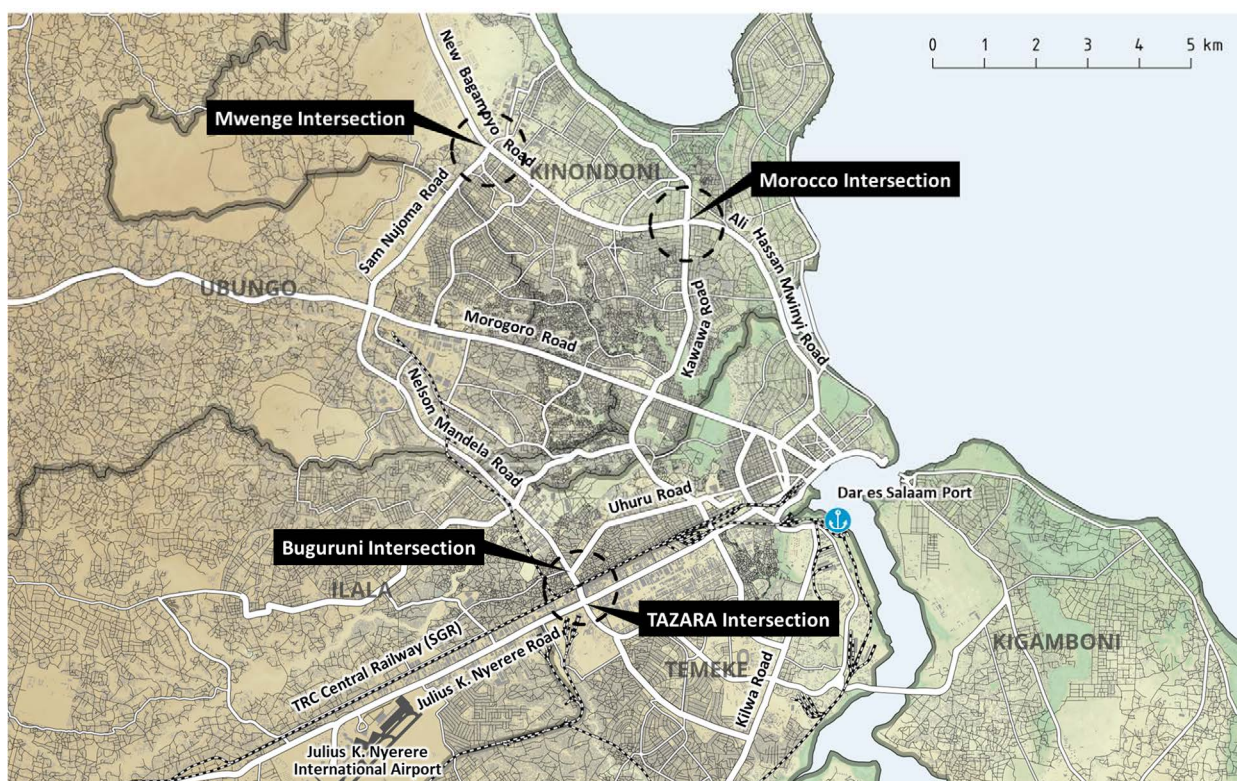
1.3 Preliminary Project Outline

Table 1.3.1 summarizes the outline of the Project.

Table 1.3.1 Outline of the Project

Project Name	Dar es Salaam Intersection Improvement Project
Project Objective	Construction of grade separations (flyovers or underpasses) at major intersections in Dar es Salaam to improve the traffic flow on the arterial roads, improve the logistical access to the port, and stimulate economic activity in Tanzania and neighbouring countries.
Project Outline	<ul style="list-style-type: none"> • Construction of grade separations at two intersections (Mwenge and Morocco) • Consulting service (detailed design, tender assistance, construction supervision, etc.)
Survey area	Dar es Salaam, Tanzania
Executing Agency	Tanzania National Roads Agency (TANROADS)
Project Scheme	Japanese ODA Loan

Source: JICA Survey Team



Source: JICA Survey Team

Figure 1.3.1 Project Location Map

1.4 Survey Outline

This survey commenced in May 2023 and was initially scheduled for completion by March 2024. However, following consultations with the Government of Tanzania, the survey period was extended and ultimately concluded in September 2025. The extension was attributed to the following factors:

- After the submission of the Progress Report in August 2023, TANROADS and the Ministry of Works (MoW) requested additional traffic demand forecasting to reflect a potential modal shift toward railway freight, in light of the anticipated commencement of Standard Gauge Railway (SGR) operations. They also requested further exploration of alternative grade separation designs for the Mwenge Intersection.
- Following the submission of the Draft Final Report in November 2024, TANROADS and the MoW requested revisions to the number of lanes for the right-turn flyover at the Mwenge Intersection, as well as adjustments to the number of lanes on the frontage roads at both the Mwenge and Morocco Intersections.

(1) Stage 1: Preparation

Stage 1 includes the following tasks:

- Task 1-1: Preparation, Explanation, and Discussion of the Inception Report

Upon commencing the work, the JICA Survey Team promptly shared, verified, and analyzed the relevant data and information collected. Extensive discussions were held to determine the scope of the site survey and to establish a schedule. A questionnaire was prepared, comprising a list of additional materials, information, and data required for collection. The Inception Report was finalized in May 2023 after obtaining confirmation from JICA.

(2) Stage 2: Data Collection and Planning

Stage 2 includes the following tasks:

- Task 2-1: Review of project background and necessities
- Task 2-2: Review of existing materials
- Task 2-3: Site investigation
- Task 2-4: Natural condition & baseline surveys
- Task 2-5: Data collection and coordination with BRT plans
- Task 2-6: Traffic demand forecast
- Task 2-7: Comparative study of grade separation alternatives
- Task 2-8: Selection of two locations/intersections
- Task 2-9: Preparation, explanation, and discussion of the Progress Report

Upon arrival in Dar es Salaam, discussions were held between the JICA Survey Team and TANROADS, in coordination with the JICA Tanzania Office, to present the Inception Report and exchange views regarding the project's implementation.

Subsequently, additional data related to Tasks 2-1 through 2-5 was collected through consultations with the relevant government agencies, and traffic surveys were conducted.

Based on the collected data, a traffic demand forecast (Task 2-6) and a comparative analysis of alternative grade separation options (Task 2-7) were carried out. The results were compiled into the Progress Report (Task 2-9).

To ensure the efficient implementation of subsequent tasks—particularly those related to environmental and social considerations, as well as land acquisition and resettlement planning—specific target intersections were to be selected at the Progress Report stage.

The initial version of the Progress Report was submitted in August 2023; however, a final decision on the two target intersections was not reached at that time. Following a revision of the traffic forecast to incorporate a modal shift to the Standard Gauge Railway (SGR), a revised Progress Report was submitted in April 2024. After further consultations with the Government of Tanzania, the Mwenge and Morocco intersections were officially selected as the focus of the project.

(3) Stage 3: Preliminary Design

Stage 3 includes the following tasks:

- Task 3-1: Preliminary design
- Task 3-2: Preparation of project implementation plan
- Task 3-3: Study of the necessity of advanced technology
- Task 3-4: Preliminary cost estimates

- Task 3-5: Preparation of procurement plan
- Task 3-6: Confirmation of project implementation structure
- Task 3-7: Confirmation of O&M structure
- Task 3-8: Confirmation of the executing agency's responsibilities
- Task 3-9: Consideration of COVID-19 Countermeasures
- Task 3-10: Study of environmental and social considerations
- Task 3-11: Preparation of the draft Land Acquisition and Resettlement Action Plan
- Task 3-12: Preparation, explanation, and discussion of Interim Report

Following confirmation of the project scope, a preliminary design (Task 3-1) was conducted to refine the technical and functional details of the proposed components. Detailed assessments and planning under Tasks 3-2 through 3-11 then followed.

To facilitate smooth and timely implementation, consultations were held with TANROADS and other relevant stakeholders throughout the process to reach stepwise consensus and mitigate potential delays.

The findings and outcomes of Stage 3 were consolidated into the Interim Report, which defined the draft project components. The Interim Report was submitted in August 2024.

(4) Stage 4: Project Formulation

Stage 4 includes the following tasks:

- Task 4-1: Preparation of Gender Action Plan
- Task 4-2: Confirmation of tax-exemption procedures
- Task 4-3: Project risk evaluation
- Task 4-4: Project evaluation
- Task 4-5: Considerations for climate change mitigation/adaptation
- Task 4-6: Preparation, explanation, and discussion of Draft Final Report

Tasks 3-10 (Study of environmental and social considerations) and 3-11 (Preparation of the draft Land Acquisition and Resettlement Action Plan) continued into Stage 4. In addition, Task 4-1, the preparation of the Gender Action Plan, was implemented during this stage. All necessary investigations related to natural and social environmental aspects were completed.

Furthermore, key information required for JICA's appraisal, including the results of Tasks 4-2 through 4-6—was consolidated. These findings were compiled in the Draft Final Report, which aimed to establish final consensus with TANROADS and other relevant agencies. A follow-up stakeholder meeting was also planned accordingly.

The Draft Final Report was initially submitted in November 2024. Following discussions with the Government of Tanzania, TANROADS and the MoW requested revisions to the number of lanes for the right-turn flyover at the Mwenge Intersection, as well as adjustments to the frontage road configurations at both the Mwenge and Morocco Intersections. Incorporating these design changes, revised reports were submitted in stages in April and May 2025.

(5) Stage 5: Final Stage (September 2025)

Stage 5 includes the following task:

- Task 5-1: Preparation of the Final Report

The findings and outcomes of the entire survey were consolidated and presented in the Final Report.

2. Current Transport System and Development Plans

2.1 Transportation System in Dar es Salaam

Dar es Salaam is currently undergoing rapid population growth and urbanisation, with an annual increase of approximately 5% over the past three decades. Moreover, the number of registered cars in the city has been rising at a faster rate than the population, increasing by 7% annually from 2001 to 2010, as reported by the National Bureau of Statistics. Consequently, the traffic congestion within the city has been worsening due to insufficient road network density and inadequate bus services, particularly in the suburbs.

During the rainy season, frequent flooding on urban roads leads to traffic disruptions and increases the risk of accidents. Additionally, the coexistence of cargo and passenger traffic on certain trunk roads impedes efficient traffic flow. These challenges are compounded further by poor transport management, which adversely impacts the overall efficiency and safety of the transport system.

Although the Government of Tanzania relocated central government functions to Dodoma City in 2016, Dar es Salaam continues to experience substantial population growth. However, the development of transport infrastructure has not kept pace with the increasing demand.

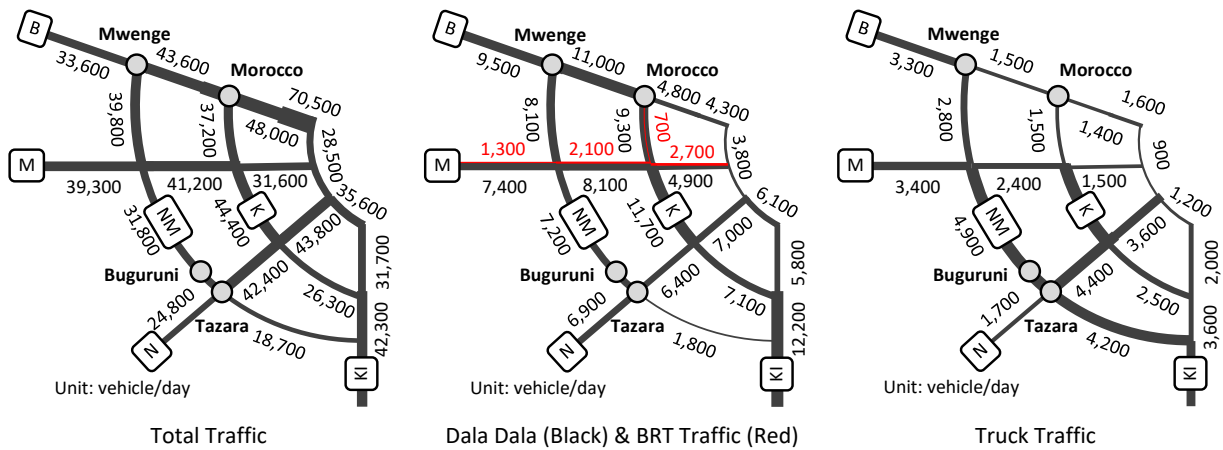
Dar es Salaam is located on a harbour along the Indian Ocean and serves as Tanzania's main port, handling exports of minerals and agricultural products. The main roads and railways originating from the port serve as key international corridors—namely, the Central Corridor and the Dar es Salaam Corridor—connecting Tanzania to Rwanda, Burundi, the Democratic Republic of the Congo (DRC), and Zambia. Consequently, urban traffic congestion in Dar es Salaam may undermine the competitiveness of these international corridors compared to others originating from Mombasa Port in Kenya and the port of Nacala in Mozambique.

(1) Current Road Transport

The road network in Dar es Salaam comprises four (4) primary radial roads—namely, New Bagamoyo Road/Ali Hassan Mwinyi Road, Morogoro Road, Nyerere Road, and Kilwa Road—and two (2) ring roads, Nelson Mandela Road/Sam Nujoma Road and Kawawa Road, located within a 5 to 10 kilometre radius of the Central Business District (CBD), which lies on a harbour on the Indian Ocean.

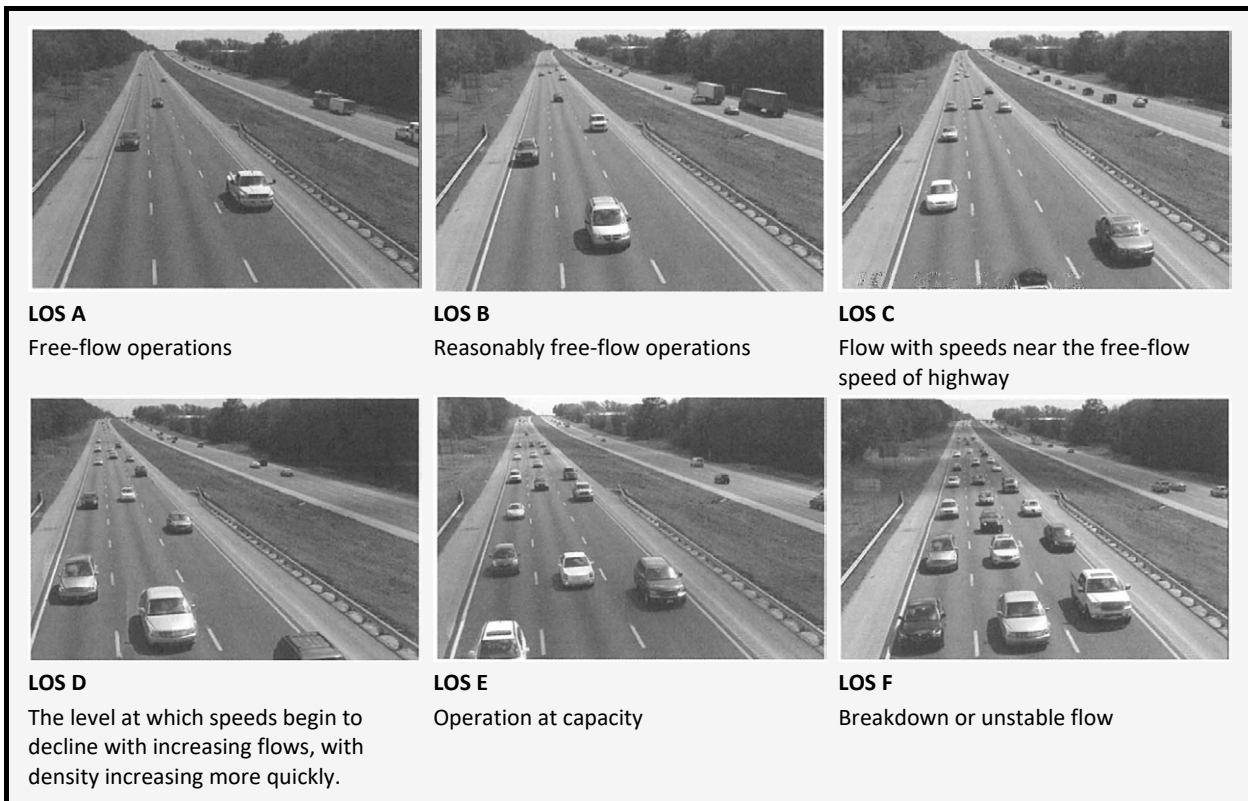
However, the traffic volumes on all these major roads have already exceeded their capacity (see Figure 2.1.1), as confirmed by the traffic survey conducted for the revised Master Plan (M/P).

According to the US Highway Capacity Manual, the volume-to-capacity (v/c) ratio for service level D (heavy traffic) is estimated to range from 1.24 to 2.09 for the four radial roads, and approximately 1.24 for the ring roads. During morning and evening peak hours, the average travel speed on the four radial roads leading from the CBD is significantly lower—approximately 10 km/h—compared to the standard traffic congestion threshold of 20 km/h.



B=New Bagamoyo Road, M=Morogoro Road, N=Nyerere Road, KI=Kilwa Road, NM=N. Mandela Road, K= Kawawa Road
 Source: Revised M/P

Figure 2.1.1 Current Traffic Volume on Major Arterial Roads in Dar es Salaam (2017)



Source: Transportation Research Board. 2010. Highway Capacity Manual 2010

Figure 2.1.2 Level of Service Examples

(2) Current Public Transport

Daladala (Passenger Minibus Service)

The primary mode of public transport in Dar es Salaam is the daladala—a passenger minibus service that carries between 15 and 45 passengers and operates across almost the entire city. However, daladalas are privately owned and operate independently, without adherence to a fixed schedule or coordinated system. As a result, travel times are often unpredictable due to inconsistent operational practices and prevailing traffic congestion, rendering the daladala an unreliable mode of transport.



daladala



Loading and Unloading of Passengers at the Bus Stop

Source: JICA Survey Team

Figure 2.1.3 daladala and Bus Stop

Bus Rapid Transit (BRT)

To enhance urban mobility and address the growing transportation needs of the city, the Dar Rapid Transit Agency (DART), with financial support from the World Bank (WB), the African Development Bank (AfDB), and Agence Française de Développement (AFD), introduced the Bus Rapid Transit (BRT) system. DART is responsible for the planning, implementation, and operation of the BRT network. The concept of introducing a BRT system in Dar es Salaam was first proposed in the late 1990s as a solution to traffic congestion and limited public transport options in the city.

Phase 1 of the BRT infrastructure, constructed along Morogoro Road, was completed in 2015, with bus operations commencing in May 2016. Since the launch of BRT Phase 1, the average travel speed along the corridor has increased to 30 km/h, even during peak hours. This improvement in mobility is attributed to the frequent and predictable service provided by the BRT. As of the latest available data from DART, the BRT serves approximately 200,000 passengers per day.



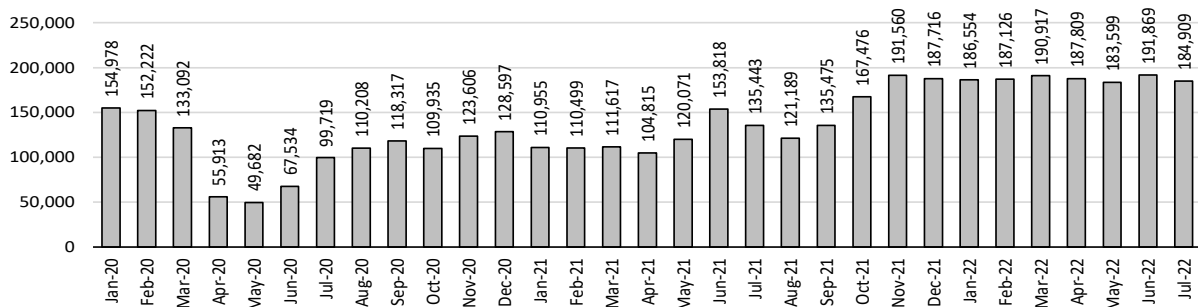
BRT Buses



Morocco BRT Terminal

Source: JICA Survey Team

Figure 2.1.4 BRT Bus and Station



Source: DART. 2022.11. 15th Joint Transport Sector Review

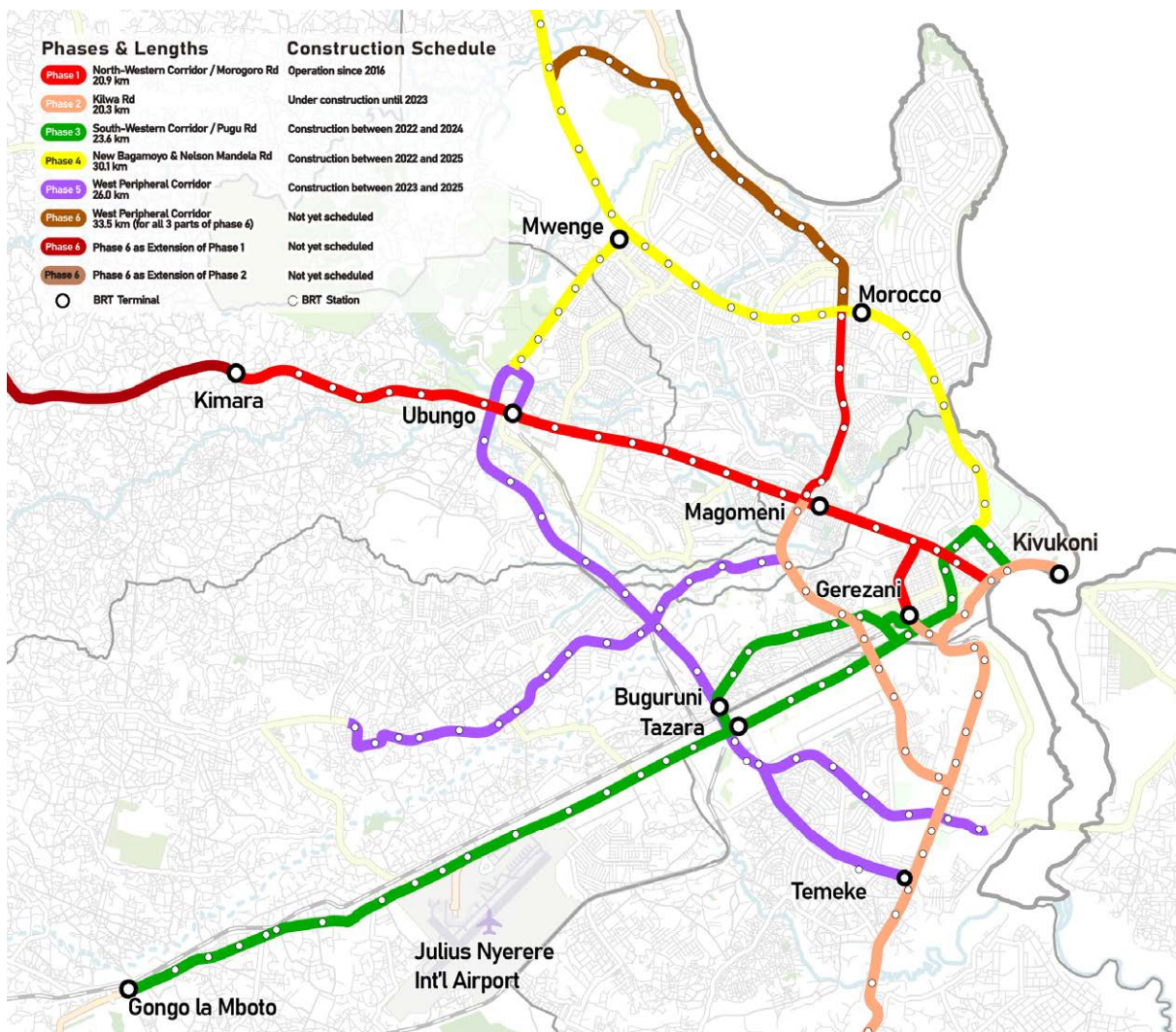
Figure 2.1.5 Average Daily Passengers on BRT System

Construction of the BRT Phase 2 infrastructure along Kilwa Road was completed in September 2023 and is expected to become operational in 2025. Implementation of construction works is also underway for BRT Phase 3 along Nyerere Road and BRT Phase 4 along New Bagamoyo Road. The construction of BRT Phase 5, which will run along Nelson Mandela Road, is expected to commence soon. DART aims to complete all five BRT phases, as shown in Figure 2.1.6, by 2027. Meanwhile, the Tanzania National Roads Agency (TANROADS) is responsible for the construction of the BRT infrastructure.

Table 2.1.1 Implementation Schedule of BRT Corridors

Phase	Road	Funding Source	Current Status
2	Kilwa Road, Kawawa Road	AfDB	Construction completed in 2023 (Yet to be operated)
3	Nyerere Road, Uhuru Street	WB	Construction ongoing (to be completed by 2025)
4	New Bagamoyo Road, Sam Nujoma Road	WB	Construction ongoing (to be completed by 2026)
5	Nelson Mandela Road,	AFD	Detailed design completed (to be constructed by 2027)
6	Old Bagamoyo Road	To be decided	

Source: JICA Survey Team



Source: JICA, 2023. Project for Transit Oriented Development (TOD) for Dar es Salaam

Figure 2.1.6 Planned BRT Corridors

Commuter Rail Services

Tanzania Railways Limited (TRL) launched commuter rail services between the CBD and Ubungu in 2016. Following the merger of TRL and the Rail Assets Holding Company (RAHCO) to form Tanzania Railways Corporation (TRC) in 2017, TRC has been operating commuter rail services from the CBD to Pugu and Ubungu. Currently, the commuter rail service operates three (3) trips during both the morning and evening peak hours, as indicated in Table 2.1.2.

Table 2.1.2 Commuter Train in Dar es Salaam

CBD – Pugu					CBD - Ubungo						
CBD	→	Pugu	Pugu	→	CBD	CBD	→	Ubungo	Ubungo	→	CBD
04:45	→	05:40	06:00	→	07:55	05:30	→	06:10	06:30	→	07:10
07:05	→	08:00	08:10	→	09:05	07:30	→	08:10	08:30	→	09:10
09:15	→	04:10	10:20	→	11:15	09:30	→	10:10	10:30	→	11:10
15:55	→	16:50	17:00	→	17:55	16:00	→	16:40	16:50	→	17:30
18:05	→	19:00	19:10	→	20:05	17:40	→	18:20	18:30	→	19:10
20:15	→	21:10	21:20	→	22:15	19:20	→	20:00	20:10	→	20:50

Source: TRC

Standard Gauge Railway (SGR)

TRC is currently constructing the Standard Gauge Railway (SGR) along the Central Corridor to facilitate intercity rail transport for both passengers and freight between Dar es Salaam and major inland centres, including Morogoro, Dodoma City and in future Kigali (Rwanda). Construction of the 1,219 km SGR network is being implemented in five phases:

- Phase 1: Dar es Salaam – Morogoro (300 km)
- Phase 2: Morogoro – Makutupora (422 km)
- Phase 3: Makutupora – Tabora (294 km)
- Phase 4: Tabora – Isaka (130 km)
- Phase 5: Isaka – Mwanza (249 km)

In parallel, TRC has started the procurement process for the construction of the Tabora - Kigoma (506 km) and Uvinza - Musongati - Gitega (367 km) sections. Discussions to secure financing are ongoing for the remaining sections: Kaliua - Mpanda- Karema (321 km) and Isaka - Rusumo - Kigali (495 km).

SGR commenced operations in July 2024. As of August 2025, four round-trip services operate daily between Dar es Salaam and Dodoma, and one service operates between Dar es Salaam and Morogoro—resulting in a total of ten daily services. The travel time between Dar es Salaam and Dodoma is approximately 3.5 hours.

Table 2.1.3 Timetable of SGR

Dar es Salaam	→	Morogoro	→	Dodoma	Dodoma	→	Morogoro	→	Dar es Salaam
06:00	→	07:40	→	09:42	05:15	→	07:17	→	08:53
08:00	→	09:25	→	11:15	14:10	→	09:50	→	11:40
09:30	→	11:15	→	13:25	-	-	16:20	→	18:10
16:00	→	17:45	-	-	17:15	→	19:25	→	21:10
18:55	→	20:51	→	23:01	18:40	→	20:30	→	21:55

Source: TRC



Source: TRC. 2023. Environmental and Social Impact Statement for SGR Lot 3 & 4

Figure 2.1.7 Planned SGR Network

2.2 Natural, Economic, and Social Conditions

(1) Natural Conditions

Dar es Salaam, located on the eastern coast of Tanzania, experiences a range of natural conditions influenced by its geographical location and climate (refer to Chapter 5 for more details):

- **Geography:** The city is situated on a narrow coastal strip along the Indian Ocean, featuring flat topography with some low-lying areas. It is bordered by the Indian Ocean to the east and by hills and plateaus to the north and west.
- **Climate:** Dar es Salaam has a tropical savanna climate, characterised by high temperatures and distinct wet and dry seasons. The city experiences two main seasons: a hot and humid wet season from November to May, and a relatively cooler, drier season from June to October. Average annual rainfall ranges from 900 to 1,200 mm.
- **Biodiversity:** Although urbanization has significantly impacted the natural environment, Dar es Salaam retains pockets of biodiversity. Coastal areas host mangrove forests, which provide important habitats for various species and serve as natural barriers against coastal erosion. The adjacent marine environment supports diverse aquatic life.
- **Beaches and Coastline:** Dar es Salaam is renowned for its beautiful coastline and sandy beaches. Areas such as Coco Beach and Mbudya Island attract locals and tourists for recreational activities such as swimming, sunbathing, and beachside dining.
- **Marine Environment:** The Indian Ocean off the coast of Dar es Salaam forms part of the wider Western Indian Ocean ecosystem. These waters are home to a variety of marine life, including coral reefs, fish, dolphins, and turtles. Conservation efforts are underway to protect and conserve these valuable resources.
- **Vegetation:** Natural vegetation in and around Dar es Salaam includes coastal and mangrove forests, grasslands, and shrublands. However, expansion of urban settlements and agriculture has resulted in degradation or clearance of much of the original vegetation cover.
- **Water Resources:** Despite its coastal location, Dar es Salaam faces challenges related to freshwater availability. The growing demand for clean water — for domestic, industrial, and agricultural use — places increasing pressure on existing sources. This necessitates effective management and conservation practices.

(2) Economic Conditions

Tanzania is classified as a lower-middle income country, with a GDP per capita of USD 1,149 in 2023¹. Its economy is relatively diversified: agriculture accounts for approximately one-quarter of value added, industry for one-third, and the remainder comes from the services sector. Agriculture remains the largest source of employment, with two-thirds of the population engaged in the sector. Meanwhile, rapid urbanization has resulted in 37% of the population residing in urban areas.

The poverty rate —based on the international poverty line of USD 2.15 per day at 2017 PPP (equivalent to approximately TZS 2,080 in 2024) —is estimated at 43%. Tanzania's Human Capital Index (HCI) stands at 0.39, broadly in line with the regional average for Africa.

Despite recent economic shocks, Tanzania has maintained macroeconomic stability, reflected in robust economic growth, manageable fiscal deficits, and single-digit inflation rates. Abundant natural resources and a favourable demographic profile have supported high investment levels and contributed substantially

¹ World Bank

to economic growth. In 2024, real GDP growth accelerated to 5.5%, driven by expanded exports, a strong agricultural season, and improved power supply. Global demand for Tanzanian products—particularly gold, tourism, and agricultural goods—enhanced the country’s terms of trade. Additionally, improvements in the business environment spurred investment in productive capacity, enabling firms to meet rising demand.

The current account deficit is projected to narrow to 2.3% of GDP in 2024—a sustainable level given steady inflows of foreign direct investment (FDI) and concessional external financing. These factors have helped to ease pressure on the foreign exchange market, despite limited exchange rate flexibility.

On the fiscal side, while Tanzania continues to pursue ambitious infrastructure investment plans, the fiscal deficit is gradually narrowing toward the regional benchmark of 3% of GDP. Although tax revenue remains low at 13% of GDP—below peer countries—public debt is contained at around 50% of GDP, a level considered fiscally sound. Together with tight monetary policy, prudent fiscal management has kept inflation below the central bank’s 5% target.

As the largest city and economic hub of Tanzania, Dar es Salaam plays a vital role in the country’s economy. Its economic conditions are influenced by both domestic and global factors. Government policies, the investment climate, infrastructure development, and regional trade dynamics collectively shape the city’s economic landscape. To sustain and enhance Dar es Salaam’s economic performance, continued investment in infrastructure, diversification of the economy, and human capital development remains essential.

Key economic sectors include:

- **Trade and Commerce:** Dar es Salaam serves as Tanzania’s main trading port and gateway to international markets. Its strategic location along the Indian Ocean facilitates trade with neighbouring countries and access to global shipping routes. The port handles a significant share of the country’s imports and exports, contributing to national economic growth.
- **Financial Services:** Dar es Salaam is home to Tanzania’s financial sector, hosting banks, insurance companies, and other financial institutions. The sector plays a critical role in facilitating investment, providing access to credit, and supporting businesses operations.
- **Industry:** Dar es Salaam’s industrial sector is diverse and includes food processing, textiles, cement production, pharmaceuticals, and chemical manufacturing.
- **Services Sector:** The services sector is a major contributor to the city’s economy. It comprises tourism, hospitality, telecommunications, transport, real estate, and professional services. The growing tourism industry attracts both domestic and international visitors, generating revenue and employment opportunities.
- **Informal Economy:** Like many African cities, Dar es Salaam has a significant informal sector, including small-scale businesses, street vendors, and informal employment. This sector provides livelihoods for a large portion of the population but faces challenges in regulation, access to finance, and social protection.
- **Infrastructure Development:** The city has experienced notable infrastructure development in recent years, including new roads, bridges, and public transport systems such as the BRT. These investments aim to enhance connectivity, reduce transport costs, and support urban economic activity.
- **Challenges:** Despite economic growth, Dar es Salaam faces various challenges such as income inequality, poverty, and unemployment. Addressing these challenges requires sustained efforts to promote inclusive economic growth, job creation, and social development.

(3) Social Conditions

Dar es Salaam, the largest city in Tanzania, has a diverse and dynamic social landscape.

- **Population and Demographics:** Dar es Salaam is a culturally vibrant city inhabited by a wide range of ethnic groups. While the majority of the residents belong to the Bantu-speaking communities, the city is also home to people from other regions of Tanzania —such as the Maasai and Luo —as well as immigrant communities, including individuals of Indian and Arab descent.

Rural-to-urban migration remains a major driver of the rapid population growth in Dar es Salaam. According to population and housing census data (see Table 2.2.1), the city’s population grew at an annual rate of 5.6% between 2002 and 2012, and at 2.1% between 2012 and 2022, reaching 5,383,728 in 2022. Of this population, approximately 60% of individuals aged 15 and above are employed.

Table 2.2.1 Population Growth of Dar es Salaam

	2002	2012	2022
Population in Dar es Salaam	2,487,288	4,364,541	5,383,728
Growth Rate		5.6%	2.1%

Source: National Bureau of Statistics. Population and Housing Census in 2002, 2012 and 2022

Table 2.2.2 Employment Status of Dar es Salaam Population (Aged 15 and Above)

	Employed	Unemployed	Inactive	Total
Kinondoni	463,272	83,736	139,275	686,283
Ilala	673,110	136,696	277,600	1,087,406
Temeke	560,309	139,963	202,978	903,250
Ubungo	482,571	94,193	167,115	743,879
Kigamboni	137,634	24,174	47,176	208,984
Total	2,316,896	478,762	834,144	3,629,802

Source: National Bureau of Statistics. Dar es Salaam Basic Demographic and Socio-Economic Profile. 2022

- **Education:** Compared to other regions in Tanzania, Dar es Salaam has relatively higher coverage of educational institutions and supporting infrastructure. The city hosts several universities, colleges, and schools, offering a broad range of educational opportunities. Basic education is provided from primary to advanced secondary school level (up to Form Six). However, access to higher education remains a challenge for low-income residents.
- **Healthcare:** Dar es Salaam has a more developed healthcare system relative to other parts of Tanzania, with a network of public and private hospitals, clinics, and healthcare centres. However, vulnerable populations —particularly those in informal settlements in peri-urban areas—continue to face challenges in accessing quality healthcare services.
- **Housing:** Housing conditions in Dar es Salaam are highly variable. The city comprises formal residential areas and apartment developments, alongside extensive informal settlements lacking adequate infrastructure and basic services. Access to affordable and secure housing remains a major concern for low-income households.
- **Social Services:** The city offers a range of social services, including social welfare programmes, social security mechanisms, and targeted support for vulnerable groups. Ongoing efforts aim to alleviate poverty, strengthen social safety nets, and enhance access to basic services such as water, sanitation, and electricity.

- Cultural Diversity: Dar es Salaam is known for its cultural diversity and vibrant arts scene. The city hosts various cultural festivals, music, dance, and traditional performances that reflect the rich heritage of Tanzania's many communities.
- Social Challenges: Dar es Salaam faces social challenges such as income inequality, poverty, and unemployment. Rapid urbanization and population growth continue to strain social infrastructure, resulting in disparities in access to public services and resources, especially for vulnerable populations.
- Community Engagement: Community-based organizations and civil society groups in Dar es Salaam are active in addressing social issues. These organizations play an important role in advocating for the rights of vulnerable populations and responding to community needs through grassroots initiatives.

Efforts are underway to improve social conditions in Dar es Salaam, with a focus on poverty reduction, improved access to education and healthcare, housing affordability, and social inclusion. Addressing these challenges requires coordinated action by government institutions, civil society organisations, and community participation to promote the well-being and resilience of all residents.

2.3 Development Plans

(1) Tanzania Development Vision 2025

Tanzania Development Vision 2025 outlines an ambitious plan to transition the country from a least developed to a middle-income economy by the year 2025, with a high level of human development. Central to this vision are five key attributes: (i) high quality livelihood, (ii) peace, stability, and unity, (iii) good governance, (iv) a well-educated and learning society, and (v) a competitive economy capable of producing sustainable growth and shared benefits.

The vision places strong emphasis on sustainable and inclusive development, aiming to eliminate racial and gender inequalities and empower all social groups. It underscores the critical role of peace, stability, and national unity in fostering development. Good governance and the rule of law are recognized as crucial for wealth creation, institutional accountability, and social trust. The Vision promotes a culture of accountability, rewarding good performance, and combating corruption.

Education and knowledge are prioritized as catalysts for development. The Vision seeks to cultivate a knowledge-based society that values hard work, professionalism, entrepreneurship, innovation, and gender equality. Knowledge is seen as a tool for mobilizing resources and addressing societal needs.

On the economic front, Tanzania aspires to shift from a low-productivity, agriculture-based economy to a semi-industrialized one. This transformation entails diversification, macroeconomic stability, infrastructure development, and enhanced competitiveness in both regional and global markets.

Key development targets for 2025, include food self-sufficiency, universal primary education, gender equality, access to quality healthcare and clean water, reduced infant and maternal mortality rates, increased life expectancy, and poverty eradication. In addition, the Vision promotes the preservation of moral and cultural values, the rule of law, and environmental sustainability.

Achieving the Vision requires leveraging Tanzania's strengths, such as national unity and social cohesion, while adapting to the evolving global landscape. The core enablers identified include a developmental mindset, competence and competitiveness, sound macroeconomic management, strong infrastructure development, and inclusive public participation.

The successful implementation of Vision 2025 depends on the synergy between good governance and economic competitiveness. It requires committed leadership, effective stakeholder engagement, and the political will to overcome implementation barriers. By aligning with these principles, Tanzania can realise its aspiration of becoming a developed and prosperous society by 2025.

(2) National Five-Year Development Plan 2021/22–2025/26

The Third National Development Plan represents the final phase of Tanzania's 15-year Long-Term Perspective Plan and serves as a key implementation instrument for the Tanzania Development Vision 2025. The first two five-year plans laid a strong foundation for socioeconomic transformation, enabling Tanzania to achieve middle-income status ahead of schedule. The third plan builds on this momentum by prioritizing inclusive and sustainable growth, good governance, education, and a competitive economy.

The First Five-Year Development Plan (2011/12 - 2015/16) focused on economic development through investment in core infrastructure. Notable achievements included railway rehabilitation, road construction, port upgrading, and expanded electricity generation. The overall implementation rate was approximately 60% of planned targets.

The Second Plan (2016/17 - 2020/21), guided by the slogan “Hapa Kazi Tu” (Here, Only Work), achieved an implementation rate of 93.8%. It successfully executed flagship projects such as the Central Corridor Standard Gauge Railway, the Julius Nyerere Hydropower Project, and the revamping of Tanzania Airline Corporation Limited. The plan also boosted the manufacturing sector’s contribution to GDP, and improved access to education and healthcare services.

The Third Plan (2021/22 - 2025/26) aims to advance objectives of Vision 2025. It structured across eight chapters that address: plan preparation, evaluation of the previous plan, private sector participation, building a competitive and industrial economy, strategic measures for competitiveness and human development, financial resources, implementation oversight, and monitoring and evaluation.

Tanzania enjoys strategic advantages due to its favorable geography and market access. The country ranks as the 31st largest globally by land area, shares borders with eight countries, and is a member of three regional trading blocs. These factors grant access to a combined market size of over 600 million people, with an aggregate GDP of approximately USD 1.0 trillion.

Despite this potential, the country faces major infrastructural deficiencies that limit its ability to maximize comparative advantages. Poor connectivity between production zones and consumption markets affects productivity, increases business costs, and undermines competitiveness. Tanzania’s road network spans 91,049 km, and includes national, regional, district, urban, and feeder roads.

To unlock its infrastructure potential and establish itself as a bridge economy and regional logistics hub, urgent investment is needed—particularly in transport, water supply, and electricity infrastructure. By implementing priority interventions across key sectors, Tanzania can attract investment in industries targeting new markets and realize its long-term aspiration of becoming a manufacturing and processing hub for the region.

Key interventions for unlocking transport infrastructure in the road sector include the following:

- Completion of 2,500 km of paved roads
- Construction of an additional 6,006 km of paved roads
- Decongestion of major cities
- Commencement of construction on 14 bridges
- Completion of construction on 7 bridges

To decongest Dar es Salaam, the following interventions are targeted for completion by 2025:

- Construction of eight flyovers at key intersections: Uhasibu, Chang’ombe, Kamata, Morocco, Mwenge, Magomeni, Tabata and Gerezani
- Implementation of BRT Infrastructure for Phases 1 through 6
- Construction of the New Selander Bridge
- Construction of Dar es Salaam – Chalinze Expressway
- Construction of the Dar es Salaam Outer Ring Roads (Bunju – Mbezi – Pugu corridor)

(3) National Transport Policy (NTP)

The National Transport Policy (NTP) was formulated in 2003 by then the Ministry of Communications and Transport (MOCT), now the Ministry of Transport (MOT). Its goal is to ensure efficient and cost-effective domestic and international transport services for all segments of the population and sectors of the economy, with maximum safety and minimal environmental degradation. The NTP provides a strategic framework for the development and management of Tanzania’s transport sector, with the following key components:

- **Long-Term Development Goal:** The country's long-term development goal is to enhance both productive and non-productive sectors of the economy, thereby improving living standards and quality of life. The NTP targets an increase in the per capita Gross Domestic Product (GDP) from approximately USD 210 to USD 2,500, in alignment with the Tanzania Development Vision 2025. The policy is informed by other national frameworks such as the National Poverty Reduction Strategy Paper (PRSP), Rural Development Strategy (RDS), civil service and parastatal sector reforms, private sector involvement, environmental sustainability, gender equity, diseases eradication, and literacy campaigns.
- **Various Economic Reforms:** Although recent economic reforms have improved overall performance, the NTP recognises that fundamental issues remain. These include the deterioration of social services, low agricultural growth (on which over 80% of the population depends), limited domestic savings, a vulnerable balance of payments position, and inadequate investment in physical infrastructure—particularly in the transport sector. The policy underscores the transport sector's pivotal role in enabling sustainable economic growth and development.
- **National Poverty Reduction Strategy:** The NTP aligns with the 1997 National Poverty Reduction Strategy, which guides poverty alleviation efforts. Low individual income levels and an uncondusive investment environment have hindered infrastructure development, including in transport. By improving transport systems and connectivity, the NTP aims to generate positive ripple effects across other sectors such as education, agriculture, health, and water supply. In rural areas—where poverty is most pronounced—the dominance of road transport and limited access underscores the need to strengthen feeder networks and enhance market linkages.
- **Realization of Objectives and Goals:** The achievement of sectoral goals in education, health, water, agriculture, manufacturing, tourism, mining, energy, land, and governance is recognised as contingent upon the availability of adequate and reliable transport systems. New investments in construction and rehabilitation will prioritize the movement of strategic agricultural exports, promote food security, support natural resource utilisation, and foster environmental sustainability. The NTP thus views enhanced transport infrastructure as an enabler of growth in other productive sectors.
- **The Central Role of Transport Infrastructure:** The central role of transport infrastructure in national development is recognised within the NTP. It is acknowledged that private sector investment in infrastructure development may be limited due to low traffic volumes. Therefore, the government will continue to play a leading role in infrastructure development. The NTP also aims to promote population integration and regional equity by providing transport systems that enable Tanzanians to exchange goods and services and to interact freely.
- **Transit Trade:** The NTP aims to enhance transit trade by improving infrastructure, including various transport modes, routes, and interface points such as transshipment hubs. It also addresses important issues such as security, environmental sustainability, and gender considerations.
- **Pursuit of Goals:** The NTP's goals will be pursued in conjunction with other national and sectoral policies, including those on agriculture, land, investment, industry, trade, energy, health, education, and tourism, which directly or indirectly affect the transport sector.
- **Social Sector Emphasis:** The NTP emphasizes the enhancement of transport infrastructure and services in inaccessible parts of the country to improve the delivery of social services, particularly during challenging conditions such as the wet season. It highlights the need for road maintenance; institutional arrangements for planning and coordination; financing; service delivery; appropriate legislation for private sector involvement; and public sector engagement in infrastructure enhancement through financial mobilization and capital investment.

The NTP identifies various urban transport challenges in Tanzania, emphasizing sustainability, efficiency, and environmental considerations, and provides policy directions in the following areas.

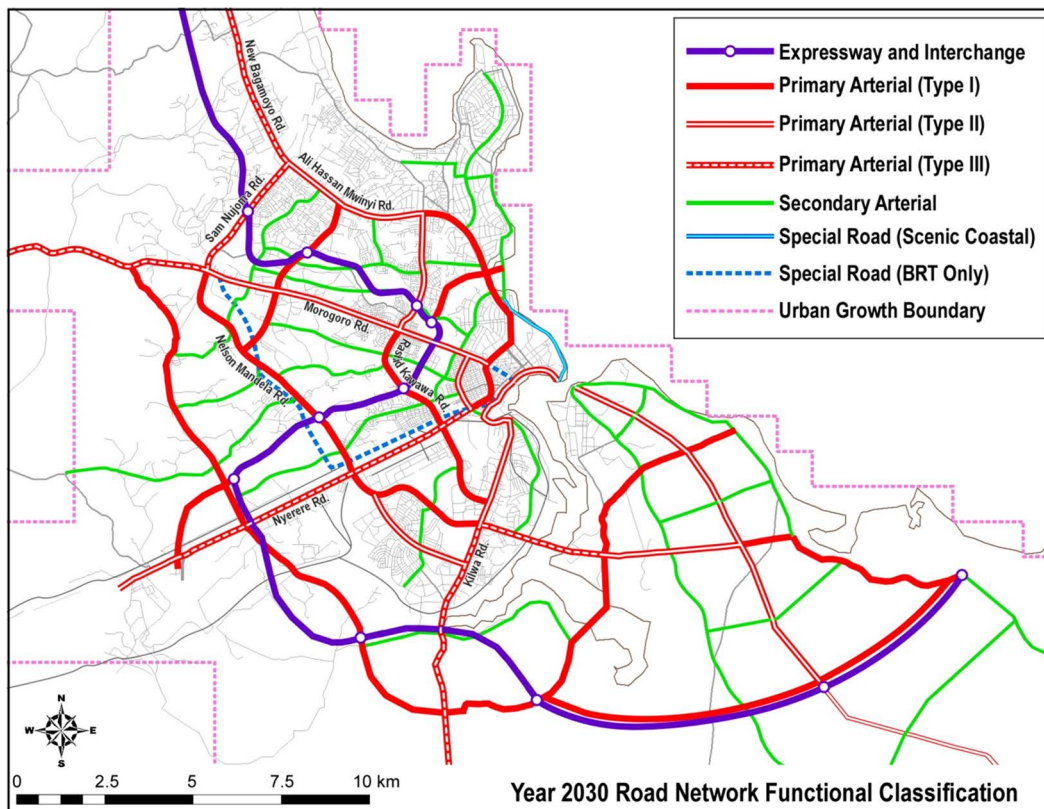
- **Road Infrastructure:** The policy aims to improve the capacity and quality of urban road infrastructure to accommodate increasing road traffic. Identified issues include insufficient road capacity, inadequate parking spaces, lack of maintenance and room for expansion, and inadequate facilities for non-motorized traffic and pedestrians.
- **Other Infrastructure:** The objective is to develop complementary transport infrastructure, such as rail and water transport, to ensure smooth traffic flow and reduce road congestion.
- **Road Services:** The policy aims to improve the provision of road transport services in urban areas. Key issues include the dominance of the private sector in service provision, the concentration of services along major arterial roads, and the limited penetration into newly developed suburban areas.
- **Traffic Flow and Management:** The objective is to minimize traffic congestion in major central business districts. Issues include the rapid increase in car ownership, lack of public education and awareness, inadequate traffic management, and widespread non-adherence to traffic rules and regulations.
- **Land Use Planning:** The objective is to address transport problems related to land use planning. Identified issues include poor implementation of master plans, lack of institutional coordination, and the concentration of social services and amenities in central business districts.
- **Transport for Disadvantaged Groups:** The objective is to facilitate the movement of disadvantaged populations in urban areas. The policy emphasizes the responsibility of the government, parents, and transport operators to address the mobility needs of special groups, such as students, persons with disabilities, and the elderly.
- **Public Vehicle Design Standards and Specifications:** The policy aims to ensure appropriate and acceptable vehicle design, standards, and specifications, including provisions that accommodate the needs of disadvantaged groups.
- **Institutional Arrangement for Urban Transport Management:** The policy aims to establish a comprehensive and effective institutional framework for urban transport management by addressing the fragmentation of responsibilities among various agencies.
- **Road Transport and Environment:** The objective is to provide environmentally friendly and sustainable road transport in urban areas. The policy focuses on minimizing pollution generated by traffic, enhancing road safety and traffic management, and strengthening local environmental institutions.
- **Rail Transport and Environment:** The policy aims to promote the use of environmentally sustainable rail transport in urban areas.
- **Urban Transport Planning and Financing:** The objective is to ensure adequate planning and financing of urban infrastructure. Policy directions include the institution of user charges, resource mobilization by urban authorities, and community involvement in the planning and financing process.
- **Air Transport and Environment:** The policy aims to promote the use of efficient and environmentally sustainable air transport in remote areas.
- **Maritime Transport and Environment:** The policy promotes the use of waterway transport as a more cost-effective and environmentally friendly alternative in areas with rivers, lakes, and coastal access.
- **Pipeline Transport and Environment:** The policy promotes the use of pipeline transport for the conveyance of fluids, considering it a fast and economical mode of access.

(4) Dar es Salaam Urban Transport Policy and System Development Master Plan (2008)

In 2008, the Dar es Salaam Urban Transport Policy and System Development Master Plan (the M/P 2008) was formulated through a JICA study, with the target year of 2030, to address traffic congestion and conduct feasibility studies for priority projects. The master plan aimed to improve urban transport in Dar es Salaam, address current and future challenges, promote sustainable development, and provide efficient and inclusive transport options for the city’s residents and visitors. The city aspired to become a Gamma World City, serving as a regional gateway. The plan included a projected population of 5.8 million by 2030 and emphasized the need to accommodate this growth while preventing uncontrolled urban sprawl through the implementation of an Urban Growth Boundary (UGB). Priority was given to the development of the strategic corridor along Morogoro Road and the establishment of satellite centers away from the city center.

The Urban Transport Development Policy covered short-term, medium-term and long-term interventions, including urgent projects, public administration reform, capacity development, and urban regeneration. It highlighted the establishment of the Dar es Salaam Urban Transport Authority (DUTA) and the expansion of the National Institute of Transport Studies (NCTS). Private sector participation and regular monitoring of the master plan were recommended. The core policies and strategies focused on financing, pedestrian and non-motorized transport infrastructure, public transport-oriented development, accessibility, and intensive development within the UGB.

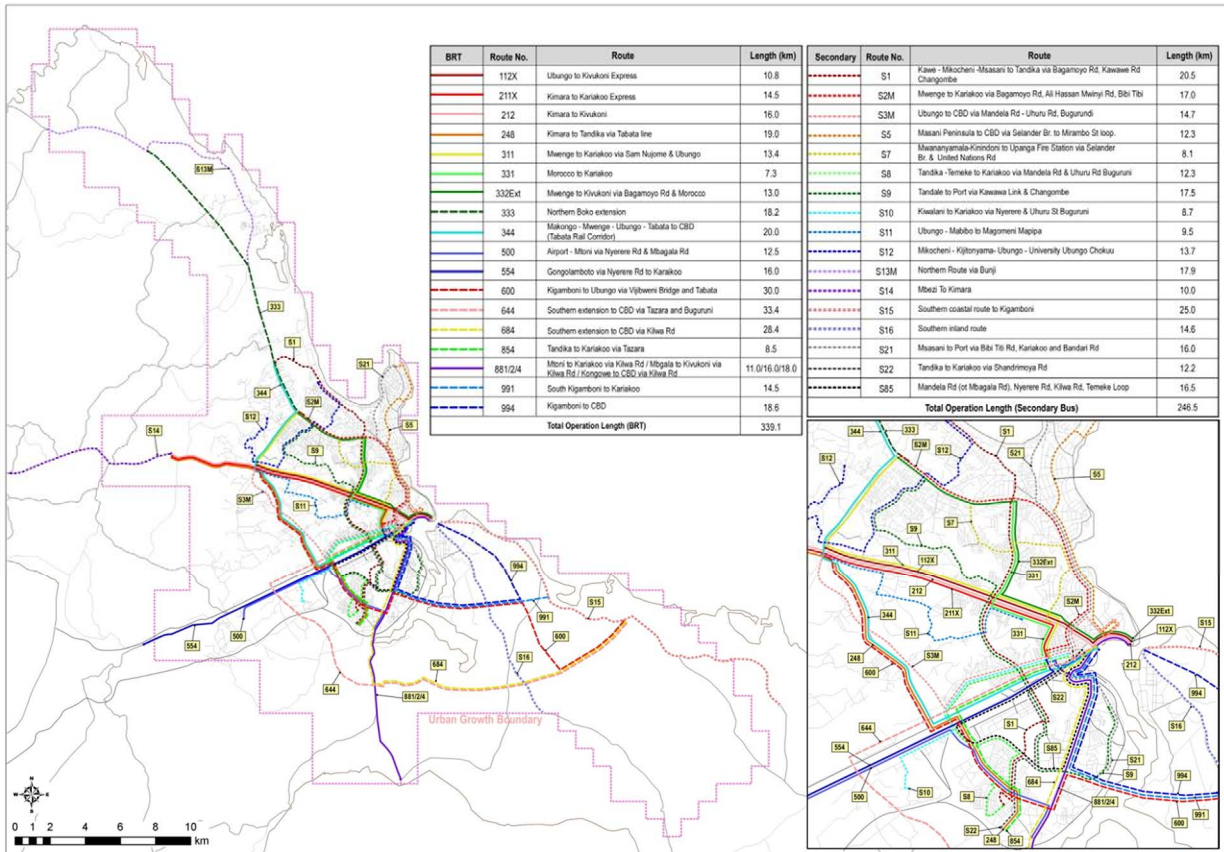
The Road Transport Sector Plan proposed a functional road classification scheme, including expressways, primary, secondary, and tertiary arterial roads; community/local roads; and special roads. It emphasized the integration of the Bus Rapid Transit (BRT) system into the road network and identified priority projects for road improvements, flyovers, and BRT corridors. The plan aimed to establish a clear road hierarchy, improve traffic flow, support urban development, and enhance traffic efficiency and safety.



Source: JICA. 2008. Dar es Salaam Urban Transport Policy and System Development Master Plan

Figure 2.3.1 Road Network Development Plan 2030

The Public Transport Sector Plan recommended the establishment of DUTA to oversee and coordinate the urban transport system. The plan included the design of a comprehensive bus route network comprising trunk lines, complementary buses, secondary buses, and feeder services. A clear separation of responsibilities among stakeholders was considered essential, with the DART Agency playing a central role in the development of an integrated mass transit system. Performance-based contracts and effective contract management were emphasized as critical factors for the system’s success.



Source: JICA. 2008. Dar es Salaam Urban Transport Policy and System Development Master Plan

Figure 2.3.2 Public Transport Development Plan 2030

The Central Business District Traffic Management Plan aimed to implement high-priority projects associated with the BRT Phase I project. The plan focused on maximizing accessibility, increasing capacity through low-cost solutions, and prioritizing public transport and pedestrian facilities. The recommended road network and parking plan included intersection improvements, connecting streets, the implementation of one-way systems, and the conversion of on-street parking. Long-term strategies comprised land use planning, enhanced public transport options, a circulator bus service, park-and-ride schemes, pedestrianized streets, cycleways, and a balanced parking plan.

Projects Implemented Based on the Master Plan Recommendations:

- New Bagamoyo Road Widening Japan’s Grant Aid
- Kigamboni Bridge and Access Road Improvement National Social Security Fund (NSSF)
- Gerezani Area Transport Enhancement Japan’s Grant Aid
- Selander Bridge Bypass Export–Import Bank of Korea
- TAZARA Intersection Improvement Project Japan’s Grant Aid
- Ubungo Intersection Improvement Project World Bank

(5) Revised Dar es Salaam Urban Transport Master Plan (2018)

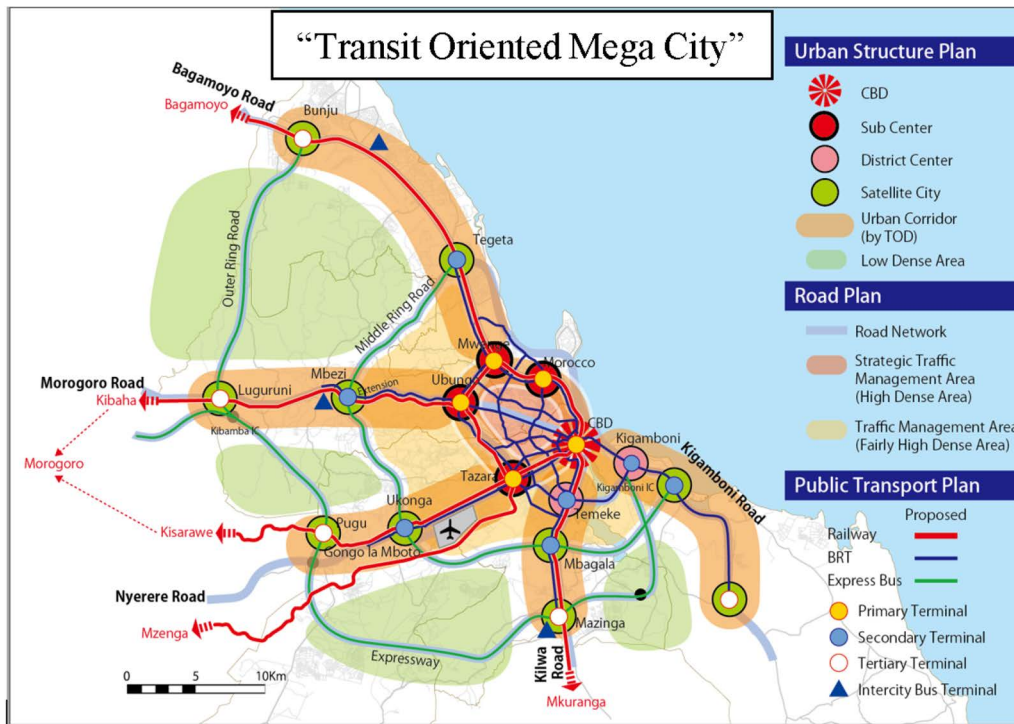
In 2018, the Revised Dar es Salaam Urban Transport Master Plan (the revised M/P) was developed as part of JICA's Project for Revision of the Dar es Salaam Urban Transport Master Plan. Its purpose was to update the M/P 2008. The revision was necessitated by significant population growth and increased traffic demand in Dar es Salaam, which had surpassed the projections made in the M/P 2008. Although some projects proposed in the M/P 2008 were initiated, many remained unimplemented, creating challenges for the city in addressing its growing population and transport needs.

To tackle these challenges, JICA's project aimed to formulate an updated plan aligned with current traffic demand and travel patterns. The new plan targeted the year 2040 and introduced various proposals for Tanzanian stakeholders, including the President's Office-Regional Administration and Local Government (PO-RALG) and the Dar es Salaam City Council (DCC).

Key components of the revised M/P include the following:

- **Future Population and Urban Structure:** As of 2017, the population in Dar es Salaam was 5.8 million and is projected to reach 12 million by 2040. The plan proposed an urban structure known as the "Palm and Fingers," comprising five radial urban corridors and one loop corridor. It also recommended the development of sub-centers and satellite cities connected to the CBD.
- **Transit-Oriented Mega City:** To respond to increasing traffic demand, the plan proposed integration and collaboration between the BRT and urban railway systems. By improving travel speed, punctuality, and mobility, the plan aimed to ensure that destinations across the city could be accessed within one hour. Transit-Oriented Development (TOD) was recommended along railway and BRT corridors, with a focus on sustainable and efficient public transportation.
- **Improvement of Road Infrastructure:** The plan emphasized the development of a "Radial and Circular Trunk Road Network" to enhance the function and capacity of the city's transport infrastructure. It proposed the construction of three new roads—Middle Ring Road, Outer Ring Road, and Bay Link Road to Kigamboni—as well as flyover projects at key intersections and the improvement of feeder roads to alleviate congestion and improve quality of life.
- **Traffic Management with Advanced Technology:** The plan advocated for the introduction of advanced traffic management systems by 2030, including a Dynamic Signal Control Optimization System, a Real-Time Traffic Information System, and a Public Transport Priority System. By leveraging such technologies, Dar es Salaam aspires to become a leading African mega city in traffic efficiency and smart mobility.
- **Capacity Development:** To ensure effective implementation, the Master Plan Team emphasized the need for clear institutional ownership and a well-defined allocation of responsibilities among stakeholders. It proposed the establishment of the Dar es Salaam Development Information Centre to facilitate the sharing and integration of relevant data, along with the early establishment of a coordinating body. Public-private partnerships (PPPs) were considered vital for promoting TOD, and technical cooperation was recommended to support capacity development for plan execution.

The revised master plan estimated the total project cost at approximately USD 10 billion over the 22-year implementation period (2018 – 2040). The economic evaluation indicated a feasible Economic Internal Rate of Return (EIRR) of 32.3%.



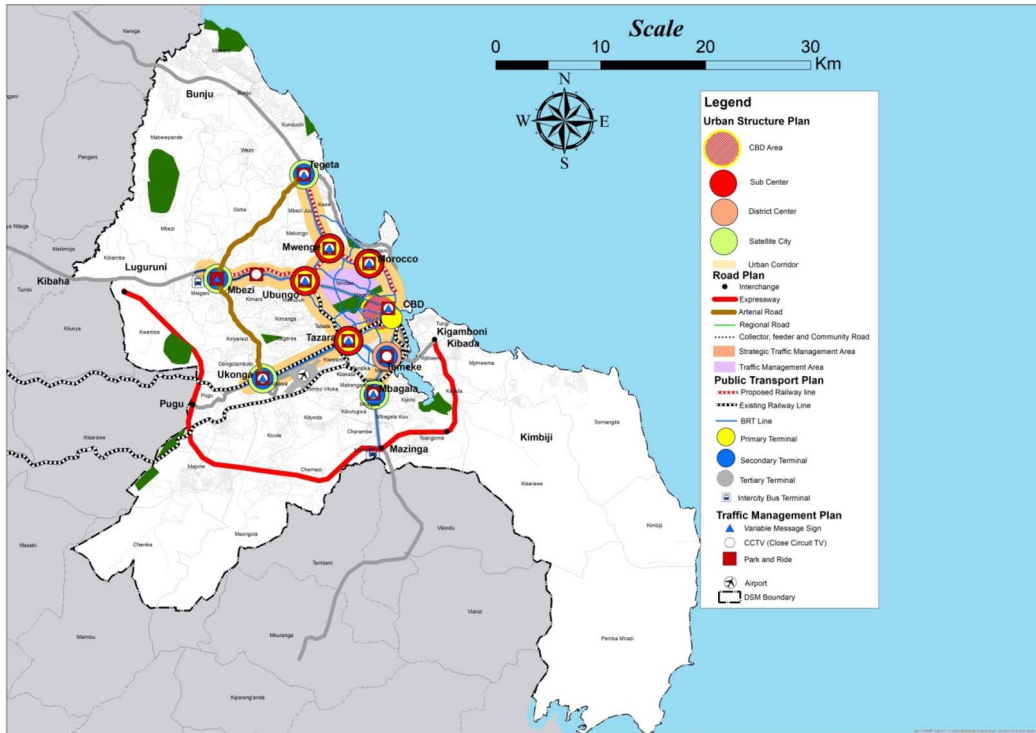
Source: JICA. 2018. Project for Revision of the Dar es Salaam Urban Transport Master Plan

Figure 2.3.3 Conceptual Map of Urban Transport Master Plan (Long-Term Vision)

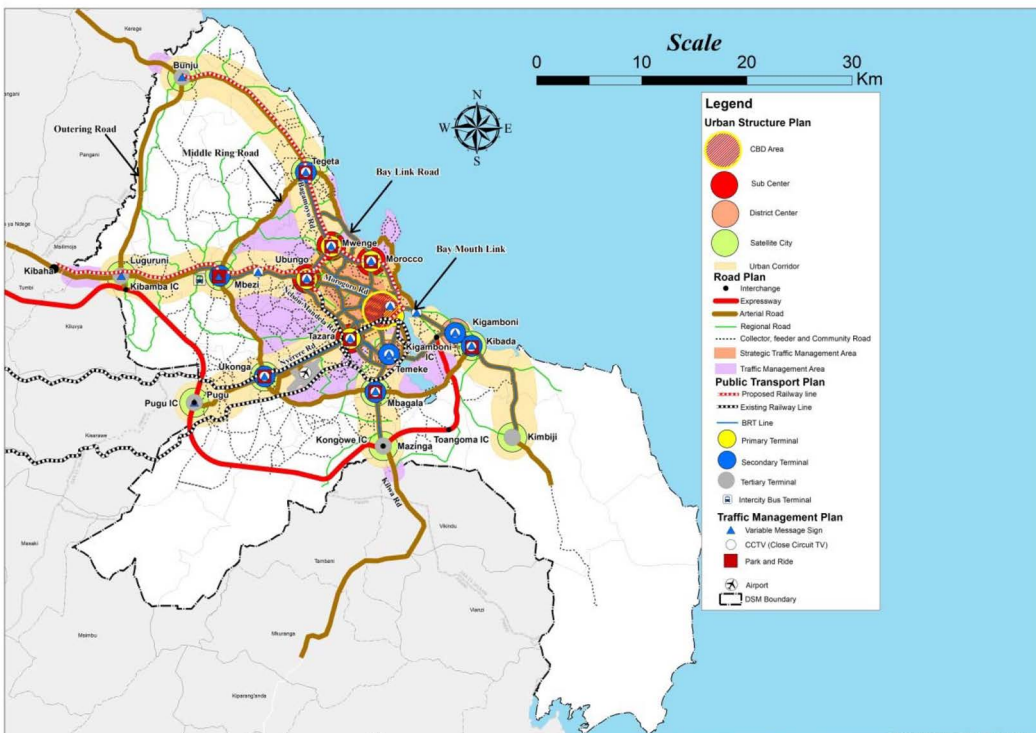
Based on these findings, the following recommendations were made to support the realization of a transit-oriented mega city, accommodate projected population growth, and enhance transportation efficiency and quality of life in Dar es Salaam.

- **Incorporating the Master Plan into Policies and Plans:** The concepts and strategies of the revised master plan should be integrated into national, regional, and city plans and policies, such as the Dar es Salaam Master Plan (2012-2032), the National Transport Policy, and the forthcoming National Five-Year Development Plan. This harmonization of plans and policies would ensure alignment and institutional support for the master plan's objectives.
- **Promoting Appropriate Land Use:** Effective investment in transport infrastructure and regulation of land development are essential for directing population growth toward destined urban corridors. It was recommended that land development regulations and standards be established, taking into account the projected increase in population and density. The completion of the ongoing Dar es Salaam Master Plan is expected to serve as a foundation for land use regulation.
- **Promoting TOD through Railway and BRT Collaboration:** Private sector participation in urban development along the proposed railway and BRT corridors was recommended. By improving the capacity and service standards of public transport, the plan aims to encourage modal shifts, reduce congestion and increase revenue for operating agencies. The development of a business model based on TOD—such as the sale of land around transit stations and the creation of commercial and residential zones—was also suggested. Technical cooperation would be beneficial in supporting TOD implementation and in establishing legal frameworks and mechanisms for effective public-private partnerships.
- **Developing a Radial-Circular Road Network for Logistics:** The construction of middle and outer ring roads was identified as crucial for improving traffic flow and ensuring road safety in the suburbs. The proposed network would help divert freight traffic from radial arterial routes and facilitate a modal shift towards railway transport. It was recommended that the development of these roads be prioritized to enhance cargo transport capacity and reduce urban congestion.

- Early Engagement for Prioritized Projects:** The Tegeta Railway Line and the Morogoro Railway Line were identified as high-priority projects due to their potential to reduce congestion and strengthen the public transport network. It was recommended to conduct feasibility studies for the Tegeta Railway Line and to provide technical assistance for capacity development, institutional arrangements for public-private partnerships, and the establishment of investment funding mechanisms.



Medium-Term until 2030



Long-Term until 2040

Source: JICA. 2018. Project for Revision of the Dar es Salaam Urban Transport Master Plan

Figure 2.3.4 Strategic Plan

2.4 International Logistics

(1) Road Transport in East Africa

The East African Community (EAC) is an intergovernmental organization comprising eight countries in East Africa: the Democratic Republic of the Congo, the United Republic of Tanzania, Kenya, Burundi, Rwanda, South Sudan, Somalia, and Uganda. The EAC has identified ten (10) main transport corridors totalling approximately 14,460 km which constitute the East African Regional Road Network. These roads are of strategic importance for facilitating regional and international trade, and must therefore be maintained in excellent condition. To ensure a high level of serviceability, the EAC has collaborated with partner states and established a collaboration platform with development partners to mobilize funds for the development and maintenance of these corridors.

The ten primary corridors are as follows:

- **Northern Corridor** (2,080 km): Mombasa - Nairobi - Nakuru - Eldoret - Bungoma - Malaba - Bugiri - Jinja - Kampala - Masaka - Katuna/Gatuna - Kigali - Nemba/Gasenyi - Ngozi - Kayanza - Bugarama - Bujumbura
- **Central Corridor** (2,170 km): Dar es Salaam - Morogoro - Dodoma - Singida - Nzega - Tinde - Isaka - Lusahunga to: (i) Gisenyi via Rusumo and Kigali, (ii) Bujumbura via Nyakasanza, Kobero and Gitega, and (iii) Masaka via Bukoba and Mutukula
- **Dar es Salaam (TAZARA) Corridor** (1,100 km): Morogoro - Iringa - Mbeya - Tunduma
- **Namanga Corridor** (1,800 km): Iringa - Dodoma - Babati - Arusha - Namanga - Nairobi - Thika - Murang'a - Embu - Nyeri - Nanyuki - Isiolo - Marsabit - Moyale
- **Sumbawanga Corridor** (1,260 km): Tunduma - Sumbawanga - Mpanda - Uvinza - Kasulu - Manyovu/Mugina - Makamba - Nyanza Lac - Rumonge - Bujumbura
- **Sirari Corridor** (1,500 km): Biharamulo - Mwanza - Musoma - Sirari/Isebania - Kisii - Kisumu - Kakamega - Webuye - Kitale - Lodwar Lokichokio
- **Coastal Corridor** (1,500 km): Mingoyo - Dar es Salaam - Bagamoyo - Tanga - Horohoro/Lungalunga - Kwale - Mombasa - Kilifi - Malindi - Lamu
- **Mtwara Corridor** (800 km): Mtwara - Mingoyo - Masasi - Tunduru - Songea - Mbamba Bay
- **Tanga Corridor** (1,650 km): Tanga - Arusha - Musoma - Lake Victoria - Kampala
- **Gulu Corridor** (600 km): Nimule - Bibia - Gulu - Lira - Soroti - Mbale - Tororo

Table 2.4.1 shows the cargo volume handled at the ports of Mombasa (Kenya) and Dar es Salaam (Tanzania), sorted by country. The data reveal a distinct geographical pattern: countries north of Lake Victoria (e.g. South Sudan and Uganda) mainly use the Northern Corridor via Mombasa, while those south of Lake Victoria (e.g. DRC, Rwanda, and Burundi) rely more heavily on the Central Corridor via Dar es Salaam.

Table 2.4.1 Cargo Volume Handled in the Northern and Central Corridors

Unit: 000 Ton

	Port of Mombasa (Northern Corridor)		Port of Dar es Salaam (Central Corridor)	
	2020	2021	2020	2021
South Sudan	1,056,026	1,065,699	0	0
Uganda	7,698,331	7,263,290	153,994	138,805
DRC	732,108	787,933	1,840,657	2,357,867
Rwanda	426,814	184,753	1,239,238	1,366,289
Burundi	725	1,027	476,808	507,018
Others	257,011	238,245	1,629,589	2,012,309
Total	10,171,015	9,540,947	5,340,286	6,382,288

Source: Northern and Central Corridors Transport Observatories. 2022. Joint Performance Report 2020-2021



Figure 2.4.1 East African Community Road Network

(2) Impact of Congestion on International Logistics

As indicated above, the road section from the port of Dar es Salaam to Morogoro serves as a critical gateway to the Central Corridor, the Dar es Salaam Corridor, and other subsidiary corridors. At present, Nelson Mandela Road and Morogoro Road are the primary arterial roads along these international corridors.

Congestion at intersections in Dar es Salaam has significant implications for logistics and connectivity, particularly in relation to the movement of goods from the port to inland Tanzania and neighbouring

landlocked countries such as Zambia, the Democratic Republic of the Congo (DRC), Rwanda, Burundi, and Uganda. The key issues associated with congestion are outlined below:

- **Delays in Cargo Movement:** Congestion at critical intersections results in substantial delays in the movement of cargo from the port to inland destinations. Trucks transporting goods often experience extended waiting times, leading to increased transit durations and reduced efficiency across the logistics chain.
- **Increased Transportation Costs:** Prolonged delays contribute to higher transportation costs. Transporters incur additional expenses related to fuel consumption, driver wages, and vehicle depreciation. These increased costs may reduce trade competitiveness and raise the price of imported goods for consumers.
- **Disruptions to Supply Chains:** Congestion disrupts supply chain operations, impeding the timely delivery of goods to businesses and consumers. Delays in the movement of essential commodities, raw materials, and intermediate goods can lead to production slowdowns, stockouts, and diminished competitiveness for affected industries.
- **Port Efficiency and Capacity Constraints:** Congestion at critical intersections reflects broader challenges in the overall efficiency and capacity of the Port of Dar es Salaam. The port may struggle to accommodate increasing cargo volumes, resulting in bottlenecks and limited throughput. Infrastructure limitations and operational inefficiencies contribute to congestion and hinder the smooth functioning of logistics systems.
- **Impact on Landlocked Countries:** The effects of congestion extend beyond Tanzania, impacting landlocked countries that depend heavily on the Port of Dar es Salaam for their international trade. Zambia, DRC, Rwanda, Burundi, and Uganda rely predominantly on the Central and Northern Corridors for the transportation of imports and exports. Delays and inefficiencies in the logistics chain reduce trade competitiveness and constrain economic development in these countries.

Effectively addressing congestion-related challenges requires a coordinated multi-faceted approach. The following key measures are recommended:

- **Infrastructure Development:** Investment in the expansion and improvement of the road network is essential, particularly at critical intersections such as Mwenge, Morocco, Buguruni, and TAZARA. Upgrading existing roads, constructing strategic bypasses, and implementing intelligent traffic management systems can significantly reduce bottlenecks and improve connectivity within Dar es Salaam and along regional corridors.
- **Port Efficiency Enhancements:** Enhancing the operational capacity and efficiency of the Port of Dar es Salaam is a critical priority. This includes infrastructure upgrades, the digitisation and streamlining of customs clearance procedures, and the optimization of port logistics to accelerate cargo handling and minimise turnaround times.
- **Multimodal Transport Integration:** The development and promotion of multimodal transport options—such as railways and inland waterways—offer sustainable alternatives to cargo movement. Improved intermodal connectivity and coordinated planning between transport modes can reduce reliance on overburdened road corridors, enhance freight efficiency, and build system resilience.
- **Regional Collaboration:** Strengthened collaboration among EAC member states is vital for addressing congestion along cross-border trade routes. Harmonizing trade and transit procedures, streamlining border clearance processes, and facilitating the exchange of best practices can improve regional connectivity and enhance the performance of international supply chains.

2.5 Institutional Framework and Financial Situation

(1) Roads Fund

The Roads Fund and its governing Board were established in 2000 under the Roads and Fuel Toll Act, CAP 220. According to the Act, the Board is mandated to perform three core functions:

- Mobilize funds for road maintenance,
- Disburse funds to road agencies, and
- Monitor the use of the funds to ensure value for money.

The Fund's sources of revenue include a fuel levy, transit charges, and overloading-related fees.

- **Fuel levy:** The fuel levy is the primary source of revenue for the Roads Fund. In the last five years, the fuel levy contributed more than 90% of the annual total revenue of the Fund. The Tanzania Revenue Authority (TRA) collects the levy at source from imported diesel and petrol. As of 1st July 2021, the rate stands at TZS 363 per litre of petrol or diesel meant for the local market.
- **Transit charges:** Transit charges are imposed on foreign-registered commercial vehicles pursuant to the Foreign Vehicles Transit Charges Act, Cap. 84. The current rates are USD 6 per 100 km for vehicles with up to three axles and USD 10 per 100 km for vehicles with more than three axles. The TRA also collects these charges, which contribute approximately 3% of the Fund's revenue.
- **Overloading-related fees:** Overloading-related fees include two types of charges: (i) fees charged on vehicles when their axle load, load from a group of axles, or gross vehicle mass exceeds the prescribed legal limits at any point on public roads; and (ii) fees imposed on vehicles carrying abnormal loads, which by their nature unavoidably exceed legal load and/or dimensional limits. These fees are collected at weighbridge stations and serve as a preventive measure to protect roads from premature failure. Charges are applied according to the rates specified in the East African Community Vehicle Load Control (Enforcement Measures) Regulations, 2018.

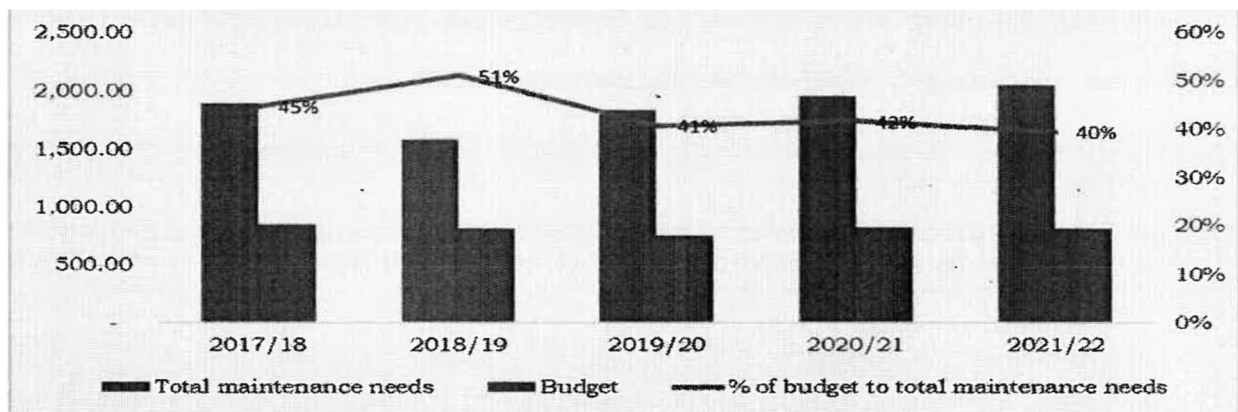
Following the amendment of the Roads and Fuels Tolls Act in June 2021, a fuel levy of TZS 363 per litre is charged on diesel or petrol. Of this amount, TZS 100 per litre is deposited in the TARURA Fund and used to finance the development and rehabilitation of district roads. Based on the approved allocation formula, 70% and 30% of the remaining TZS 263 are designated for national and district roads, respectively. Applying the 90:10 allocation ratio between maintenance and development works, 10% of the 70% is allocated to the MoWT to support development projects and policy issues, while the remaining 90% is earmarked for TANROADS for the maintenance of trunk and regional roads. Similarly, 10% of 30% is allocated to the PO-RALG to support development projects and policy issues for district roads, and the remaining 90% is allocated to TARURA for maintenance of district roads.

However, the approved budget only sufficed to meet 40% of the financial requirements for road maintenance as reported by implementing agencies such as TANROADS and TARURA, according to the 15th Joint Transport Sector Review (2022). The road maintenance financing gap, along with the increased demand for funds to address emergency works from heavy rains, remained the primary challenge for the Board.

Table 2.5.1 Trend of Annual Revenue Collection (TZS Billion)

Source of Revenue	2017/18	2018/19	2019/20	2020/21	2021/22
Fuel Levy	791.2	747.2	780.6	868.4	980.3
Transit Charges	15.0	22.8	25.8	30.8	46.7
Overloading Fees	12.0	9.5	21.7	12.0	25.5
Roads Reserve User Charges	-	-	21.7	4.0	6.6
Total	818.2	779.4	849.8	915.2	1,059.1

Source: Roads Fund Board. 2022.11. 15th Joint Transport Sector Review



Source: Roads Fund Board. 2022.11. 15th Joint Transport Sector Review

Figure 2.5.1 Percentage Coverage of Total Maintenance Needs

The Board continued to implement and promote measures aimed at reducing the financing gap, including measures to increase revenue and lower maintenance costs. Specifically, it submitted a proposal to the Government to introduce a levy on compressed natural gas (CNG) used to propel vehicles, as a means of sustaining Roads Fund revenue, and introduce weight-distance charges. However, the proposal was not approved.

(2) TANROADS

The Tanzania National Roads Agency (TANROADS) was established in July 2000. The agency is responsible for managing a total of 36,362 km of national roads, comprising 12,216 km of trunk roads and 24,146 km of regional roads. As of June 2022, 11,513 km (32%) of this network is paved. TANROADS is mandated to design, rehabilitate, and construct 58 airports.

The agency is also responsible for axle load control and oversees the operations of the Central Materials Laboratory and Regional Materials Laboratories, which are tasked with conducting materials testing and researching new road construction technologies.

Table 2.5.2 TANROADS' National Roads Network

Road Type		Nationwide		Dar es Salaam	
		Length (km)	Total Length (km)	Length (km)	Total Length (km)
Trunk Roads	Paved	9,254	12,216	120	120
	Unpaved	2,962		0	
Regional Roads	Paved	2,259	24,146	224	399
	Unpaved	21,887		175	
Total		36,362	36,362	519	519

Source: TANROADS. 2022.11. 15th Joint Transport Sector Review

In the fiscal year (FY) 2021/22, the agency planned to upgrade 492 km of trunk roads from gravel to bitumen standard. Of this target, 274 km (59%) was achieved, compared to 91% in FY 2020/21. With regard to regional roads, the plan was to upgrade 103 km, of which a total of 45 km (45%) was achieved in FY 2021/22, compared to 37% in FY 2020/21. The overall underachievement is attributed to unfavourable weather conditions and the untimely disbursement of funds.

The allocated development budget for trunk and regional roads in FY 2021/22, in both local and foreign currencies, was TZS 803 billion. However, actual expenditure reached TZS 1,229 billion, representing 153% of the allocated budget, compared to 85% expenditure in FY 2020/21. The higher-than-budgeted

expenditure was due to the Government’s initiative to settle outstanding payments owed to Contractors and Consultants.

TANROADS continues to face several major challenges. Notably, the maintenance budget remains inadequate, currently covering only 38% of actual requirements. In addition, there is insufficient financing for development projects, limited technical and management capacity among some contractors and consultants, and persistent challenges associated to the acquisition of the right of way.

Another major challenge is the delay in obtaining “no objection” approvals for donor-funded projects. In several instances, the no objection for contract signing has been delayed by more than ten (10) months after all tender evaluations have been completed. Such delays hinder project implementation and disrupt scheduled timelines.

(3) TARURA

The Tanzania Rural and Urban Roads Agency (TARURA) is an executive agency operating under the President’s Office Regional Administration and Local Government (PO-RALG). It is mandated to develop and maintain district roads across the country. As of June 2022, the district road network under TARURA comprises a total length of 144,430 km. Of this network, 2,636 km (1.8%) are paved, 31,965 km (22.1%) are gravel, and 109,829 km (76.0%) are earth roads.

Since Dar es Salaam comprises five (5) districts—Kinondoni, Ubungo, Ilala, Temeke and Kigamboni—the road network lengths for each district are presented in Table 2.5.3.

Table 2.5.3 TARURA’s District Roads Network

Surface Type	Nationwide	Dar es Salaam					Total
		Kinondoni	Ubungo	Ilala	Temeke	Kigamboni	
Paved	2,636	172	53	142	142	5	514
Gravel	31,965	623	209	346	107	325	1,611
Earth	109,829	899	315	648	399	705	2,966
Total	144,430	1,694	577	1,136	648	1,035	5,091

Source: TARURA. 2022.11. 15th Joint Transport Sector Review. Official Website

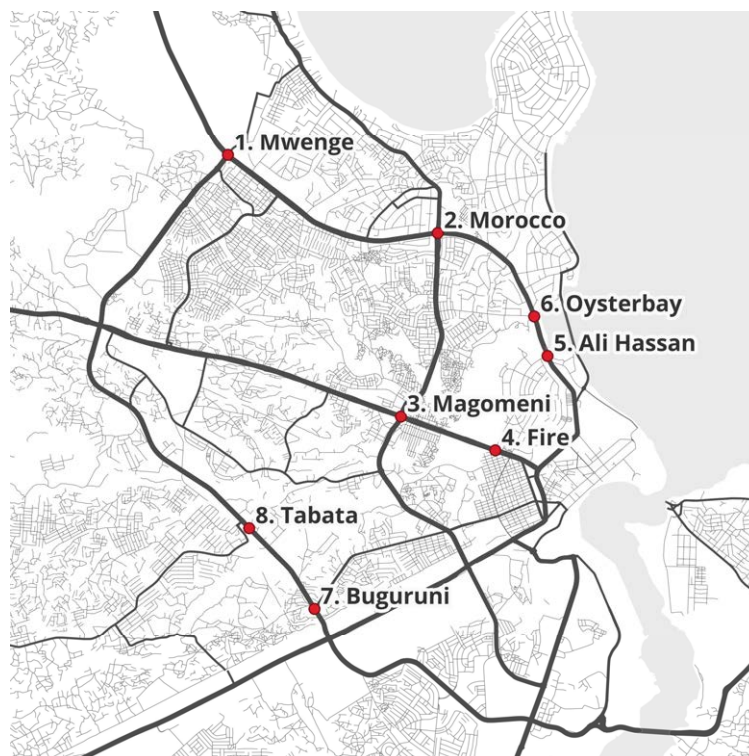
2.6 Review of Previous Studies

(1) TANROADS' Eight Critical Intersections

Improvements to intersections in Dar es Salaam through grade separation have been implemented in recent years, notably the construction of the TAZARA flyover and the Ubungo interchange. TANROADS has allocated maintenance funds in recent years to carry out minor improvements at several intersections along the trunk roads.

In response to growing traffic demands, TANROADS conducted a feasibility study and developed detailed designs for eight critical intersections that play a vital role in traffic management in Dar es Salaam. These intersections were selected based on multiple criteria, including operational sufficiency, truck activity, BRT plans, and functional road classification. These factors collectively informed the prioritization of intersections for future enhancements. The selected intersections and their respective roads are as follows:

- Mwenge Intersection (Sam Nujoma Road / New Bagamoyo Road)
- Morocco Intersection (New Bagamoyo Road / Kawawa Road)
- Magomeni Intersection (Kawawa Road / Morogoro Road)
- Fire Intersection (The United Nations Road / Morogoro Road)
- Ali Hassan Intersection (A. H. Mwinyi Road / United Nations intersection at Selander Bridge)
- Oysterbay Intersection (Ali Hassan Mwinyi Road / Kinondoni Road)
- Buguruni Intersection (N. Mandela Road / Uhuru Street)
- Tabata Intersection (N. Mandela Road / Tabata to Kinyerezi Road)



Source: JICA Survey Team

Figure 2.6.1 Locations of Eight Critical Intersections

The study included the following key components:

- Evaluation and analysis of the existing traffic situation and characteristics as of 2017.
- Forecasting of traffic demand for the target years 2031 and 2041.
- Analysis of future traffic scenarios with and without various development alternatives.
- Comparison and evaluation of development alternatives, including construction phasing (technical and financial assessment).
- Estimation of preliminary construction costs for each development alternative.
- Identification of the optimum development alternative and its associated construction elements.

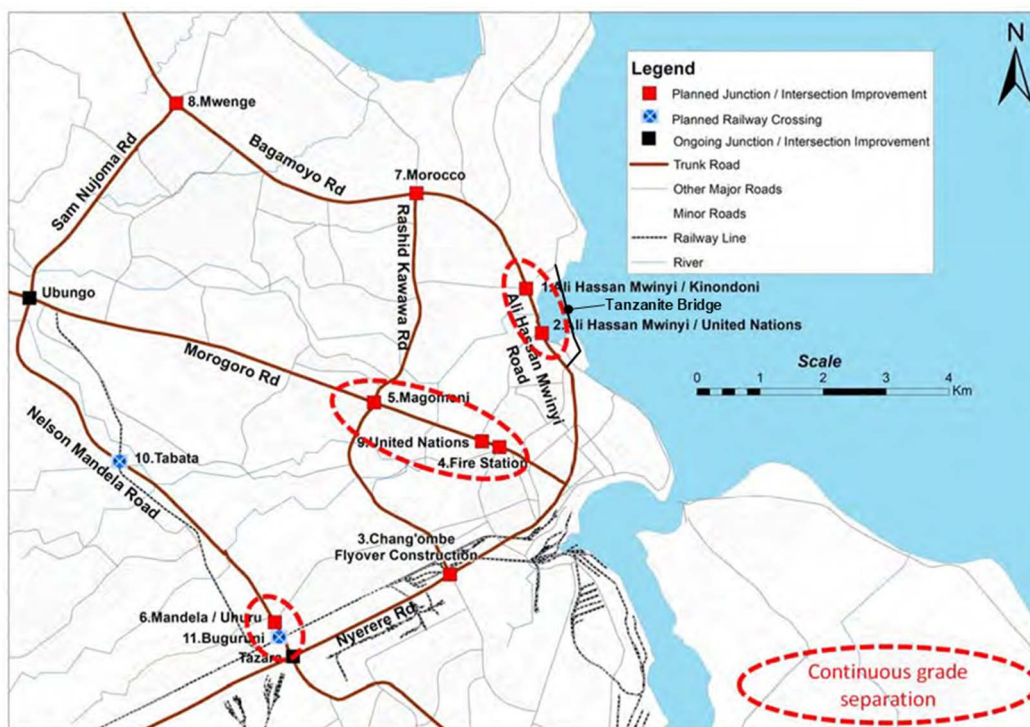
(2) Revised M/P's 11 Intersections

Improvement of the intersections into safer and more resilient structures is one of the twelve strategic targets outlined in the Revised M/P. The plan focuses on the grade separation of eleven major intersections, as shown in Figure 2.6.2. To ensure the efficient implementation of intersection improvements, a prioritization framework was proposed based on evaluation factors such as traffic congestion levels, traffic accident frequency, and flooding risks. The results of this prioritization are presented in Table 2.6.1.

The Revised M/P also recommended continuous grade separation for intersections that are located close to each other particularly along the following three sections:

- Ali Hassan Mwinyi Road, between Kinondoni Road and United Nations Road
- Morogoro Road, between Magomeni and the Fire Station, passing over the Jangwani River
- Nelson Mandela Road, between Uhuru Street and the Buguruni Railway Crossing

However, the above evaluation did not consider the construction of the 2nd Selander Bridge (called Tanzanite Bridge). Since the completion of the bridge in 2022, traffic congestion along Ali Hassan Mwinyi Road has significantly decreased. Consequently, the priority for grade separation at the intersections along this corridor has been reduced.



Source: JICA. 2018. Project for Revision of the Dar es Salaam Urban Transport Master Plan

Figure 2.6.2 Locations of 11 Intersections for Grade Separation Recommended by Revised M/P

Table 2.6.1 Priority of Intersections Recommended by Revised M/P

Priority	Intersection Name	Road Name	Road Name	Flooding Risk	No. of Accident	Travel Time Reduction
1	Chang’ombe	Nyerere Road	Kawawa Road	Low	29	444 sec
	Magomeni	Morogoro Road	Kawawa Road	Low	10	79 sec
	Mwenge	New Bagamoyo Road	Nelson Mandela Road	Moderate	9	308 sec
	Morocco	New Bagamoyo Road	Kawawa Road	Moderate	17	105 sec
2	Ali Hassan Mwinyi / Kinondoni	Ali Hassan Mwinyi Road	Kinondoni Road	High	6	166 sec
	Ali Hassan Mwinyi / UN Road	Ali Hassan Mwinyi Road	UN Road	High	0	189 sec
	Fire Station	Morogoro Road	Msimbazi Street	Low	1	95 sec
	UN	Morogoro Road	UN Road	Low	0	38 sec
3	Buguruni	Uhuru Street	Nelson Mandela Road	Low	0	244 sec
	Tabata Railway Crossing	Commuter Rail	Nelson Mandela Road	Low	0	50 sec
	Buguruni Railway Crossing	Commuter Rail	Nelson Mandela Road	Low	0	241 sec

Source: JICA. 2018. Project for Revision of the Dar es Salaam Urban Transport Master Plan

(3) Data Collection Survey on Urban Transportation in Dar es Salaam

In 2020, JICA conducted a “Data Collection Survey on Urban Transportation in Dar es Salaam” to assess the impacts of ongoing urban transport improvement projects and explore the feasibility of introducing Japanese technologies. The survey focused on selected intersections, including the eleven intersections proposed in the Revised M/P, the eight intersections previously studied by TANROADS, and the TAZARA Intersection.

The prioritization of intersections for improvement was based on the following criteria:

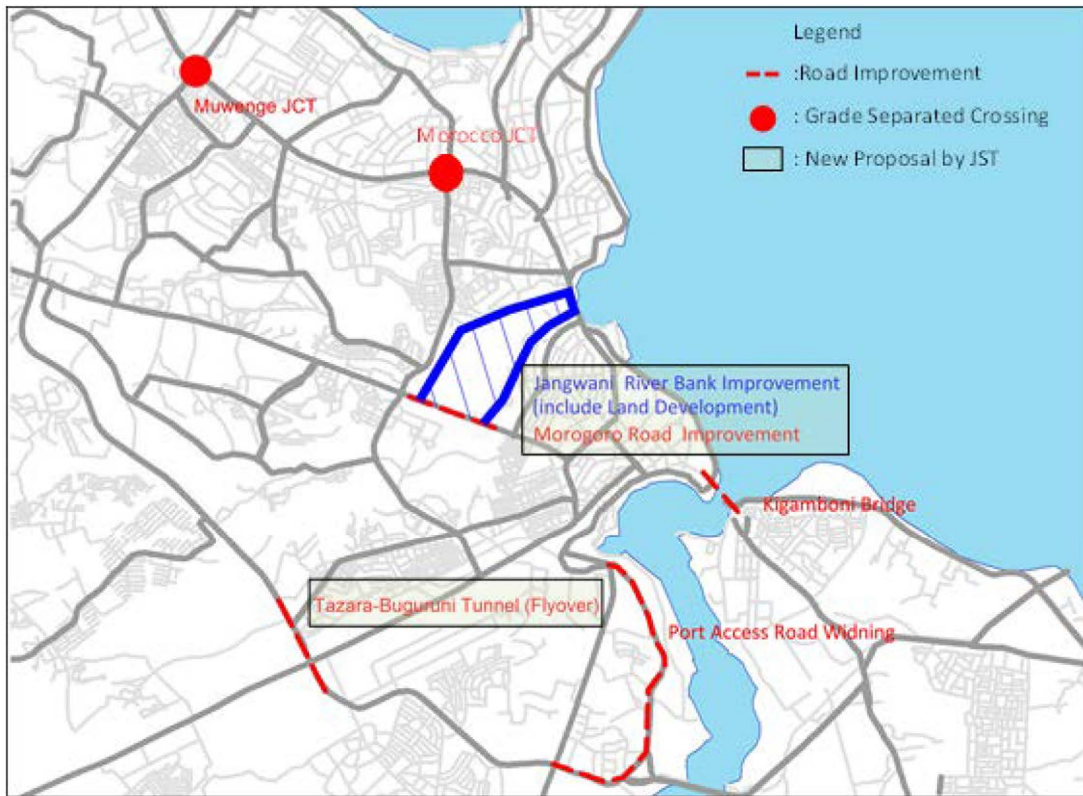
- Future congestion: Evaluation of the projected level of traffic saturation by 2031 in a “without project” scenario, which served as the primary indicator for intervention need.
- Reduced maintenance costs: Assessment of heavy traffic volume to estimate potential reductions in pavement damage and maintenance costs, as heavy vehicles operating at low speeds accelerate road deterioration.
- Flood risk: Analysis of the likelihood of road closures due to flooding, especially in known flood-prone areas.
- Traffic accident risk: Use of historical traffic accident data to assess the safety risk associated with each intersection.
- Government policies: Consideration of existing grade separation plans and national infrastructure development priorities.

Based on the results of the evaluation, the Mwenge, Buguruni, and TAZARA Intersections were identified as high-priority locations for improvement. The survey also highlighted several institutional and technical challenges related to the implementation of the proposed railway projects under the revised M/P. These included the need for organizational restructuring, addressing human resource shortages, managing land acquisition risks, and acquiring technical knowledge on electrified railway design, as well as the operation and maintenance of urban railways. The study emphasized the importance of learning from international experience, particularly from Japan to address these challenges effectively.

In addition, the survey examined short-, medium-, and long-term strategies to mitigate traffic congestion. These strategies included increasing road network density, implementing flood disaster prevention measures, promoting modal shift to public transportation, and enhancing freight transport systems.

Based on its findings, the study recommended the implementation of the following priority projects:

- Grade Separation at Mwenge Intersection: Identified as a high-priority project that can be implemented independently.
- Widening of the northern part of the port access road: Aimed at providing an alternative route for port-bound traffic, thereby alleviating congestion on Nelson Mandela Road.
- Continuous grade separation between Buguruni and TAZARA Intersections: Intended to reduce congestion and promote a modal shift to public transport. Integrated development of a terminal and intersection was also proposed.
- Grade Separation of Morocco Intersection and Terminal Development: Identified as a potential site for the development of a public transport terminal. The integration of the terminal with intersection upgrades would facilitate modal shift to public transport and reduce peripheral traffic congestion.
- Grade Separation of Morocco and Magomeni Intersections: Aimed at improving the functionality of the ring road network and reduce citywide traffic congestion.
- Jangwani River Bank Improvement and Morogoro Road Improvement: Raising the road level near the Jangwani River along Morogoro Road would mitigate recurrent flooding and reduce road closures, thereby improving overall traffic flow.



Source: JICA. 2020. Data Collection Survey on Urban Transportation in Dar es Salaam

Figure 2.6.3 Proposed Projects by Data Collection Survey

2.7 Review of Completed and Ongoing Grade Separation Projects

(1) TAZARA Flyover

The TAZARA Flyover—also known as the Mfugale Flyover—is the first grade-separated flyover constructed in Dar es Salaam. Located at the intersection of Nyerere Road and Nelson Mandela Road, it was developed under Japan’s Grant Aid and completed in 2018. The flyover was named in honor of Engineer Patrick Mfugale, the former Chief Executive Officer of TANROADS.

The primary objective of the TAZARA Flyover was to alleviate traffic congestion and improve vehicular flow at this critical intersection. Before its construction, the junction was a major bottleneck, characterized by frequent delays that significantly disrupted traffic movement. The completion of the flyover now allows vehicles to bypass the intersection without interruption, thereby enhancing overall traffic efficiency—particularly for routes connecting Julius Nyerere International Airport and the suburban areas of the city center.

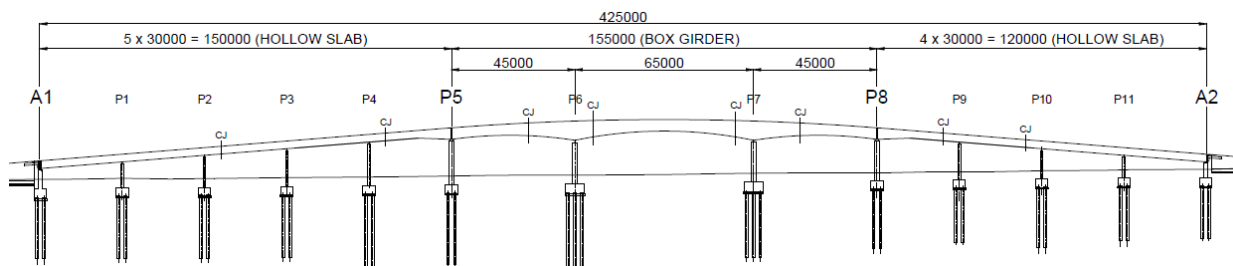


Source: JICA Survey Team

Figure 2.7.1 Photos of TAZARA Flyover

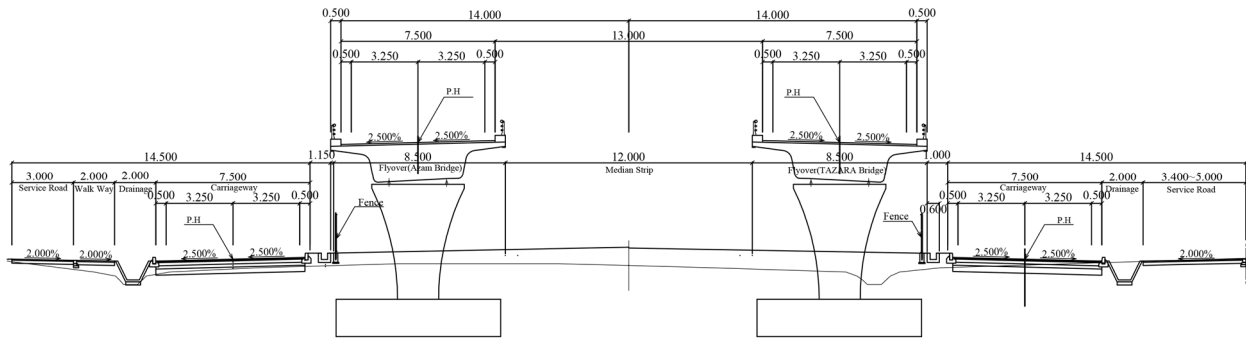
The structural specifications of the TAZARA Flyover are as follows:

- Superstructure: 3-span continuous PC box-girder bridge (45 + 65 + 45 = 155 m) with approach sections of 5-span continuous PC hollow slab bridge (west side 5 × 30 = 150 m) and 4-span continuous PC hollow slab bridge (east side, 4 × 30 = 120 m)
- Substructure: RC piers (Ginkgo shape)
- Foundation structure: Cast-in-place piles (φ1.0 m)
- Bridge length: 425 m
- Bridge width: 7.5 m for 2 lanes per direction (0.5 m shoulder and 3.25 m lane widths)
- Center margin: 12 m for provision of BRT construction in future
- Normal cross slope: 2.5%
- Max. vertical grade: 4.0%
- Vertical clearance: 5.5 m



Source: JICA. 2012. Preparatory Survey on the Project for Improvement of TAZARA Intersection

Figure 2.7.2 Profile View of TAZARA Flyover



Source: JICA. 2012. Preparatory Survey on the Project for Improvement of TAZARA Intersection

Figure 2.7.3 Typical Cross Section of TAZARA Flyover

During the construction of the TAZARA Flyover, local workers (maximum 430 people) received extensive training in Japanese-style safety and quality control practices, including the implementation of 5S activities —Sort, Straighten, Shine, Standardize, and Sustain. To ensure high construction quality and reduce construction time, the project employed standardized dimensions for bridge piers, prefabricated rebar, and system formwork. Consequently, construction was completed within 33 months (equivalent to approximately 2.57 million man-hours) without any reported accidents. The Government of Tanzania commended the project for its exemplary safety performance and rigorous quality management.

(2) Ubungu Interchange

The Ubungu Interchange, located at the intersection of Morogoro Road and Nelson Mandela Road/Sam Nujoma Road, is the second flyover constructed in Dar es Salaam. This significant transportation hub was developed as part of the BRT Phase 1 project, with financial support from the World Bank. Designed to alleviate traffic congestion and enhance urban connectivity, the interchange comprises two layered flyovers, with dedicated lanes for BRT buses positioned at the center of the structure.

Prior to its construction, the Ubungu intersection experienced substantial traffic congestion, resulting in frequent delays for commuters and freight vehicles. Following the completion of the interchange, traffic flow has improved substantially, reducing congestion.



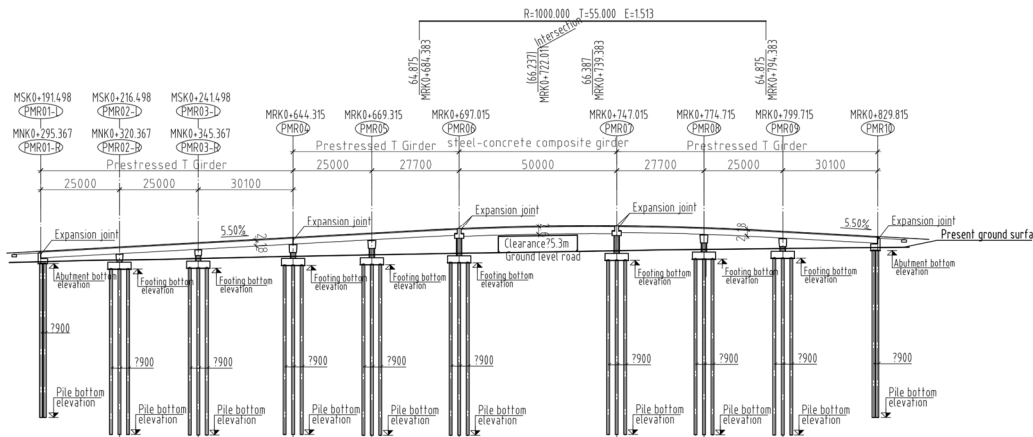
Source: JICA Survey Team

Figure 2.7.4 Photos of Ubungu Interchange

The structural specifications of the Ubungo Interchange are as follows:

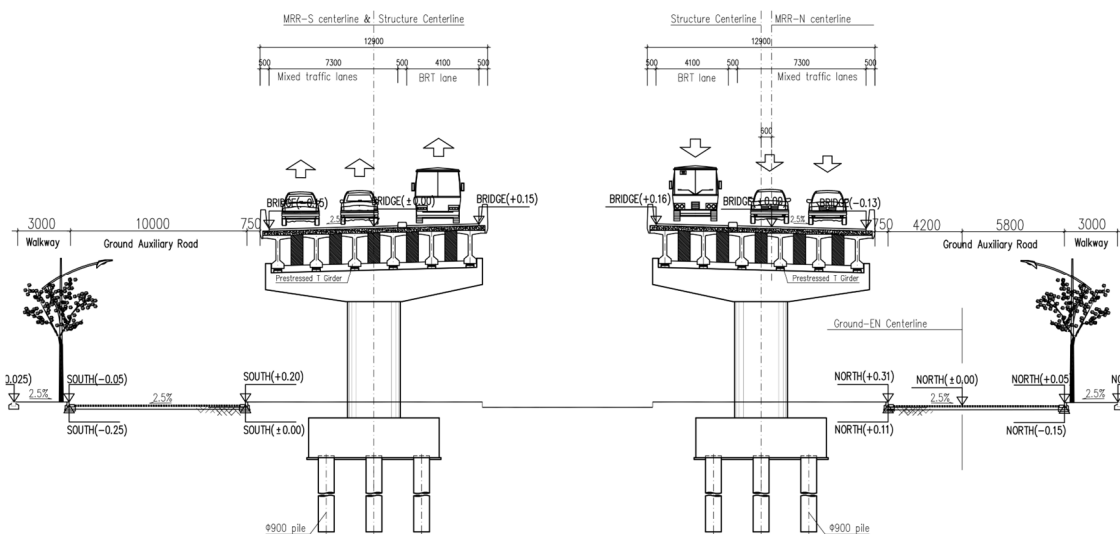
For Morogoro Road Direction (1st layer)

- Superstructure: 1-span steel-concrete composite girder bridge (50 m) with approach sections of 5-span prestressed T girder bridge ($2 \times 25 + 30.1 + 25 + 27.7 = 132.8$ m) and 3-span prestressed T girder bridge ($27.7 + 25 + 30.1 = 82.8$ m)
- Substructure: RC piers (circular shape)
- Foundation structure: Cast-in-place piles ($\phi 0.9$ m)
- Bridge length: 265.6 m
- Bridge width: 11.9 m for 2 lanes for mixed traffic and 1 lane for BRT per direction (0.8 m shoulder, 3.25 m lane widths and 4.1 m BRT lane)
- Normal cross slope: 2.5%
- Max. vertical grade: 5.5%
- Vertical clearance: 5.3 m



Source: TANROADS. 2018. Construction Drawing

Figure 2.7.5 Profile View of Ubungo Interchange (Morogoro Road)

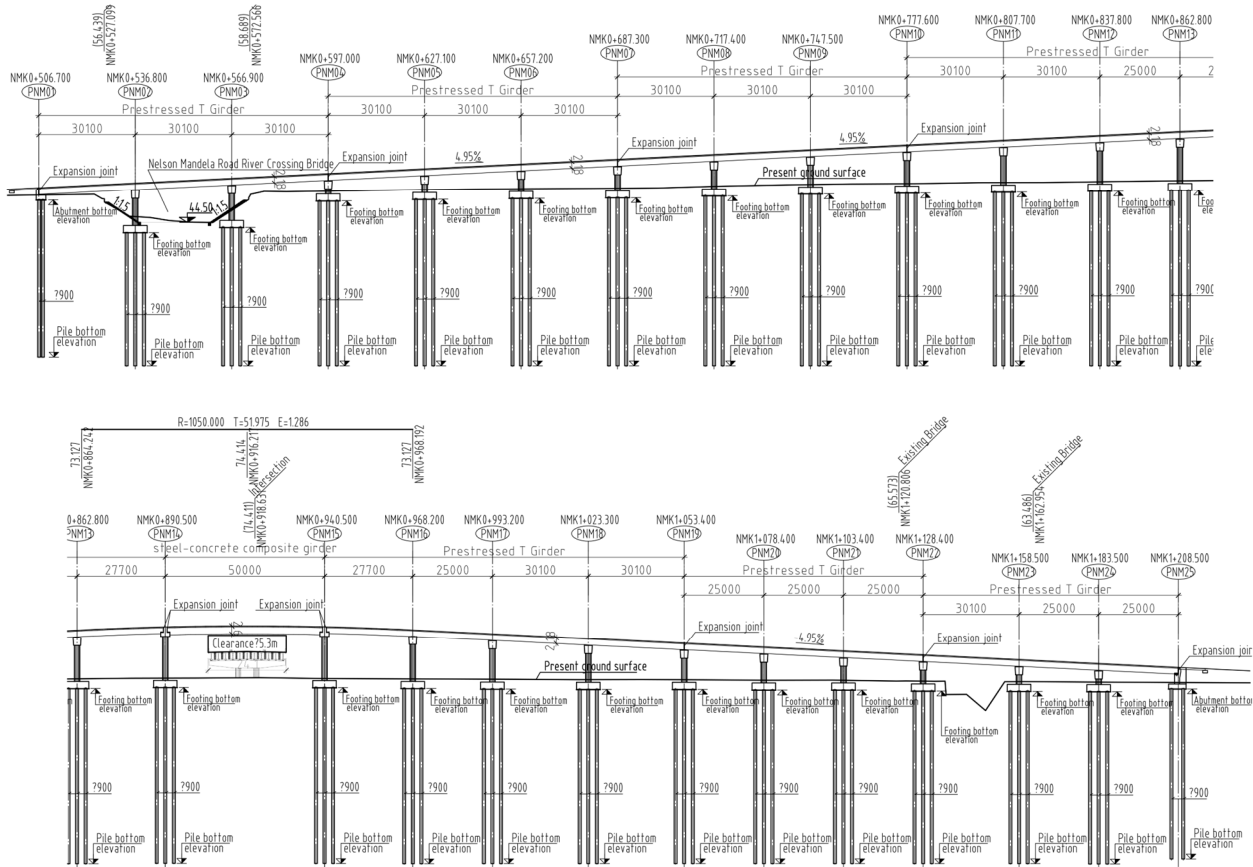


Source: TANROADS. 2018. Construction Drawing

Figure 2.7.6 Typical Cross Section of Ubungo Interchange (Morogoro Road)

For Nelson Mandela Road and Sam Nujoma Road Direction (2nd layer)

- Superstructure: 1-span steel-concrete composite girder bridge (50 m) with approach sections of 13-span prestressed T girder bridge ($11 \times 30.1 + 25 + 27.7 = 383.8$ m) and 10-span prestressed T girder bridge ($27.7 + 25 + 2 \times 30.1 + 3 \times 25 + 30.1 + 2 \times 25 = 268$ m)
- Substructure: RC piers (circular shape)
- Foundation structure: Cast-in-place piles ($\phi 0.9$ m)
- Bridge length: 701.8 m
- Bridge width: 24.1 m for 2 lanes for mixed traffic per direction (0.8 m shoulder and 3.50 m lane widths) and 2 BRT lanes (7.5 m) at the center
- Normal cross slope: 2.5%
- Max. vertical grade: 4.95%
- Vertical clearance: 5.3 m



Source: TANROADS. 2018. Construction Drawing

Figure 2.7.7 Profile View of Ubungo Interchange (Nelson Mandela - Sam Nujoma Road)

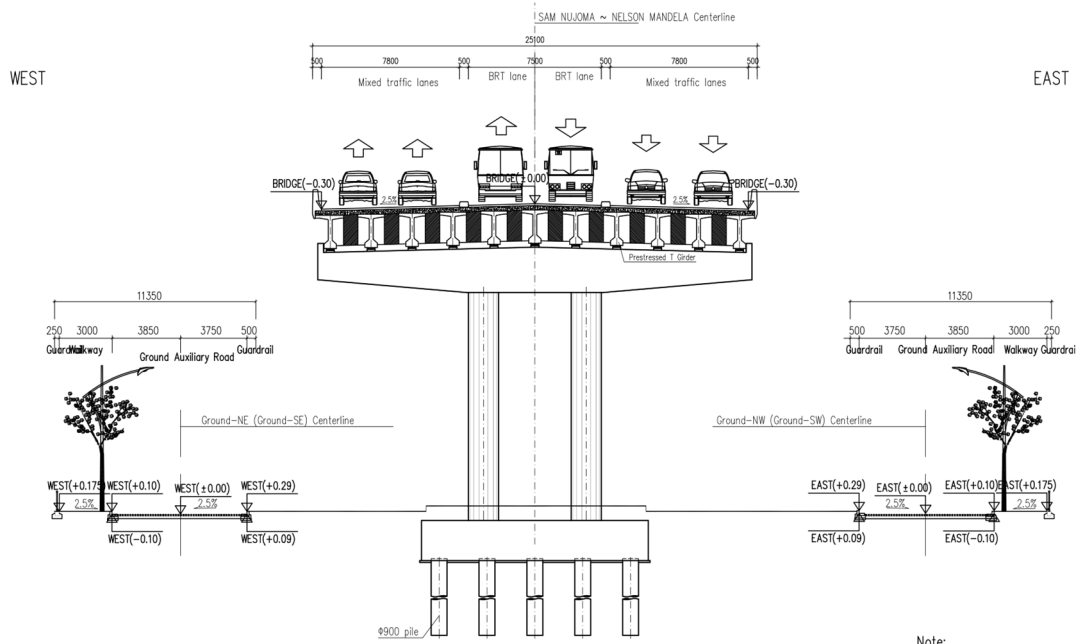


Figure 2.7.8 Typical Cross Section of Ubungo Interchange (Nelson Mandela - Sam Nujoma Road)

(3) Chang’ombe Flyover

The Chang’ombe Flyover was constructed at the intersection of Nyerere Road and Kawawa Road as part of the BRT Phase 2 project.

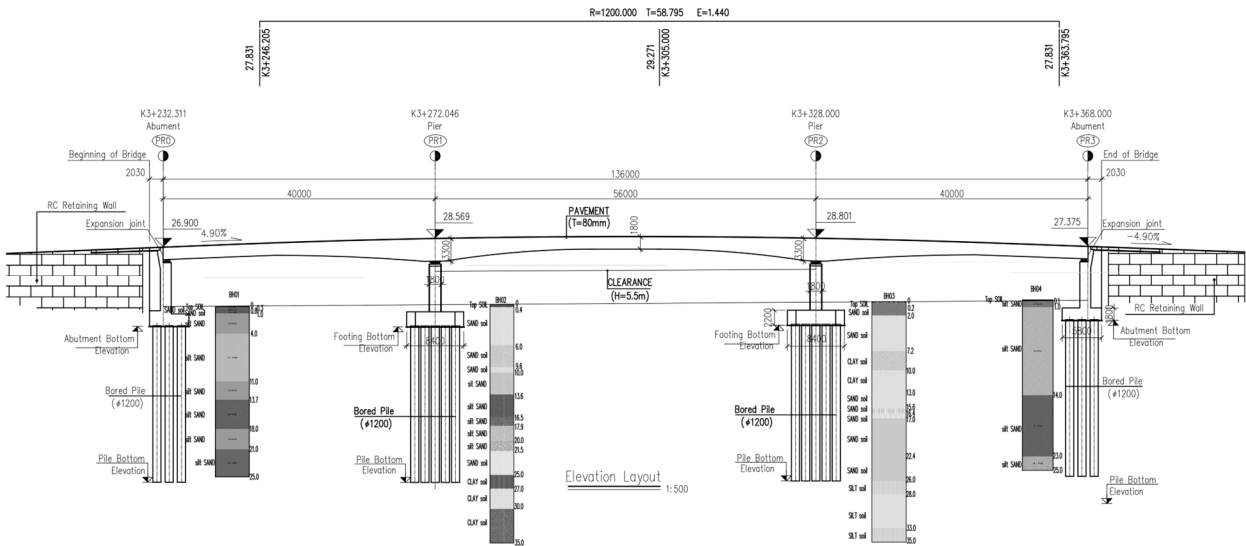


Source: JICA Survey Team

Figure 2.7.9 Photos of Chang’ombe Flyover

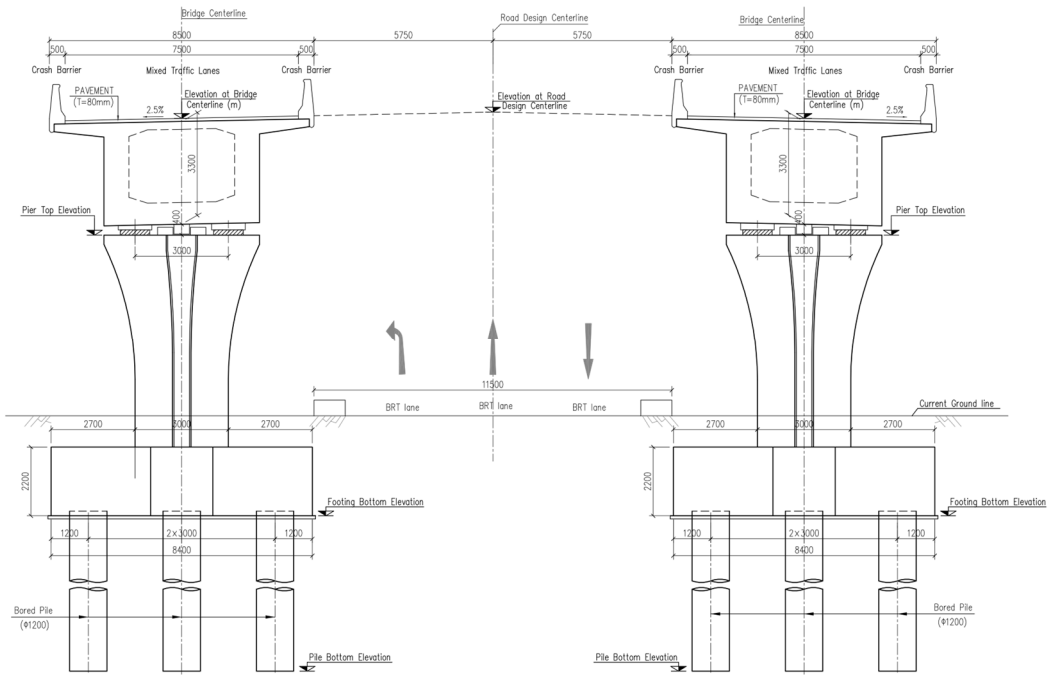
The structural specifications of the Chang’ombe Flyover are as follows:

- Superstructure: 3-span continuous PC box-girder bridge (40 + 56 + 40 = 136 m)
- Substructure: RC piers (Ginkgo shape)
- Foundation structure: Cast-in-place bored piles (φ1.2 m)
- Bridge length: 136 m
- Bridge width: 7.5 m for 2 lanes per direction (0.5 m shoulder and 3.25 m lane widths)
- Center margin: 11.5 m for provision of BRT lanes
- Normal cross slope: 2.5%
- Max. vertical grade: 4.9%
- Vertical clearance: 5.5 m



Source: TANROADS. 2020. BRT Phase 2 Construction Drawing

Figure 2.7.10 Profile View of Chang'ombe Flyover



Source: TANROADS. 2020. BRT Phase 2 Construction Drawing

Figure 2.7.11 Typical Cross Section of Chang'ombe Flyover

(4) Uhasibu Flyover

The Uhasibu Flyover was also constructed at the intersection of Kilwa Road and Nelson Mandela Road as part of the BRT Phase 2 project.

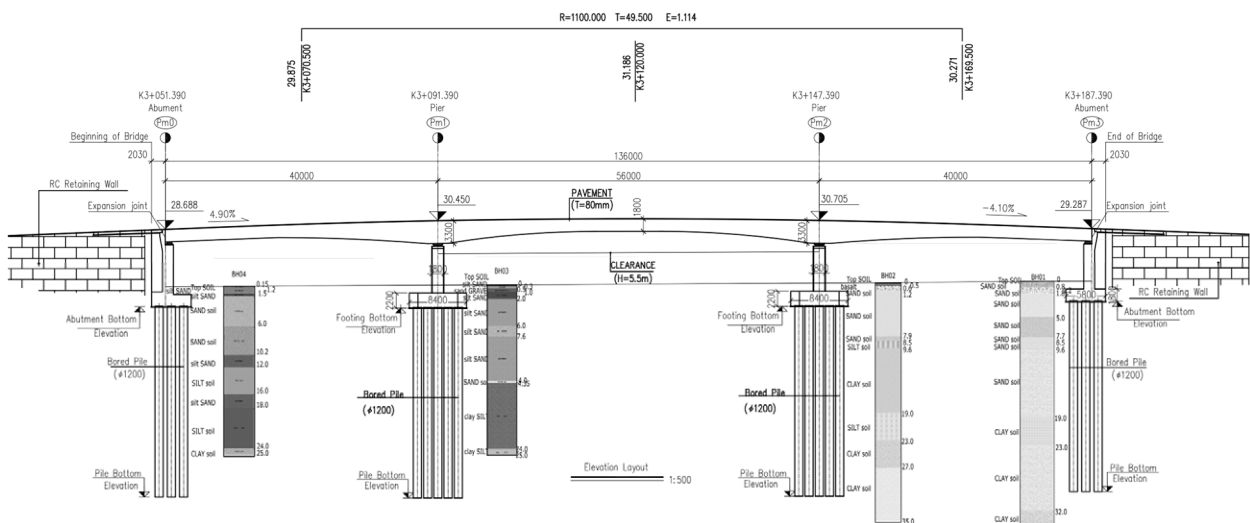


Source: JICA Survey Team

Figure 2.7.12 Photos of Uhasibu Flyover

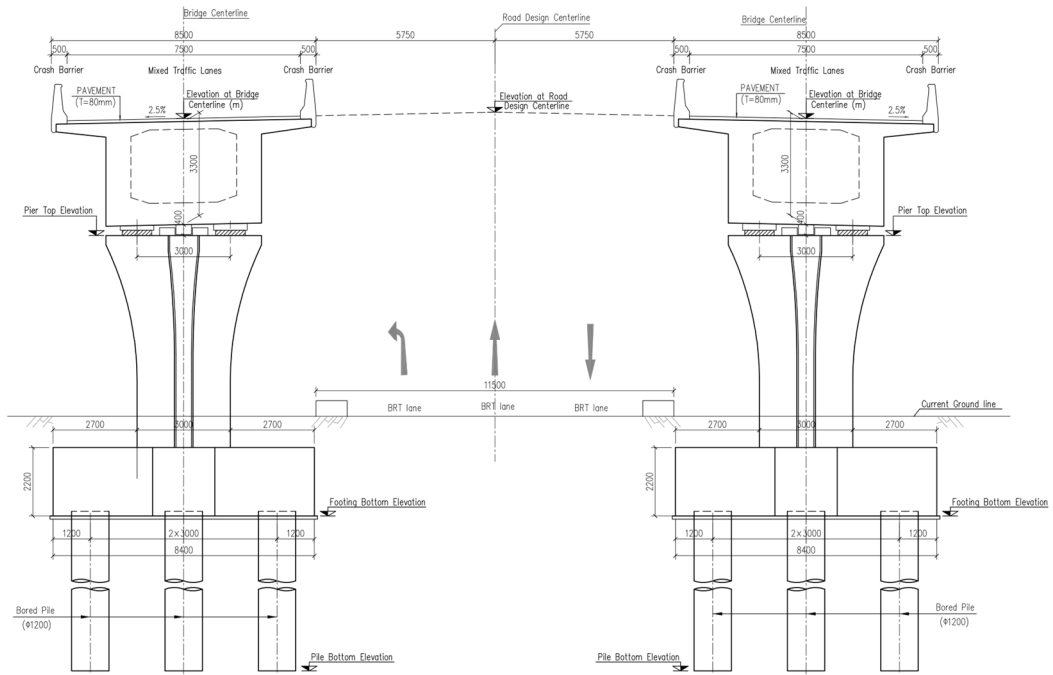
The structural specifications of the Uhasibu Flyover are as follows:

- Superstructure: 3-span continuous PC box-girder bridge (40 + 56 + 40 = 136 m)
- Substructure: RC piers (Ginkgo shape)
- Foundation structure: Cast-in-place bored piles (φ1.2 m)
- Bridge length: 136 m
- Bridge width: 7.5 m for 2 lanes per direction (0.5 m shoulder and 3.25 m lane widths)
- Center margin: 11.5 m for provision of BRT lanes
- Normal cross slope: 2.5%
- Max. vertical grade: 4.9%
- Vertical clearance: 5.5 m



Source: TANROADS. 2020. BRT Phase 2 Construction Drawing

Figure 2.7.13 Profile View of Uhasibu Flyover



Source: TANROADS. 2020. BRT Phase 2 Construction Drawing

Figure 2.7.14 Typical Cross Section of Uhasibu Flyover

3. Current Conditions at the Identified Intersections

3.1 Mwenge Intersection

(1) Current Road Conditions

Mwenge Intersection is a signalized, four-leg intersection connecting New Bagamoyo Road, Sam Nujoma Road, and Coca-Cola Road. New Bagamoyo Road is a four-lane radial-directional road linking the city center to Bagamoyo. Sam Nujoma Road is a four-lane ring road extending from Nelson Mandela Road, connects Mwenge and Ubungo. Beyond the intersection, it transitions into the two-lane Coca-Cola Road, which continues toward Old Bagamoyo Road.



Source: JICA Survey Team

Figure 3.1.1 Satellite Imagery of Mwenge Intersection

New Bagamoyo Road (Tegeta Side)

The section of New Bagamoyo Road from Mwenge to Tegeta was widened from two to four lanes under Japan’s Grant Aid projects, implemented between 2010 and 2014. At the approach to the intersection, the road has a right-of-way (ROW) width of approximately 50 to 60 m. As shown in Figure 3.1.3, the approaching direction comprises one (1) shared lane for left-turning and through traffic, one (1) through lane, and two (2) right-turning lanes over a 75 m stretch. In contrast, the outbound direction consists of two (2) lanes. The median is relatively wide, ranging from approximately 8.5 to 11.5 metres. No service road is provided in this section; however, a trapezoidal open ditch runs alongside the road for drainage.

A daladala bus stop exists in each traffic direction, approximately 175 meters from the intersection. These areas frequently become traffic bottlenecks, especially during peak hours, due to the irregular stopping behaviour of daladala buses when loading and unloading passengers. Approximately 560 meters from the intersection lies the 30-meter-long Mlalakuwa Bridge, featuring an 8.0 meter roadway (including 0.5-meter shoulder on both sides, and 3.5-meter-wide two-lane carriageway) and a 1.5 meter sidewalk on each side.



Approach Section of Intersection



Daladala Bus Stop



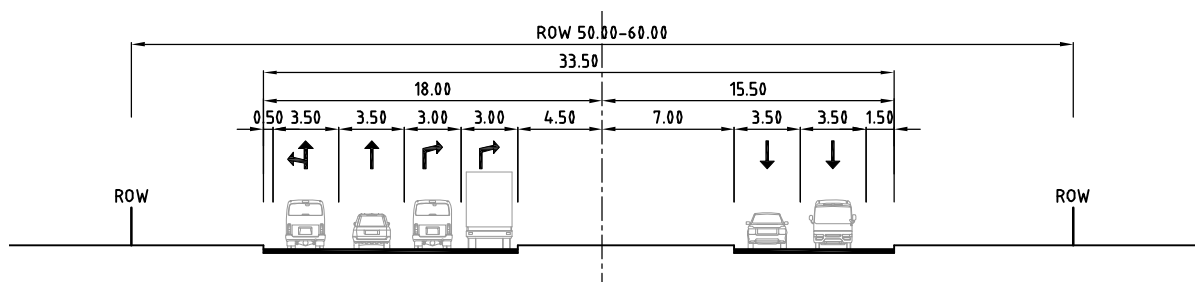
Outbound Lanes



Approaching Lanes

Source: JICA Survey Team

Figure 3.1.2 Current Conditions of New Bagamoyo Road at Mwenge (Tegeta Side)



Source: JICA Survey Team

Figure 3.1.3 Current Road Cross Section of New Bagamoyo Road at Mwenge (Tegeta Side)



Mwenge Intersection



Suma Junction



Mlakuwa Bridge

Source: JICA Survey Team

Figure 3.1.4 Aerial Photography of New Bagamoyo Road at Mwenge (Tegeta Side)

New Bagamoyo Road (City Center Side)

The section of New Bagamoyo Road between Mwenge and Morocco was widened from a two to four lanes through Japan’s Grant Aid projects, implemented between 2018 and 2021. At the approach to the intersection, the road has a right-of-way (ROW) width of approximately 60 to 70 meters. As illustrated in Figure 3.1.6, the approaching direction consists of one (1) left-turning lane, two (2) through lanes, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. The median is relatively wide, ranging from approximately 9.0 to 14.5 meters. On the southern side of the road, a 6.5-meter-wide service road allows bidirectional traffic movement to Sam Nujoma Road. Additionally, a second service road on the northern side begins approximately 60 meters from the intersection.



Approaching Section of Intersection



Sidewalk and Trapezoidal Open Ditch



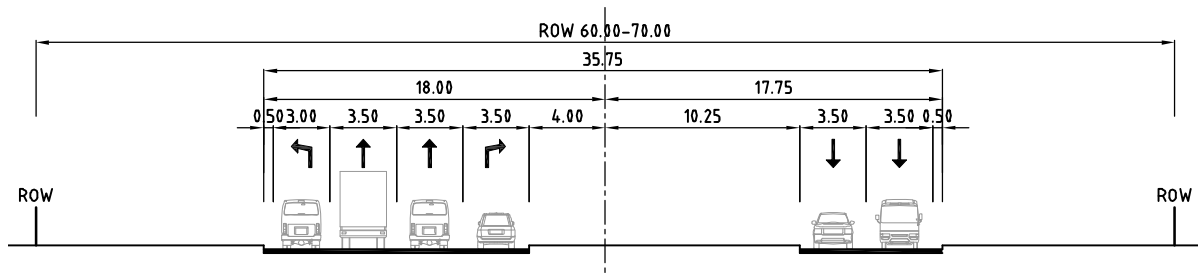
Approaching Lanes



Outbound Lanes

Source: JICA Survey Team

Figure 3.1.5 Current Conditions of New Bagamoyo Road at Mwenge (City Center Side)



Source: JICA Survey Team

Figure 3.1.6 Current Road Cross Section of New Bagamoyo Road at Mwenge (City Center Side)



Mwenge Intersection



Construction of BRT Station (Mwenge / ITV Station) is planned.



Intersection with Soldering Road

Source: JICA Survey Team

Figure 3.1.7 Aerial Photography of New Bagamoyo Road at Mwenge (City Center Side)

Sam Nujoma Road

Sam Nujoma Road has a right-of-way (ROW) width of approximately 50 meters at the approach to the intersection. As shown in Figure 3.1.9, the approaching direction consists of one (1) shared lane for left-turning and through traffic, one (1) through lane, and two (2) right-turning lanes. In the outbound direction, three (3) lanes are provided. The median is relatively wide, ranging from approximately 6.0 to 9.0 meters. A 3.5-meter-wide service road on the west side of the main carriageway merges with the main traffic approximately 50 meters before the intersection.



Approaching Section of Intersection



Sidewalk and Trapezoidal Open Ditch



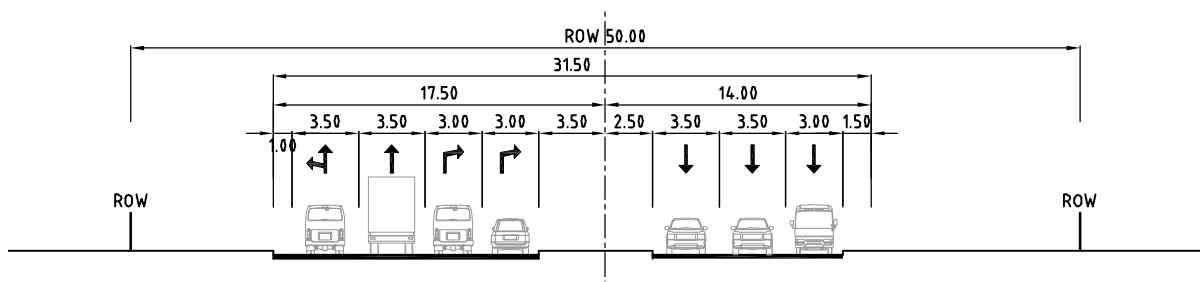
Approaching Lanes



Outbound Lanes

Source: JICA Survey Team

Figure 3.1.8 Current Conditions of Sam Nujoma Road at Mwenge



Source: JICA Survey Team

Figure 3.1.9 Current Road Cross Section of Sam Nujoma Road at Mwenge



Mwenge Intersection



Construction of BRT Terminal Station (Mwenge Terminal) is planned.



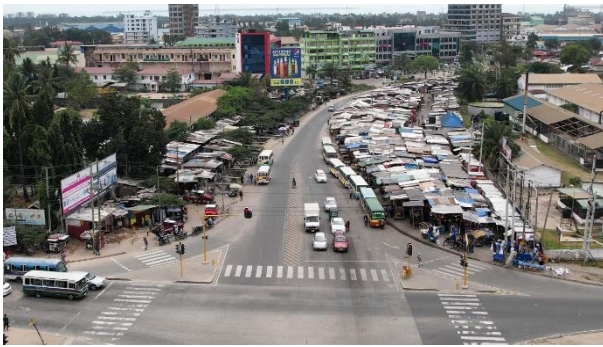
Roundabout with TRA Road

Source: JICA Survey Team

Figure 3.1.10 Aerial Photography of Sam Nujoma Road at Mwenge

Coca-Cola Road

Coca-Cola Road is a two-lane road connecting New Bagamoyo Road and Old Bagamoyo Road. As shown in Figure 3.1.12, the approaching direction consists of one (1) shared lane for left-turning and through traffic, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. The road derives its name from a nearby beverage factory. Although the right-of-way (ROW) is sufficiently wide at approximately 60 meters, the road is bordered by a roadside market called “Wamachinga Market”. This market is an initiative by the Kinondoni Municipal Council to formalize the street vendors’ business activities.



Approaching Section of Intersection



2-Lane Road Section



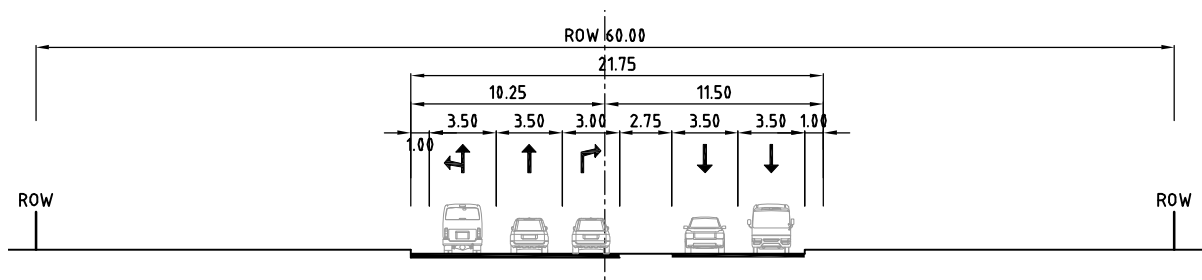
Roadside Shops (Wamachinga Market)



A Trapezoidal Open Ditch

Source: JICA Survey Team

Figure 3.1.11 Current Conditions of Coca-Cola Road at Mwenge



Source: JICA Survey Team

Figure 3.1.12 Current Road Cross Section of Coca-Cola Road at Mwenge



Source: JICA Survey Team

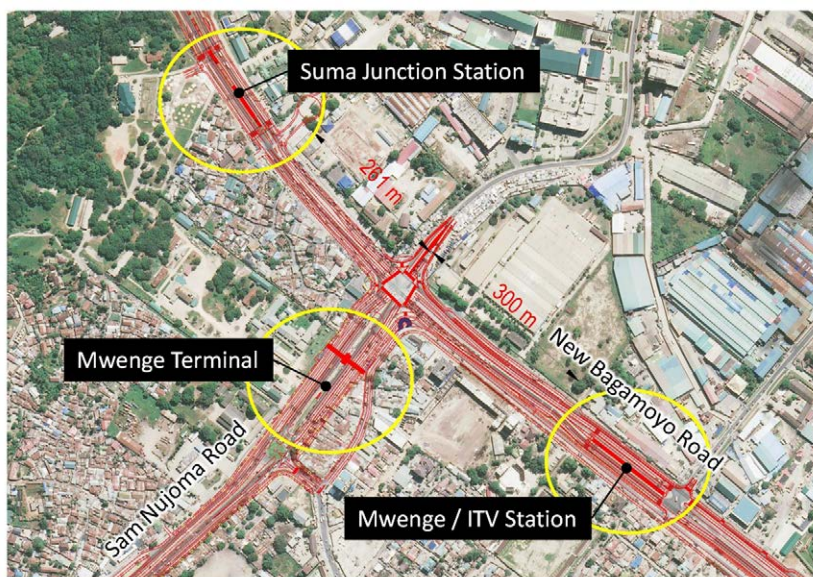
Figure 3.1.13 Aerial Photography of Coca-Cola Road at Mwenge

(2) BRT Plan

Mwenge Intersection forms part of the BRT Phase 4 corridor, which is currently under construction. The BRT Phase 4 project involves the construction of a 30.1-kilometer BRT corridor extending from the Maktaba/Bibi-Titi Road junction in the CBD—where it joins the BRT Phase 3 corridor—along Ali Hassan Mwinyi Road to Morocco, the terminal point of the existing BRT Phase 1 terminal. From Morocco, the corridor continues through Mwenge and terminates at Boko Basihaya. The corridor has a branch at Mwenge connecting to the BRT Phase 1 trunk route at Ubungo terminal through Sam Nujoma Road.

There are three (3) proposed BRT stations in the vicinity of Mwenge Intersection as follows:

- Suma Junction Station (New Bagamoyo Road)
- Mwenge / ITV Station (New Bagamoyo Road)
- Mwenge Terminal (Sam Nujoma Road)



Source: JICA Survey Team

Figure 3.1.14 BRT Plan at Mwenge Intersection

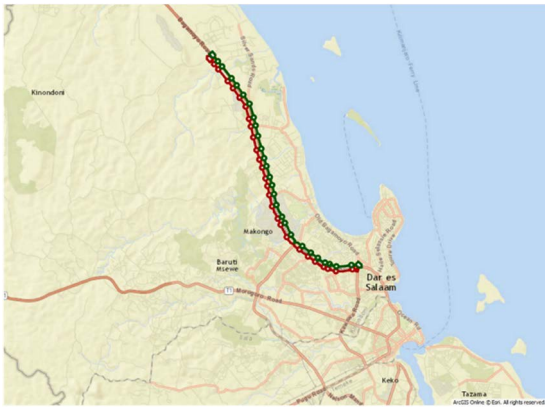
According to DART’s operations plan, BRT Phase 4 will include a total of seven (7) trunk service routes. These comprise five (5) regular (local) service routes, which stop at each station, and two (2) express service routes that bypass intermediate and low-demand stations, as shown in Figure 3.1.15.

Table 3.1.1 summarises the expected operational characteristics of the above BRT stations located near Mwenge intersection.

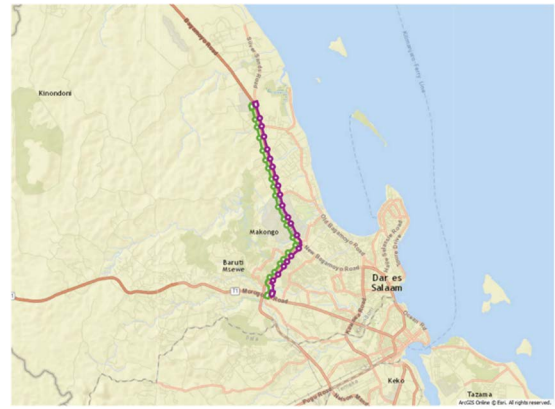
Table 3.1.1 BRT Phase 4 Bus Routes and Stations near Mwenge Intersection

Service	Section	Max Passenger	Peak Hourly Frequency	Headway (min)	Fleet	Suma Junction Station	Mwenge / ITV Station	Mwenge Terminal
BR402	Tegeta-Morocco	980	8	7.50	14	✓	✓	-
BR405	SalaSala-Ubungo	2,500	20	3.00	26	✓	-	✓
BR404	Mbezi Beach-Gerezani	3,360	27	2.25	47	✓	✓	-
BR401	Mwenge-Kivukoni	2,600	20	3.00	24	-	✓	✓
BR406	Ubungo-Morocco	2,910	24	2.50	22	-	✓	✓
BR4X3	Tegeta-Gerezani (Express)	4,820	40	1.50	81	-	✓	-
BR4X5	Tegeta-Ubungo (Express)	4,780	40	1.50	56	-	-	✓

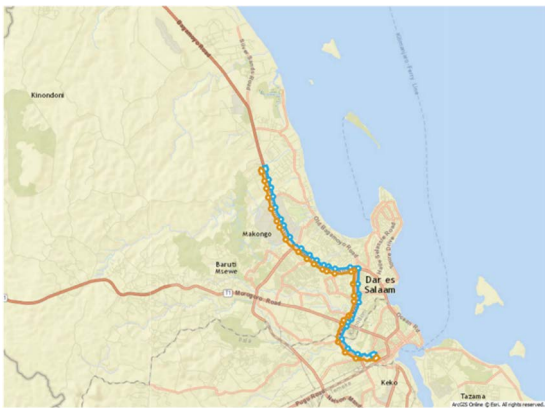
Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision



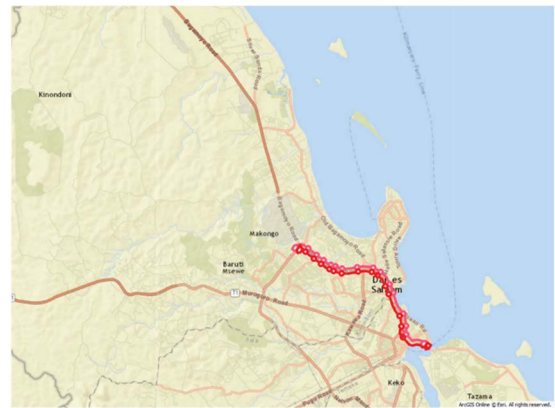
BR402: Tegeta-Morocco



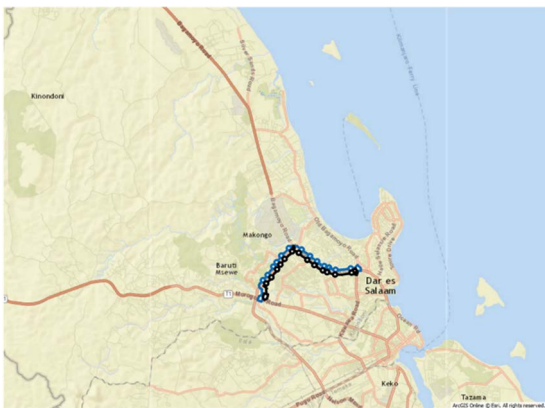
BR405: SalaSala-Ubungo



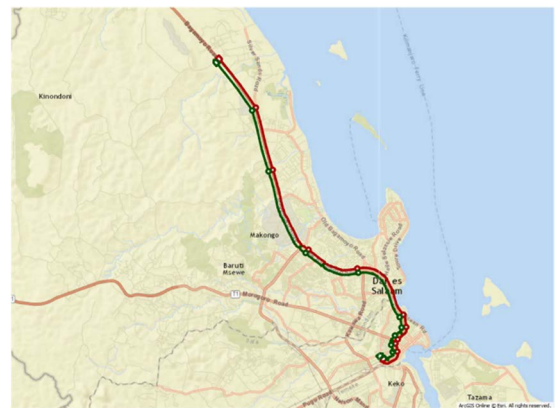
BR404: Mbezi Beach-Gerezani



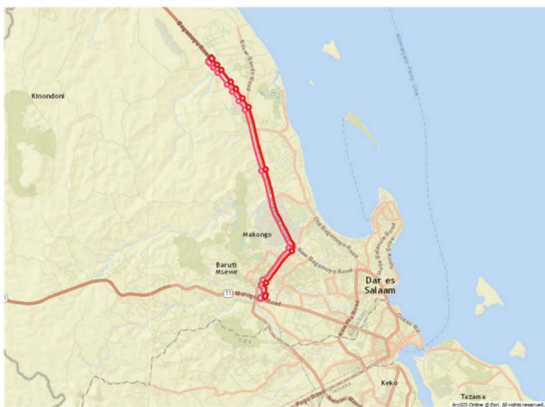
BR401: Mwenge-Kivukoni



BR406: Ubungo-Morocco



BR4X3: Tegeta-Gerezani (Express)



BR4X5: Tegeta-Ubungo (Express)

Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision

Figure 3.1.15 Route Maps for BRT Phase 4 (Proposed Trunk Services)

(3) Recommendation from TANROADS Study

TANROADS conducted a feasibility study and detailed engineering design for the grade separation of the Mwenge Intersection, under the study titled “Feasibility Study, Detailed Engineering Design, Environmental & Social Impact Assessment and Preparation of Tender Documents of Eight (8) Critical Intersections in Dar es Salaam City.(TRD/HQ/1047/2016/17).” The feasibility study report was submitted in July 2018, followed by the final design report in August 2019. However, TANROADS was not satisfied with the results and amended the contract with the consultant. Consequently, a revised report was submitted in May 2023.





The 2019 report considered the following alternatives:

- “Alternative 1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative 2: Construction of a two-lane flyover in each direction along New Bagamoyo Road, with traffic signal optimization.”
- “Alternative 3: Construction of a two-lane flyover in each direction on New Bagamoyo Road and a 2-lane underpass in each direction along Sam Nujoma - Coca-Cola Road, with traffic signal optimization.”
- “Alternative 4: Construction of a two-lane flyover in each direction on New Bagamoyo Road (Level 1) and a three-lane flyover in each direction on Sam Nujoma - Coca-Cola Road (Level 2) with traffic signal optimization.”

The comparative analysis concluded that Alternatives 3 and 4 satisfied all technical and operational requirements. A phased construction approach was recommended to optimize financial resources, as follows:

- “Construct a two-lane flyover in each direction along New Bagamoyo Road with traffic signal optimization, before the year 2031.”
- “Construct a two-lane underpass in each direction along Sam Nujoma – Coca-Cola Road, before the year 2041.”

Table 3.1.2 Comparison of Alternative Options for Mwenge Intersection (TANROADS’ Study 2019)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Schematic Image				
Description	Improvement of at-grade intersection with signal optimization	4-lane flyover along New Bagamoyo Road	4-lane flyover along New Bagamoyo Road and 4-lane underpass along Sam Nujoma - Coca-Cola Road	4-lane flyover along New Bagamoyo Road and 6-lane flyover along Sam Nujoma - Coca-Cola Road
LOS	F	F	E	E
Delay (sec/veh)	2,263	273	57	57
Traffic Improvement	Weak	Good	Excellent	Excellent
Evaluation			Recommended	

Source: TANROADS. 2019. Draft Final Design Report, Eight Critical Intersections





However, TANROADS did not approve the underpass tunnel construction and project implementation due to the extensive land acquisition it would have required. Consequently, a revised study was conducted in 2023, which considered the following alternatives:

- “Alternative R-1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative R-2: Construction of a three-lane flyover in each direction along New Bagamoyo Road, with traffic signal optimization.”
- “Alternative R-3: Construction of a two-lane flyover in each direction on New Bagamoyo Road (Level 1) and a two-lane flyover in each direction on Sam Nujoma – Coca-Cola Road (Level 2), with traffic signal optimization.”
- “Alternative R-4: Construction of a two-lane flyover in each direction along New Bagamoyo Road, with traffic signal optimization.”

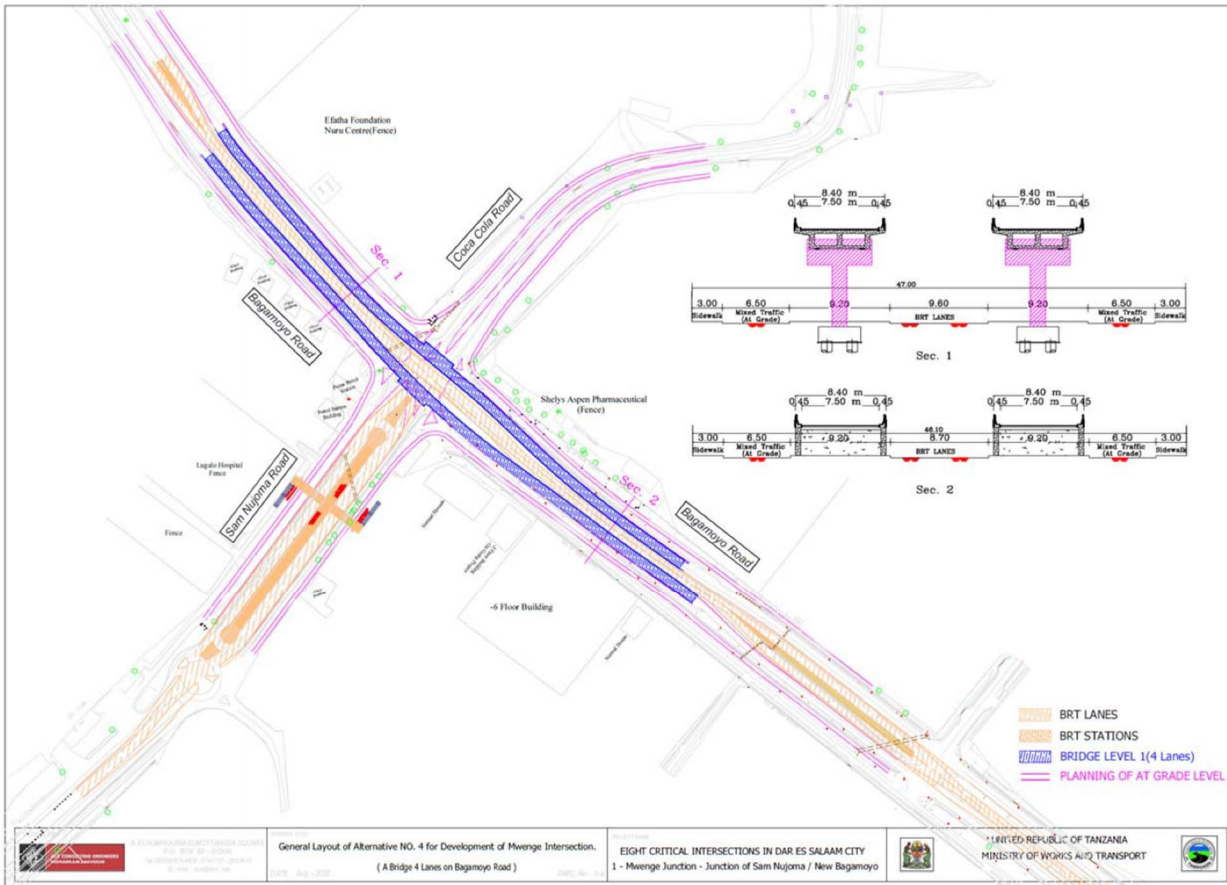
The revised alternatives were evaluated based on the criteria outlined in Table 3.1.3. Among the four, Alternative R-4 was recommended as the most practical option, primarily due to the challenges associated with land acquisition and building resettlement. From a traffic performance perspective, Alternative R-4 demonstrates substantial improvement, with a projected delay reduction of over 69%. The evaluation considered the following factors:

- “Expected effectiveness of the proposed improvements (e.g. reduction in traffic delays, traffic conflict, number of signal phases, and increased level of service (LOS) and safety);”
- “Construction costs of the grade separation structures;”
- “Land acquisition requirements and the extent of building demolition (if any).”

Table 3.1.3 Comparison of Alternative Options for Mwenge Intersection (TANROADS’ Study 2023)

	Alternative R-1	Alternative R-2	Alternative R-3	Alternative R-4
Schematic Image				
Description	Improvement of at-grade intersection with signal optimization	6-lane flyover along New Bagamoyo Road	4-lane flyover along New Bagamoyo Road and 4-lane flyover along Sam Nujoma Road and Coca-Cola Road	4-lane flyover along New Bagamoyo Road
LOS	F	F/C	F/F	F/F
Delay (sec/veh)	5,116	1,710	1,203	1,710
Improvement Ratio	8.5%	69.4%	78.5%	69.4%
Construction Cost	USD 0	USD 12.75 million	USD 33.1 million	USD 9.2 million
Land Acquisition	0 m ²	1,000 m ²	1,750 m ²	150 m ²
Resettlement	0	0	0	0
Evaluation				Recommended

Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections



Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections

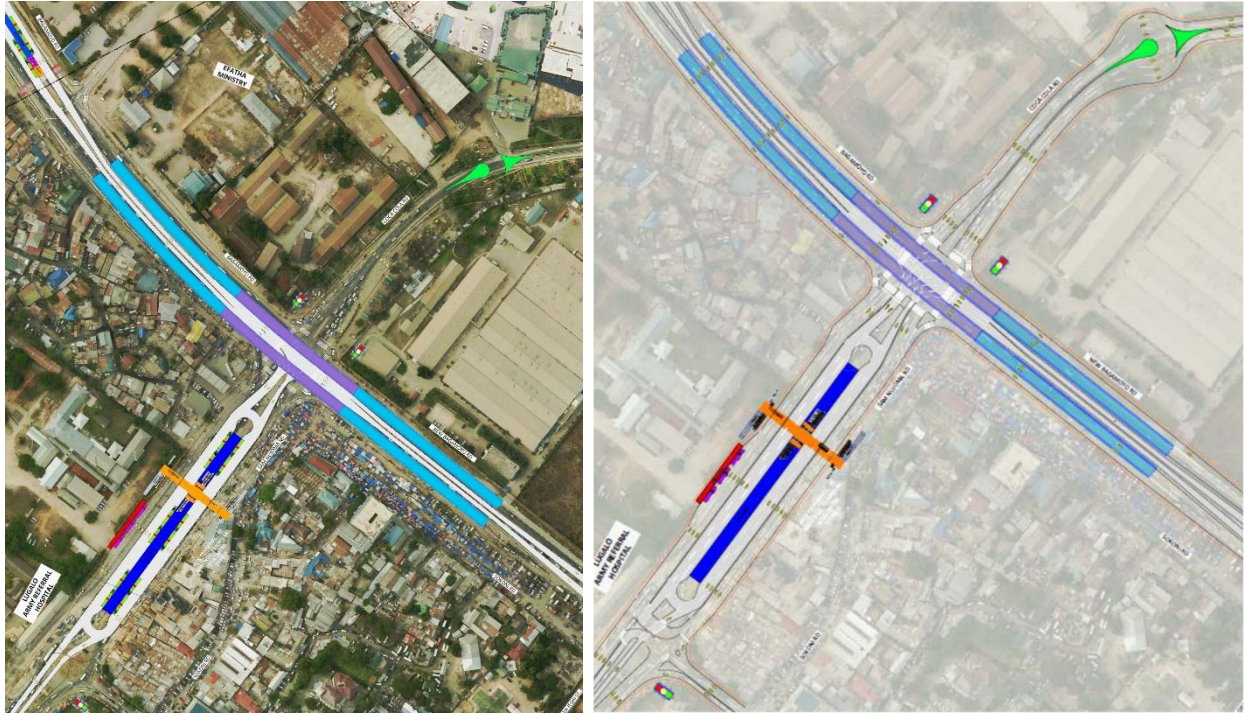
Figure 3.1.16 Recommended Grade Separation for Mwenje Intersection (TANROADS’ Study 2023)

TANROADS identified the following design issues associated with the recommended option (Alternative R-4):

- “The horizontal alignment of the proposed flyovers includes several reverse curves, resulting in a “snake-like” configuration. It is therefore necessary to smoothen the horizontal alignment to improve navigability and aesthetic coherence.”
- “Piers are located at the center of the intersection, which may obstruct vehicular manoeuvrability and pose a collision risk. The bridge span at this location is only 28 meters. To mitigate these concerns, the central piers should be removed, and the superstructure must be redesigned accordingly.”

(4) Recommendation from DART Study

As part of the conceptual design for the BRT corridor, DART conducted a traffic analysis and proposed grade separations at critical intersections. The study recommended the construction of a flyover at Mwenge Intersection along New Bagamoyo Road, positioned between the two proposed BRT stations, as shown in Figure 3.1.17.



Source: DART. 2019. Conceptual Design for BRT Phase 4

Figure 3.1.17 DART's Recommendation for Grade Separation of Mwenge Intersection

(5) Current Land Use

The land use surrounding Mwenge Intersection is shown in Figure 3.1.18. The areas highlighted in blue indicate government-owned land, which is used for a bus terminal, educational institutions, and military facilities. The remaining areas are privately owned and are primarily occupied by shops and factories. Notably, the Wamachinga Market is located within the right-of-way (ROW) of Coca-Cola Road. This market was established by the Kinondoni Municipal Council (KMC) as a temporary relocation site for shops displaced by the construction of the bus terminal. KMC plans to provide a permanent relocation site for these shops in the future.



Source: JICA Survey Team

Figure 3.1.18 Land Use around Mwenge Intersection

(6) Public Utilities

The public utilities within the vicinity of Mwenge Intersection were identified in the presence of representatives from the relevant utility companies and agencies. These utilities are shown in Figure 3.1.19 and Figure 3.1.20.

Several overhead utilities are located in the area, including electric cables provided TANESCO, telecommunication lines from Liquid Intelligent Technologies, and internet cables from SimbaNET and MWANANCHI Group.

Underground utilities include water supply and sewerage pipes installed by DAWASA, telecommunication cables from VODACOM, AIRTEL, and ZANTEL, and a gas pipeline managed by the Tanzania Petroleum Development Corporation (TPDC).

Table 3.1.4 Public Utilities in Mwenge Intersection

Public Utilities	Location	Agency	Description
Electric pole/cable	Overhead	TANESCO	Electric poles and overhead cables are installed on both sides of each road, and high voltage lines are installed along the CBD side of New Bagamoyo Road/ Sam Nujoma Road.
Telecommunication, Fiber cable	Overhead Underground	TTCL, VODACOM, CTV, CATS NET, Liquid Intelligent Technologies, SimbaNET, MWANANCHI GROUP, AIRTEL, ZANTEL	Fiber poles and overhead cables are installed on both sides of each road. Telecommunication companies (VODACOM, AIRTEL, and ZANTEL) install underground pipes in New Bagamoyo Road.
Water	Underground	DAWASA	54-inch water pipe is installed from Sam Nujoma Road towards the CBD side of New Bagamoyo Road. Additionally, 6-12 inch pipes are installed on both sides of the road.
Sewer	Underground	DAWASA	Sewer pipes are installed from Sam Nujoma Road towards the CBD side of New Bagamoyo Road.
Gas	Underground	TPDC	12-inch pipes are installed on Sam Nujoma Road, Coca-Cola Road and the Tegeta side of New Bagamoyo Road.

Note: TANESCO (Tanzania Electric Supply Company)
DAWASA (Dar es Salaam Water and Sewerage Authority)
TTCL (Tanzania Telecommunications Company Ltd)
TPDC (Tanzania Petroleum Development Corporation)

Source: JICA Survey Team



Source: JICA Survey Team

Figure 3.1.19 Public Utilities in Mwenge Intersection (Underground)



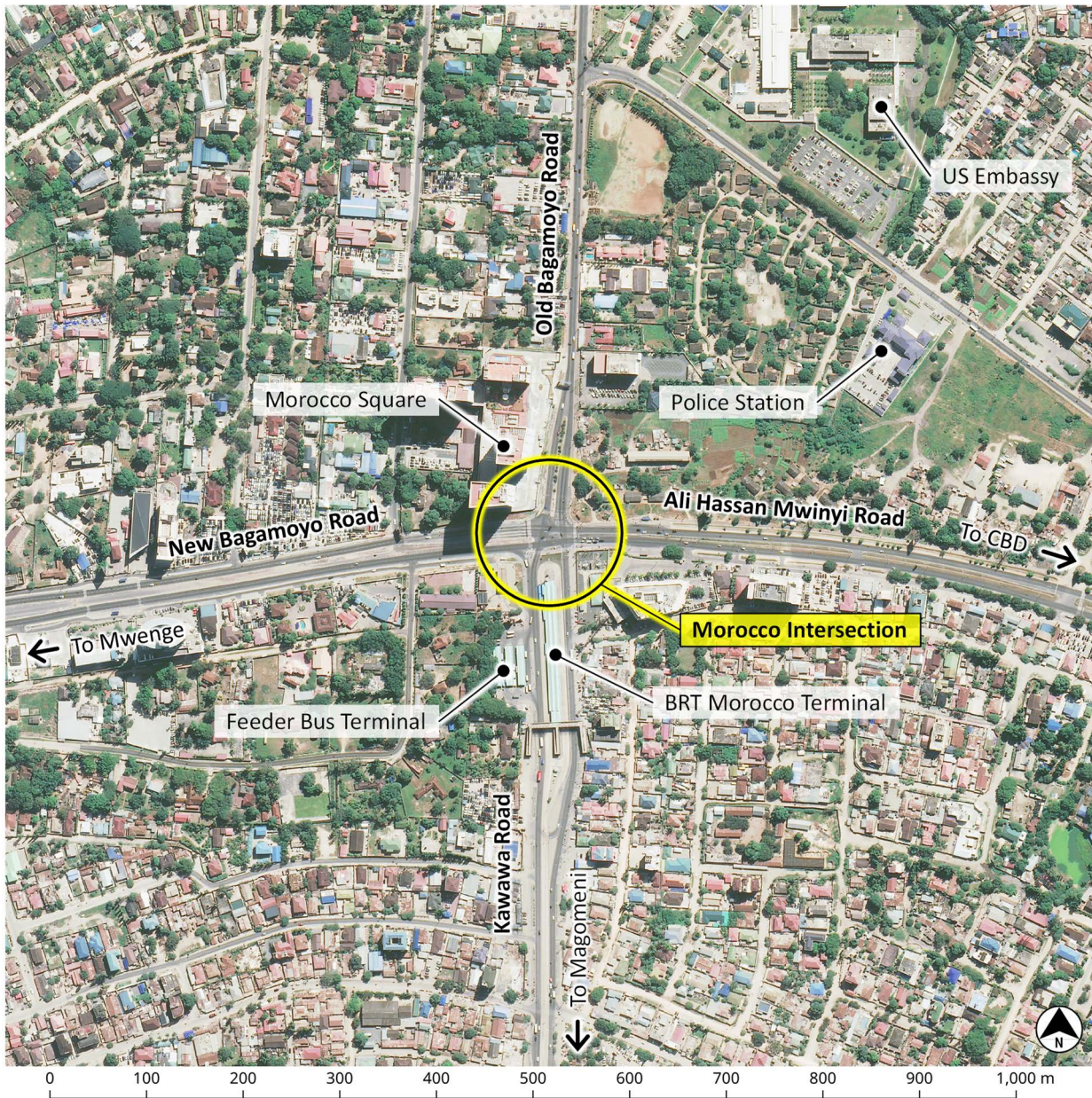
Source: JICA Survey Team

Figure 3.1.20 Public Utilities in Mwenge Intersection (Overhead)

3.2 Morocco Intersection

(1) Current Road Conditions

Morocco Intersection is a signalized four-leg intersection that connects New Bagamoyo Road, Ali Hassan Mwinyi Road, Kawawa Road, and Old Bagamoyo Road. Both New Bagamoyo Road and Ali Hassan Mwinyi Road are four-lane radial-directional roads linking the city center to Bagamoyo. Kawawa Road is a four-lane ring road that connects Morocco to Magomeni and Chang’ombe and also accommodates the BRT Phase 1 corridor. Old Bagamoyo Road functions as a subsidiary of New Bagamoyo Road and reconnects with it at Mbezi.



Source: JICA Survey Team

Figure 3.2.1 Satellite Imagery of Morocco Intersection

New Bagamoyo Road

The section of New Bagamoyo Road from Morocco to Mwenge was widened from two to four-lanes through Japan’s Grant Aid projects, implemented between 2018 and 2021. At the approach to the intersection, the road has a ROW width of approximately 40 to 50 meters. As shown in Figure 3.2.3, the approaching section includes one (1) left-turning lane extending 30 meters, two (2) through lanes, and two (2) right-turning lanes extending 70 meters. In the outbound direction, two (2) lanes are provided. The median is relatively wide, ranging from approximately 6.0 to 9.0 meters. A service road runs along the southern side of the main carriageway, and underground drainage ditches have been constructed along the route.



Approach Section of Intersection



Outbound Lanes



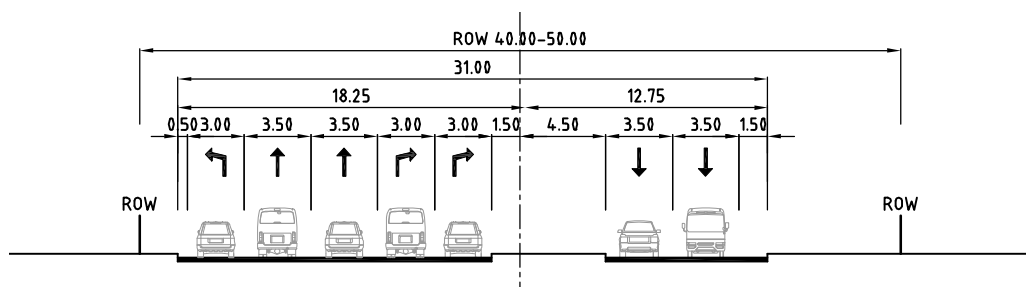
Outbound Lanes



Center Median for BRT corridor

Source: JICA Survey Team

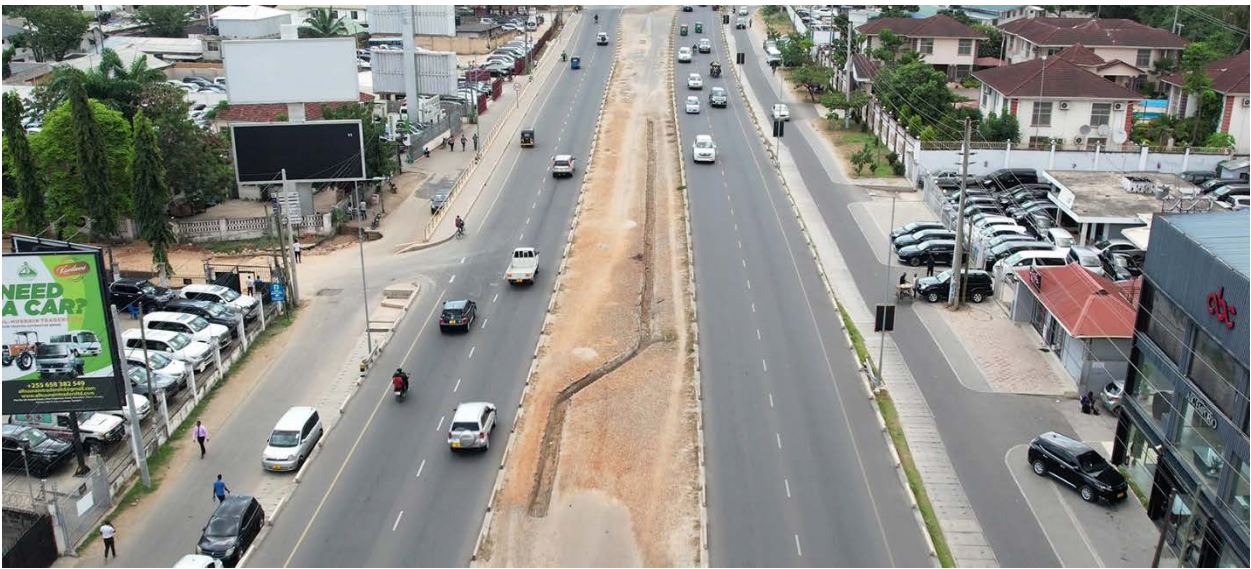
Figure 3.2.2 Current Conditions of New Bagamoyo Road at Morocco



Source: JICA Survey Team

Figure 3.2.3 Current Road Cross Section of New Bagamoyo Road at Morocco

3. Current Conditions at the Identified Intersections



Source: JICA Survey Team

Figure 3.2.4 Aerial Photography of New Bagamoyo Road at Morocco

Ali Hassan Mwinyi Road

Ali Hassan Mwinyi Road is a four-lane road with a ROW width of approximately 45 to 50 m at the approach to the intersection. As shown in Figure 3.2.6, the approaching direction consists of one (1) shared lane for left-turning and through traffic, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. The median varies significantly, ranging from approximately 0.5 to 8.0 meters. Service roads each 3.5 meters wide are located on both sides of the main carriageway and accommodate bidirectional traffic.



Approach Section of Intersection



Outbound Lanes



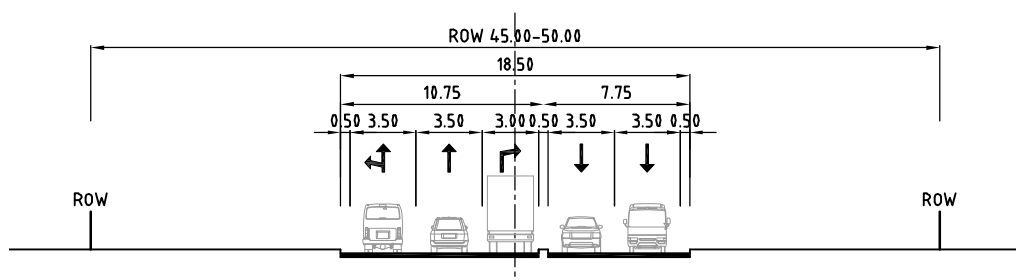
Daladala Bus Stop



Outbound Lanes

Source: JICA Survey Team

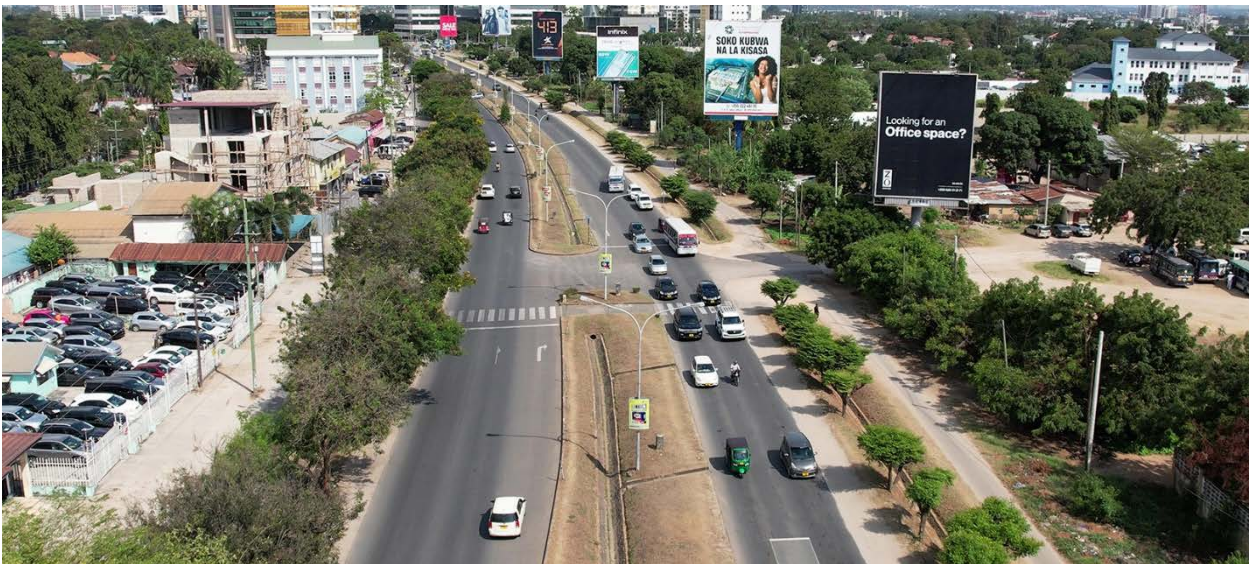
Figure 3.2.5 Current Conditions of Ali Hassan Mwinyi Road at Morocco



Source: JICA Survey Team

Figure 3.2.6 Current Road Cross Section of Ali Hassan Mwinyi Road at Morocco

3. Current Conditions at the Identified Intersections



Source: JICA Survey Team

Figure 3.2.7 Aerial Photography of Ali Hassan Mwinyi Road at Morocco

Kawawa Road

Kawawa Road was widened from two to four-lanes through Japan’s Grant Aid projects implemented between 1998 and 2000. In 2016, dedicated bus lanes were constructed in the center median as part of the BRT Phase 1 corridor.

A BRT terminal station and a feeder terminal for daladala buses are located near the Morocco Intersection. Morocco Station functions as a terminal for the BRT system and includes a U-turn lane for BRT buses positioned close to the intersection.

As shown in Figure 3.2.9, the ROW accommodates one (1) left-turning lane, one (1) through lane, and one (1) shared lane for right-turning and through traffic in approaching direction. In the outbound direction, two (2) lanes are provided.



Approaching Section of Intersection



Outbound Lanes



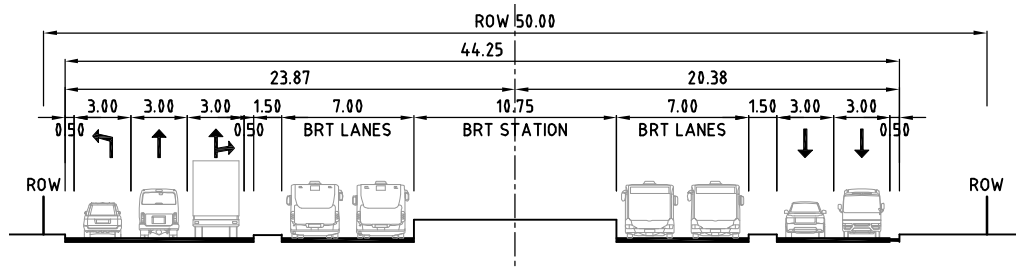
Outbound Lanes



Approaching Lanes

Source: JICA Survey Team

Figure 3.2.8 Current Conditions of Kawawa Road at Morocco



Source: JICA Survey Team

Figure 3.2.9 Current Road Cross Section of Kawawa Road at Morocco

3. Current Conditions at the Identified Intersections



Pedestrian Bridge for Accessing BRT Station



Feeder Bus Terminal for Daladalas



BRT terminal station

Source: JICA Survey Team

Figure 3.2.10 Aerial Photography of Kawawa Road at Morocco

Old Bagamoyo Road (Mwai Kibaki Road)

Old Bagamoyo Road—also referred to as Mwai Kibaki Road—is a two-lane road running parallel to New Bagamoyo Road. As shown in Figure 3.2.12, the ROW in the approaching direction includes one (1) shared lane for left-turning and through traffic, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. At the corner of the intersection stands a mixed-use development called Morocco Square. The complex includes two (2) office towers, one (1) residential tower, a commercial space, and one (1) hotel tower.



Approaching Direction



Outbound Lanes



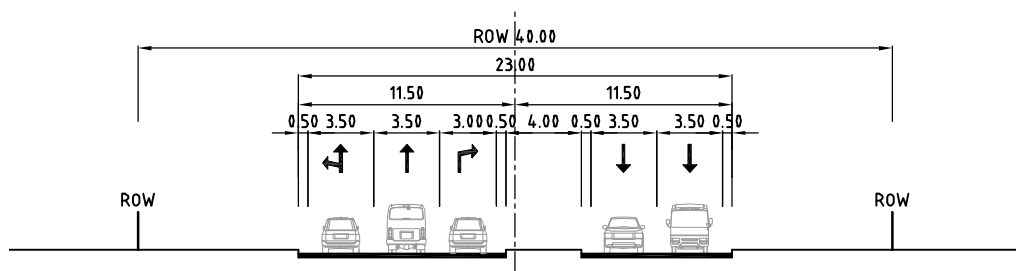
2-Lane Road Section



Overview from Morocco Square

Source: JICA Survey Team

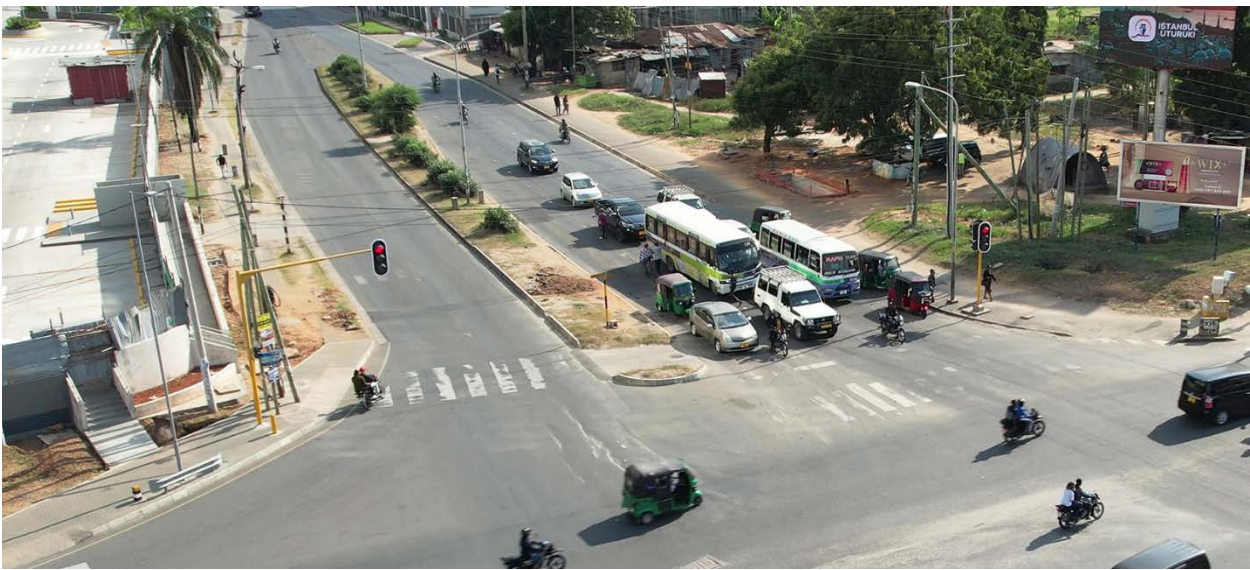
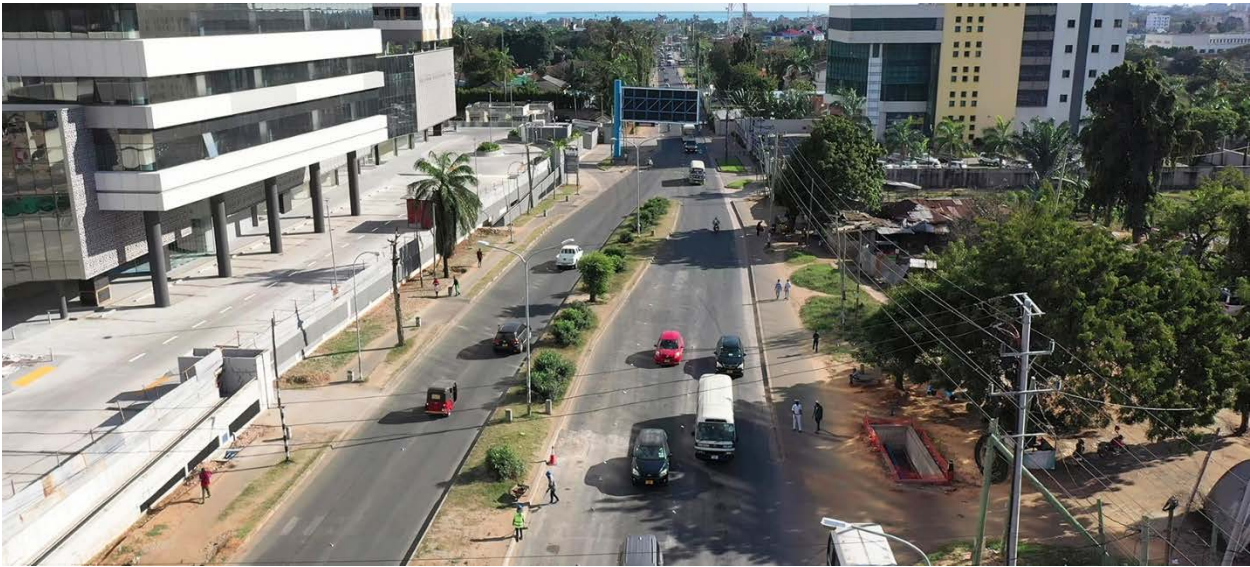
Figure 3.2.11 Current Conditions of Old Bagamoyo Road at Morocco



Source: JICA Survey Team

Figure 3.2.12 Current Road Cross Section of Old Bagamoyo Road at Morocco

3. Current Conditions at the Identified Intersections



Source: JICA Survey Team

Figure 3.2.13 Aerial Photography of Old Bagamoyo Road at Morocco

(2) BRT Plan

Morocco Intersection is included in the BRT Phase 4 corridor. Two (2) BRT stations are proposed in its vicinity as follows:

- “Makochi Station (New Bagamoyo Road)”
- “Morocco Station (Ali Hassan Mwinyi Road)”



Source: JICA Survey Team

Figure 3.2.14 BRT Plan at Morocco Intersection

According to DART’s operations plan, the expected operation of the above BRT stations is summarized in Table 3.2.1.

Table 3.2.1 BRT Phase 4 Bus Routes and Stations near Morocco Intersection

Service	Section	Max Passenger	Peak Hourly Frequency	Headway (min)	Fleet	Makochi Station	Morocco Station
BR402	Tegeta-Morocco	980	8	7.50	14	✓	✓
BR405	SalaSala-Ubungo	2,500	20	3.00	26	-	-
BR404	Mbezi Beach-Gerezani	3,360	27	2.25	47	✓	-
BR401	Mwenge-Kivukoni	2,600	20	3.00	24	✓	✓
BR406	Ubungo-Morocco	2,910	24	2.50	22	✓	✓
BR4X3	Tegeta-Gerezani (Express)	4,820	40	1.50	81	✓	-
BR4X5	Tegeta-Ubungo (Express)	4,780	40	1.50	56	-	-

Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision

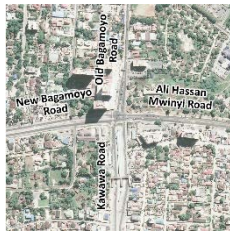

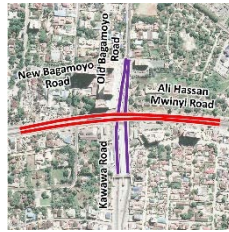

(3) Recommendation from TANROADS Study

In 2019, TANROADS submitted a study report that evaluated the following grade separation alternatives for Morocco Intersection:

- “Alternative 1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative 2: Construction of a three-lane flyover in each direction along New Bagamoyo - Ali Hassan Mwinyi Road, with traffic signal optimization.”
- “Alternative 3: Construction of a three-lane flyover in each direction along New Bagamoyo - Ali Hassan Mwinyi Road, and a two-lane underpass in each direction along Kawawa - Old Bagamoyo Road, with traffic signal optimization.”
- “Alternative 4: Construction of a three-lane flyover in each direction along New Bagamoyo - Ali Hassan Mwinyi Road, and a two-lane flyover in each direction along Kawawa - Old Bagamoyo Road, with traffic signal optimization.”

Following a comparative analysis, Alternative 3 was recommended as it demonstrated the highest performance in both technical and operational terms.

Table 3.2.2 Comparison of Alternative Options for Morocco Intersection (TANROADS’ Study 2019)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Schematic Image				
Description	Improvement of at-grade intersection with signal optimization	6-lane flyover along New Bagamoyo - Ali Hassan Mwinyi Road	6-lane flyover along New Bagamoyo - Ali Hassan Mwinyi Road and 4-lane underpass along Kawawa - Old Bagamoyo Road	6-lane flyover along New Bagamoyo - Ali Hassan Mwinyi Road and 4-lane flyover along Kawawa - Old Bagamoyo Road
LOS	F	F	C	C
Delay (sec/veh)	3,054	403	33	33
Traffic Improvement	Weak	Good	Good	Good
Evaluation			Recommended	

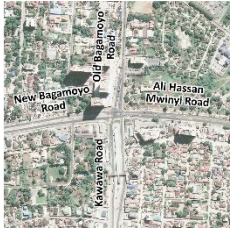

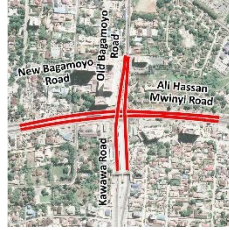
Source: TANROADS. 2019. Draft Final Design Report, Eight Critical Intersections

TANROADS did not approve the underpass tunnel construction or the large-scale land acquisition required for project implementation, prompting a revised study in 2023. The revised study evaluated the following alternatives:

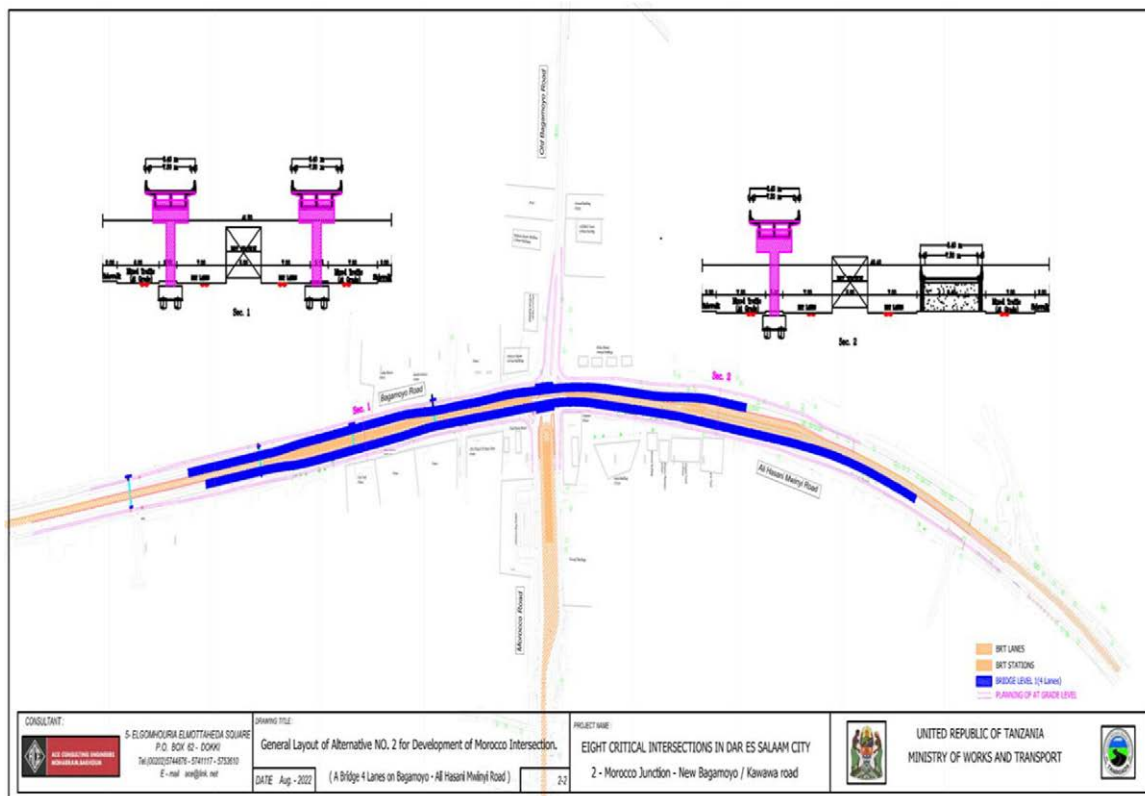
- “Alternative R-1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative R-2: Construction of a two-lane flyover in each direction along New Bagamoyo - Ali Hassan Mwinyi Road, with traffic signal optimization.”
- “Alternative R-3: Construction of a two-lane flyover in each direction along New Bagamoyo - Ali Hassan Mwinyi Road and a two-lane flyover in each direction along Kawawa - Old Bagamoyo Road, with traffic signal optimization.”

Based on the evaluation results summarized in Table 3.2.3, Alternative R-2 was recommended as the most practical option among the three (3) alternatives. This recommendation was largely driven by the challenges of land acquisition and building resettlement. From a traffic operations perspective, Alternative R-2 is expected to yield delay reduction at the intersection, with an evaluated improvement of over 61%.

Table 3.2.3 Comparison of Alternative Options for Morocco Intersection (TANROADS’ Study 2023)

	Alternative R-1	Alternative R-2	Alternative R-3
Schematic Image			
Description	Improvement of at-grade intersection with signal optimization	4-lane flyover along New Bagamoyo - Ali Hassan Mwinyi Road	4-lane flyover along New Bagamoyo - Ali Hassan Mwinyi Road and 4-lane flyover along Kawawa - Old Bagamoyo Road
LOS	F	F/F	F/F
Delay (sec/veh)	4,418	3,941	1,683
Improvement Ratio	56.4%	61.1%	83.4%
Construction Cost	USD 0	USD 27.8 million	USD 44.8 million
Land Acquisition	0 m ²	0 m ²	700 m ²
Resettlement	0	0	0
Evaluation		Recommended	

Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections



Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections

Figure 3.2.15 Recommended Grade Separation for Morocco Intersection (TANROADS’ Study 2023)

TANROADS identified the following concerns with the recommended option (Alternative R-2):

- “The horizontal alignment of the proposed flyovers includes many reverse curves resulting in a “snake-like” appearance. It is therefore necessary to smooth the alignment to improve both functionality and visual coherence.”
- “Piers are located at the center of the intersection, which may hinder vehicular manoeuvrability and increase the risk of collisions. The bridge span at this location is only 31 meters. To address these issues, the central piers should be removed and the superstructure adjusted accordingly.”
- “The 1.5 kilometre-long Morocco flyover is considered economically inefficient. Additionally, the vertical alignment contains several undulations, detracting from its aesthetic appeal.”

(4) Recommendation from DART Study

The DART study recommended the construction of a flyover at Morocco Intersection along New Bagamoyo Road and Ali Hassan Mwinyi Road, positioned between the two proposed BRT stations, as shown in Figure 3.2.16.



Source: DART. 2019. Conceptual Design for BRT Phase 4

Figure 3.2.16 DART’s Recommendation for Grade Separation of Morocco Intersection

(5) Current Land Use

The land use surrounding the Morocco Intersection is shown in Figure 3.2.17. The government-owned land, highlighted in blue, is allocated to the Tanzania Electric Supply Company (TANESCO), the police, and the National Housing Corporation (NHC). NHC is currently developing a mixed-use complex known as "Morocco Square," consisting of two buildings. Privately owned land is mainly used for shops and business offices.



Source: JICA Survey Team

Figure 3.2.17 Land Use around Morocco Intersection

(6) Public Utilities

The public utilities within the project area were identified in the presence of representatives from the relevant utility agencies. The utilities are shown in Figure 3.2.18 and Figure 3.2.19. Several overhead utilities are present in the area, including electricity lines provided by TANESCO, Telecommunications infrastructure from Liquid Intelligent Technologies, and internet and media services from SimbaNET and MWANANCHI Group respectively. Underground installations include water supply and sewerage pipes managed by DAWASA, as well as underground conduits operated by TANESCO.

Table 3.2.4 Public Utilities in Mwenge Intersection

Public Utilities	Location	Agency	Description
Electric pole/cable	Overhead Underground	TANESCO	Electric poles and overhead cables are installed on both sides of each road. Additionally underground pipes are installed on both sides of New Bagamoyo Road/ Sam Nujoma Road.
Telecommunication, Fiber cable	Overhead Underground	TTCL, VODACOM, CTV, CATS NET, LIQUID TELECOM, Simba net, MWANANCHI GROUP, AIRTEL, ZANTEL	Fiber poles and overhead cables are installed on both sides of each road. Telecommunication companies (TTCL, Liquid Telecom, VODACOM) a install underground pipes in New Bagamoyo Road.
Water	Underground	DAWASA	54-inch water pipe is installed on Tegeta side of New Bagamoyo Road. On the CBD side, a 54-inch pipe branches to 8-28-inch pipe.
Sewer	Underground	DAWASA	Sewer pipes are installed from Sam Nujoma Road towards the CBD side of New Bagamoyo Road.

Note: TANESCO (Tanzania Electric Supply Company)
 DAWASA (Dar es Salaam Water and Sewerage Authority)
 TTCL (Tanzania Telecommunications Company Ltd)
 TPDC (Tanzania Petroleum Development Corporation)

Source: JICA Survey Team



Figure 3.2.18 Public Utilities in Morocco Intersection (Underground)

Source: JICA Survey Team



Source: JICA Survey Team

Figure 3.2.19 Public Utilities in Morocco Intersection (Overhead)

3.3 Buguruni Intersection

(1) Current Road Conditions

Buguruni Intersection is a signalized four-leg intersection connecting Nelson Mandela Road, Uhuru Street (a subsidiary road of Nyerere Road), and Mnyamani Road. An at-grade railway crossing and another major intersection—the TAZARA Intersection—are located nearby. Additionally, relatively large daladala bus stops are situated between the two intersections, serving as significant nodes for local public transport.



Source: JICA Survey Team

Figure 3.3.1 Satellite Imagery of Buguruni Intersection

Nelson Mandela Road (Ubungo Side)

On the Ubungo side of Buguruni Intersection, Nelson Mandela Road has a ROW width of approximately 50 meters at the approach. As shown in Figure 3.3.3, the approaching direction consists of one (1) shared lane for left-turning and through traffic, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. The median is approximately 2.0 meters wide. Service roads run along both sides of the main carriageway, and a trapezoidal open drainage ditch is located between the main roadway and the service roads.

A pedestrian bridge is located approximately 125 meters from the intersection, a daladala bus stop is positioned about 150 meters away in the outbound direction. The disorderly operation of the daladala buses during passenger loading and unloading often causes traffic congestion near the bus stops, especially during peak hours.



Approach Section of Intersection



Daladala Bus Stop



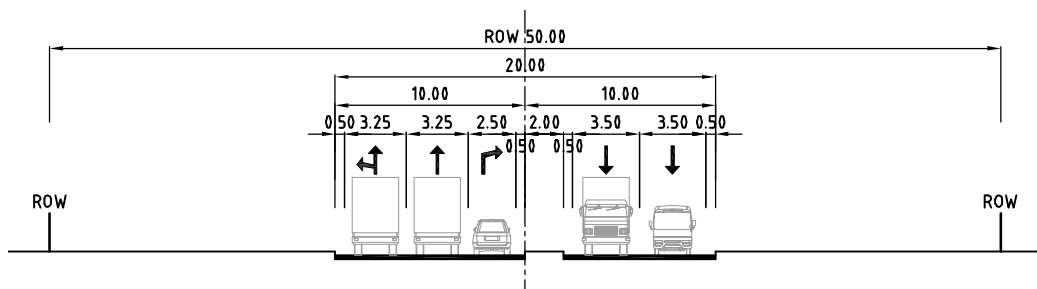
Approaching Lanes



Outbound Lanes

Source: JICA Survey Team

Figure 3.3.2 Current Conditions of Nelson Mandela Road at Buguruni (Ubungo Side)



Source: JICA Survey Team

Figure 3.3.3 Current Road Cross Section of Nelson Mandela Road at Buguruni (Ubungo Side)

3. Current Conditions at the Identified Intersections



Buguruni Intersection



Pedestrian Bridge and Daladala Bus Bay



Source: JICA Survey Team

Figure 3.3.4 Aerial Photography of Nelson Mandela Road at Buguruni (Ubungo Side)

Nelson Mandela Road (TAZARA Side)

On the TAZARA side of Buguruni Intersection, Nelson Mandela Road has a ROW width of approximately 50 meters at the approach. As indicated in Figure 3.3.6, the approaching direction consists of one (1) shared lane for left-turning and through traffic, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided. The median is approximately 2.0 meters wide. Service roads are present on both sides of the main carriageway, and a trapezoidal open drainage ditch is situated between the main roadway and the service roads.

A daladala bus stop is located approximately 40 meters from the intersection in the outbound direction. The disorderly operation of daladala buses during passenger loading and unloading frequently causes traffic congestion in the area—not only during peak hours but also during off-peak hours.



Approaching Section of Intersection



Daladala Bus Stop



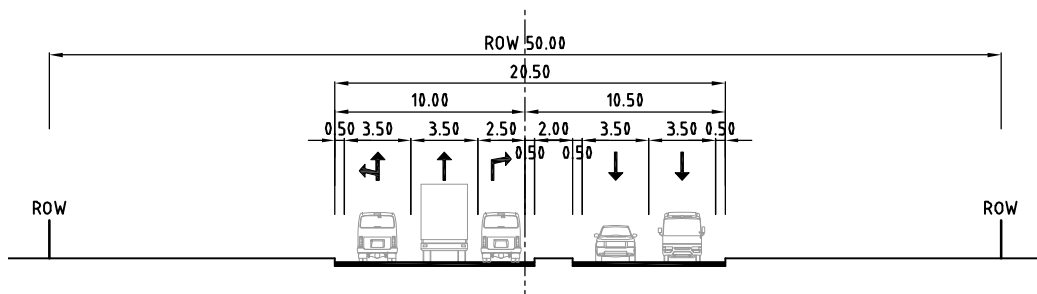
Outbound Lanes



Approaching Lanes

Source: JICA Survey Team

Figure 3.3.5 Current Conditions of Nelson Mandela Road at Buguruni (TAZARA Side)



Source: JICA Survey Team

Figure 3.3.6 Current Road Cross Section of Nelson Mandela Road at Buguruni (TAZARA Side)

3. Current Conditions at the Identified Intersections



Source: JICA Survey Team

Figure 3.3.7 Aerial Photography of Nelson Mandela Road at Buguruni (TAZARA Side)

Uhuru Street

Uhuru Street is a subsidiary of Nyerere Road that links Buguruni, Kariakoo, and the CBD. The first 1.1 kilometre section from Buguruni Intersection comprises four lanes and has a ROW width of approximately 35 meters, while the remaining section transitions to two lanes with a ROW width of about 15 meters. As shown in Figure 3.3.9, the approaching direction includes one (1) left-turning lane, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided.



Buguruni Intersection



Uhuru Street



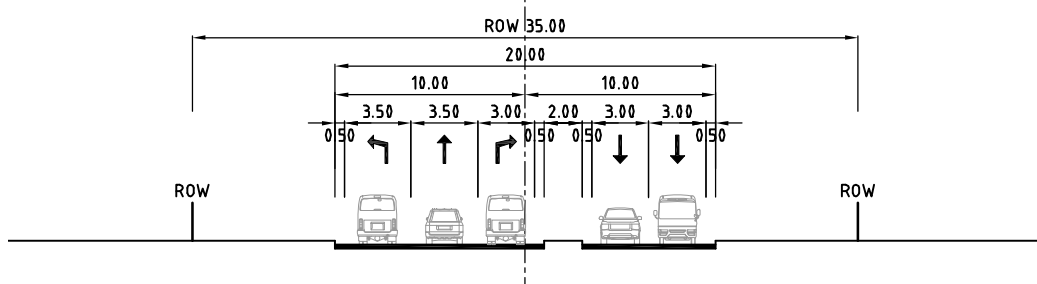
Outbound Lanes



Approaching Lanes

Source: JICA Survey Team

Figure 3.3.8 Current Conditions of Uhuru Street at Buguruni



Source: JICA Survey Team

Figure 3.3.9 Current Road Cross Section of Uhuru Street at Buguruni

3. Current Conditions at the Identified Intersections



Source: JICA Survey Team

Figure 3.3.10 Aerial Photography of Uhuru Street at Buguruni

Mnyamani Road

Mnyamani Road is a two-lane road that passes through the densely populated residential area of Vingunguti. The road is particularly narrow, with a width of approximately 7 meters.



Buguruni Intersection



Approach Section 1



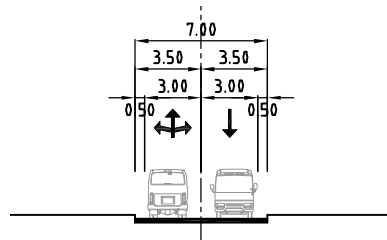
Approach Section 2



Approach Section 3

Source: JICA Survey Team

Figure 3.3.11 Current Conditions of Mnyamani Road at Buguruni



Source: JICA Survey Team

Figure 3.3.12 Current Road Cross Section of Mnyamani Road at Buguruni

3. Current Conditions at the Identified Intersections



Buguruni Intersection



Parallel Section with Nelson Mandela Road



Source: JICA Survey Team

Figure 3.3.13 Aerial Photography of Mnyamani Road at Buguruni

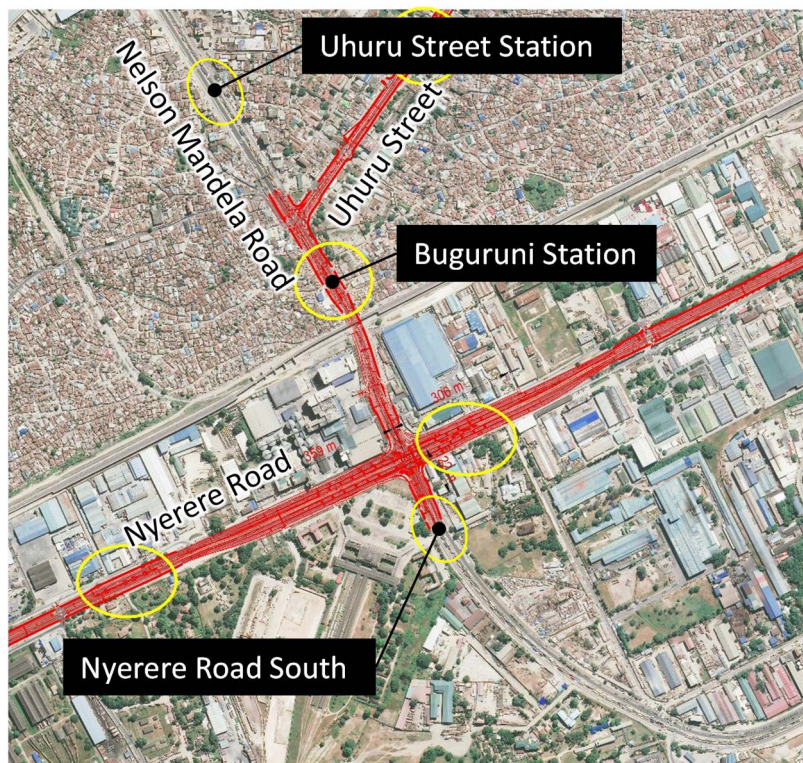
(2) BRT Plan

Buguruni Intersection is part of both the BRT Phase 3 and Phase 5 corridors. The BRT Phase 3 project begins in the Posta area of the CBD and follows Azikiwe and Maktaba Streets (0.95 kilometres), Bibi-Titi Street and Nyerere Road—passing Julius Nyerere International Airport (JNIA)—to the Gongo la Mboti Bus Terminal (17.92 kilometres). It also includes a branch from Kariakoo BRT Terminal along Uhuru Street to Buguruni and Nelson Mandela Road, connecting with Nyerere Road at the TAZARA junction (4.46 kilometres).

The BRT Phase 5 Project consists of two trunk corridors with a total length of 25.6 kilometres: one along Nelson Mandela and Mabagala Roads (16.5 km) and another along Tabata – Kigogo Road (9.9 kilometres).

In the vicinity of the Buguruni Intersection, three (3) BRT stations are proposed:

- “Uhuru Street Station (Nelson Mandela Road), to be constructed under Phase 5”
- “Buguruni Station (Nelson Mandela Road), to be constructed under Phase 3”
- “Nyerere Road South Station (Nelson Mandela Road) to be constructed under Phase 5”



Source: JICA Survey Team

Figure 3.3.14 BRT Plan at Buguruni Intersection

According to DART’s operations plan, the expected operation of the above BRT stations is summarized in Table 3.3.1.

Table 3.3.1 BRT Phase 3 & 5 Stations

Service	Section	Max Passenger	Peak Hourly Frequency	Headway (min)	Fleet	Uhuru Street Station	Buguruni Station	Nyerere Road South Station
BR301	Gongolamboto-Kivukoni	2,730	24	2.50	47	-	-	-
BR302	Mnazi Mmoja-Ukongga	3,550	27	2.25	36	-	✓	-
BR305	Airport-Kivukoni	3,340	27	2.25	41	-	✓	-
BR306	Buguruni-Kivukoni	2,580	20	3.00	21	-	✓	-
BR3Y1	Gongolamboto-Kivukoni (Ex)	3,600	27	2.25	50	-	-	-
BR3X1	Gerezani-Ukongga (Ex)	2,730	24	2.50	23	-	-	-
BR3X7	Gongolamboto-Ilala (Ex)	2,870	24	2.50	42	-	-	-
BR501	Ubungo-Bridge	1,440	11	5.50	15	✓	✓	✓
BR502	Mtoni-Mwenge	2,580	20	3.00	34	✓	✓	✓
BR506	Tabata Segerea-Gerezani	1,720	14	4.50	19	✓	-	-
BR507	Tabata Segerea-Temeke	2,150	18	3.50	24	✓	✓	✓
BR509	Tabata Segerea-Ilala	1,780	14	4.50	17	-	-	-
BR508	Kigogo-Oysterbay	3,210	24	2.50	32	-	-	-
BR517	Mnazi Mmoja-Temeke	3,040	24	2.50	25	-	✓	✓
BR5X2	Ubungo-Mtoni (Ex)	4,010	30	2.00	37	-	✓	-
BR5X0	Ukongga-Mwenge (Ex)	3,120	24	2.50	34	-	-	-
BR5Y6	Tabata Segerea-Kivukoni (Ex)	3,160	24	2.50	43	✓	-	-

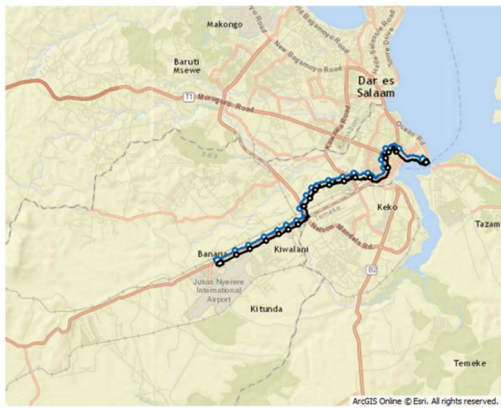
Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision



BR301: Gongolamboto-Kivukoni



BR302: Mnazi Mjooja-Ukongu



BR305: Airport-Kivukoni



BR306: Buguruni-Kivukoni



BR3Y1: Gongolamboto-Kivukoni (Ex)



BR3X1: Gerezani-Ukongu (Ex)



BR3X7: Gongolamboto-Ilala (Ex)

Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision

Figure 3.3.15 Route Maps for BRT Phase 3 (Proposed Trunk Services)

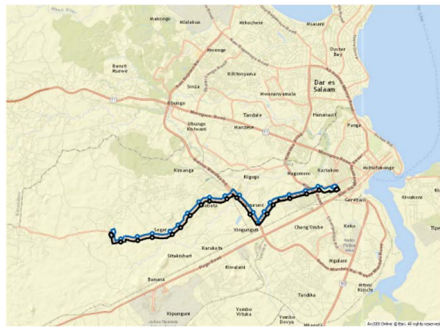
3. Current Conditions at the Identified Intersections



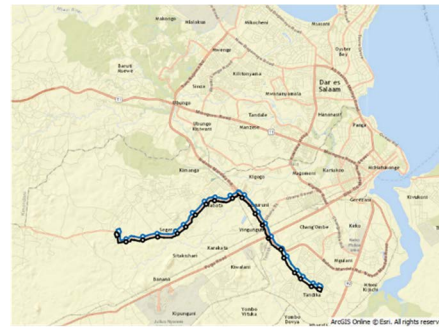
BR501: Ubungo-Bridge



BR502: Mtoni-Mwenge



BR506: Tabata Segerea-Gerezani



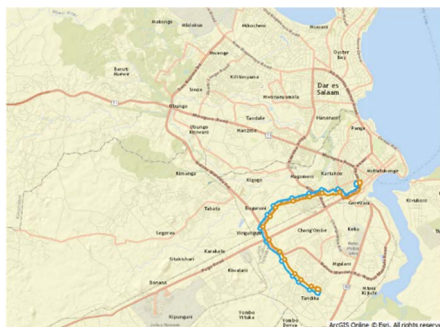
BR507: Tabata Segerea-Temeke



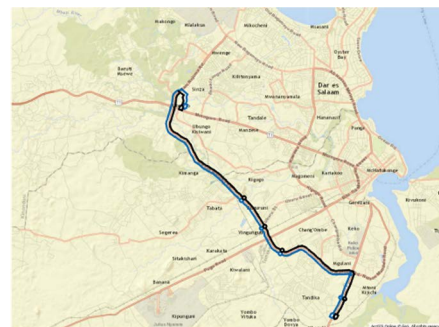
BR509: Tabata Segerea-Ilala



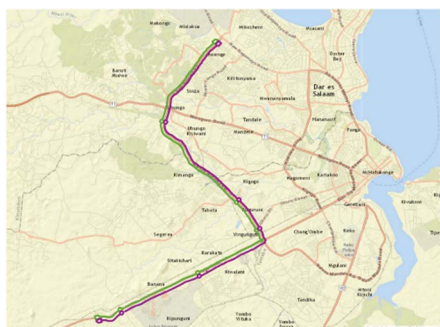
BR508: Kigogo-Oysterbay



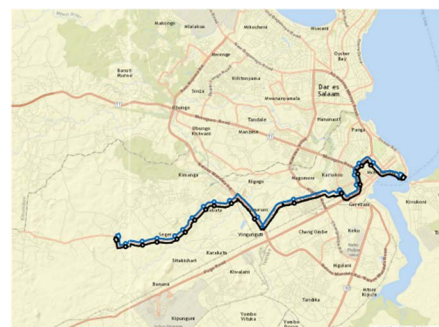
BR517: Mnazi Mmoja-Temeke



BR5X2: Ubungo-Mtoni (Ex)



BR5X0: Ukongwa-Mwenge (Ex)



BR5Y6: Tabata Segerea-Kivukoni (Ex)

Source: DART. 2019. Service Plan and Forecasting Outputs, Travel Demand Forecast Update and Service Plan Revision

Figure 3.3.16 Route Maps for BRT Phase 5 (Proposed Trunk Services)



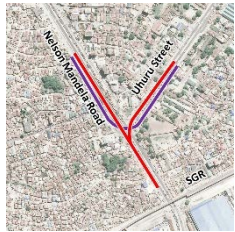

(3) Recommendation from TANROADS Study

In its 2019 study report, TANROADS evaluated the following alternatives for grade separation at Buguruni Intersection:

- “Alternative 1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative 2: Construction of a three-lane flyover in each direction along Nelson Mandela Road, with traffic signal optimization.”
- “Alternative 3: Construction of a three-lane flyover in the northbound direction of Nelson Mandela Road, a two-lane right-turning ramp to Uhuru Street, and a two-lane right-turning underpass from Uhuru Street to Nelson Mandela Road, with traffic signal optimization.”
- “Alternative 4: Construction of a three-lane flyover in the northbound direction of Nelson Mandela Road, a two-lane right-turning ramp to Uhuru Street, and a two-lane right-turning flyover from Uhuru Street to Nelson Mandela Road, with traffic signal optimization.”

Based on the comparative analysis, Alternatives 3 and 4 were recommended, as they offered the best performance in both technical and operational aspects.

Table 3.3.2 Comparison of Alternative Options for Buguruni Intersection (TANROADS’ Study 2019)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Schematic Image				
Description	Improvement of at-grade intersection with signal optimization	6-lane flyover along Nelson Mandela Road	3-lane flyover along Nelson Mandela Road with 2-lane right-turning ramp to Uhuru Street and 2-lane right-turning underpass from Uhuru Street	3-lane flyover along Nelson Mandela Road with 2-lane right-turning ramp to Uhuru Street and 2-lane right-turning flyover from Uhuru Street
LOS	F	F	C	C
Delay (sec/veh)	2,050	1,270	28	28
Traffic Improvement	Weak	Good	Excellent	Excellent
Evaluation			Recommended	

Source: TANROADS. 2019. Draft Final Design Report, Eight Critical Intersections




But TANROADS did not approve the underpass tunnel construction or the associated project implementation due to the requirement for large-scale land acquisition. In response, a revised study conducted in 2023 evaluated the following alternatives:

- “Alternative R-1: Improvement of the at-grade intersection with traffic signal optimization.”
- “Alternative R-2: Construction of a two-lane flyover in each direction along Nelson Mandela Road, with traffic signal optimization.”
- “Alternative R-3: Construction of a two-lane flyover in each direction along Nelson Mandela Road and a two-lane right-turning ramp to Uhuru Street, with traffic signal optimization.”

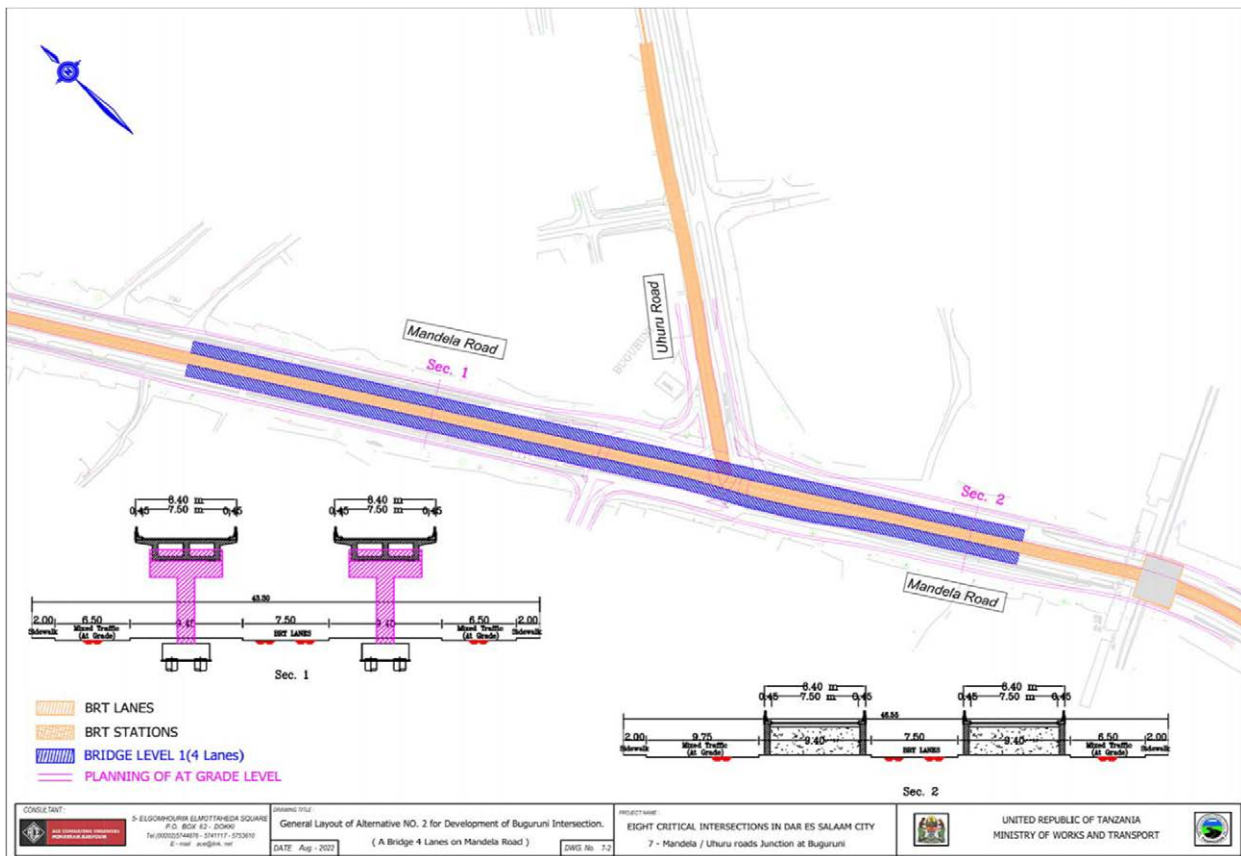
3. Current Conditions at the Identified Intersections

As shown in Table 3.3.3, Alternative R-2 was identified as the most practical option among the three (3) alternatives, primarily due to the challenges associated with land acquisition and the resettlement of buildings. From a traffic operations perspective, Alternative R-2 is expected to result in a substantial reduction in intersection delays, with an evaluated improvement of over 51%.

Table 3.3.3 Comparison of Alternative Options for Buguruni Intersection (TANROADS’ Study 2023)

	Alternative R-1	Alternative R-2	Alternative R-3
Schematic Image			
Description	Improvement of at-grade intersection with signal optimization	4-lane flyover along Nelson Mandela Road	4-lane flyover along Nelson Mandela Road and 2-lane right-turning ramp to Uhuru Street
LOS	F	F/F	F/F
Delay (sec/veh)	6,600	4,760	2,349
Improvement Ratio	33.1%	51.8%	76.2%
Construction Cost	USD 0	USD 14.96 million	USD 20.04 million
Land Acquisition	340 m ²	340 m ²	970 m ²
Resettlement	1	1	7
Evaluation		Recommended	

Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections



Source: TANROADS. 2023. Draft Final Design Report, Eight Critical Intersections

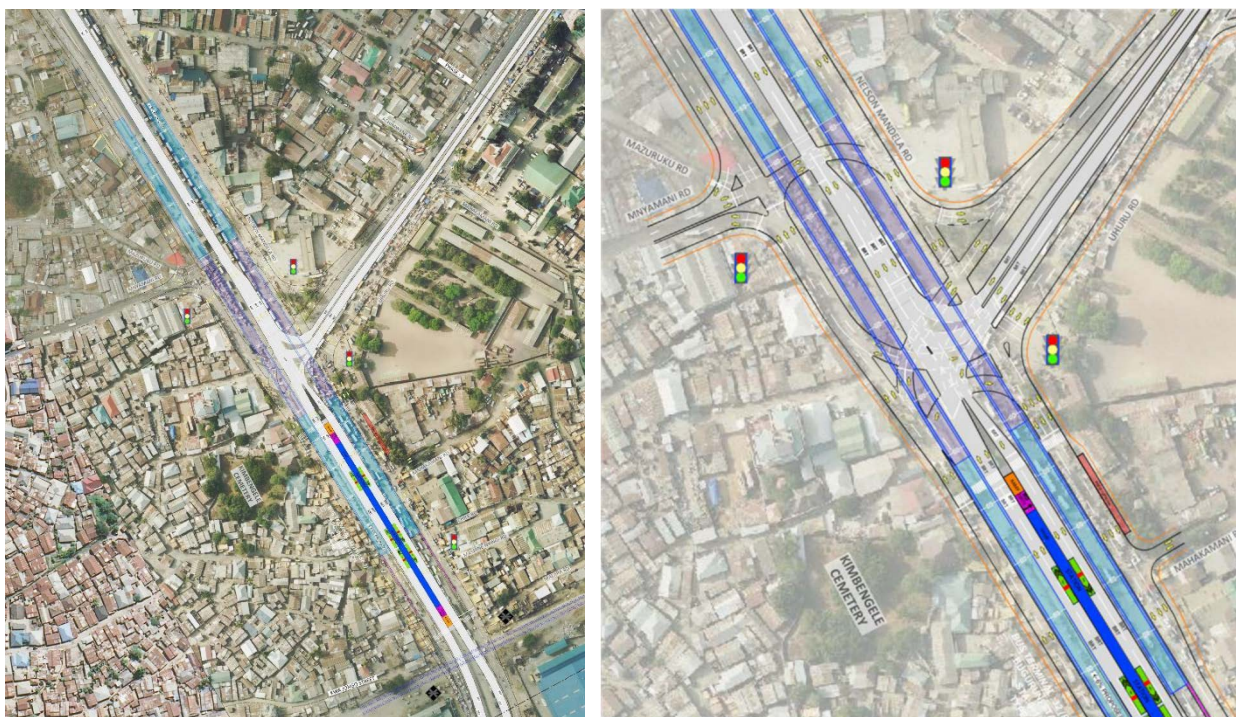
Figure 3.3.17 Recommended Grade Separation for Buguruni Intersection (TANROADS’ Study 2023)

TANROADS has identified the following design concerns with the recommended option (Alternative R-2):

- “The horizontal alignment of the proposed flyovers features several reverse curves resulting in a “snake-like” appearance. It is therefore necessary to smooth the alignment to improve both operational performance and visual coherence.”
- “Piers are located at the centre of the intersection, which may hinder vehicular manoeuvrability and increase the risk of collisions. The bridge span at this location is only 28 meters. To address these issues, the central piers should be removed and the superstructure adjusted accordingly.”

(4) Recommendation from DART Study

The DART study recommended the construction of a flyover at Buguruni Intersection along Nelson Mandela Road, as shown in Figure 3.3.18.



Source: DART. 2019. Conceptual Design for BRT Phase 5

Figure 3.3.18 DART’s Recommendation for Grade Separation of Buguruni Intersection

(5) Current Land Use

The land use surrounding Buguruni Intersection is shown in Figure 3.3.19. No government-owned land exists in the vicinity of the Buguruni intersection. The area is predominantly occupied by privately owned land, which is primarily used for food manufacturing, office space, and transportation-related businesses.



Source: JICA Survey Team

Figure 3.3.19 Land Use around Buguruni Intersection

(6) Public Utilities

Public utilities survey was not conducted at Buguruni Intersection, as it was not selected as a target intersection for the project.

3.4 TAZARA Intersection

(1) Current Road Conditions

TAZARA Intersection is an intersection between Nelson Mandela Road and Nyerere Road, located approximately 600 meters south of Buguruni Intersection. Between 2016 and 2018, a flyover with a total bridge length of 425 m was constructed along Nyerere Road as part of Japan's Grant Aid project.



Source: JICA Survey Team

Figure 3.4.1 Satellite Imagery of Mwenge Intersection

Nelson Mandela Road (Buguruni Side)

On the Buguruni Side of TAZARA Intersection, Nelson Mandela Road has a ROW width of approximately 50 meters. As shown in Figure 3.4.3, the approaching direction includes one (1) left-turning lane, two (2) through lanes, and one (1) right-turning lane. In the outbound direction, three (3) lanes are provided.

The median width of varies from approximately 1.5 to 4.5 meters. A service road is present only on the eastern side of the carriageway. Trapezoidal open drainage ditches are provided along both sides of the road.

A daladala bus stop is located approximately 185 m from the intersection in outbound direction of the lane. Same as the other bus stops, this bus stop is also known as a traffic bottleneck.



Outbound Lanes



SGR Viaduct and at-grade Railway Crossing



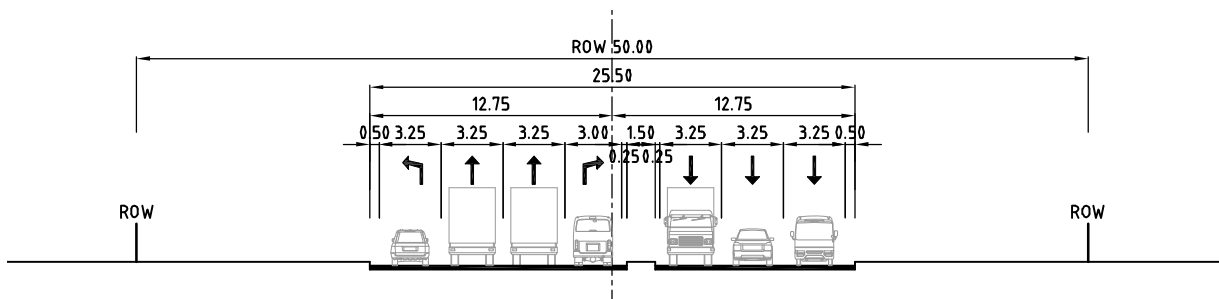
Daladala Bus Stop



Approaching Lanes

Source: JICA Survey Team

Figure 3.4.2 Current Conditions of Nelson Mandela Road at TAZARA (Buguruni Side)



Source: JICA Survey Team

Figure 3.4.3 Current Road Cross Section of Nelson Mandela Road at TAZARA (Buguruni Side)



Source: JICA Survey Team

Figure 3.4.4 Aerial Photography of Nelson Mandela Road at TAZARA (Buguruni Side)

Nelson Mandela Road (DSM Port Side)

On the DSM port side of TAZARA Intersection, Nelson Mandela Road has a ROW width of approximately 50 meters at the approach. As shown in Figure 3.4.6, the approaching direction includes one (1) left-turning lane, two (2) through lanes, and one (1) right-turning lane. In the outbound direction, three (3) lanes are provided. The median width varies from approximately 1.5 to 5.0 meters. Service roads are present on both sides of the main carriageway. Trapezoidal open drainage ditches are constructed between the main roadway and the service roads.

A daladala bus stop is located approximately 230 meters from the intersection in the outbound direction; however, it does not create a traffic bottleneck.



Outbound Lanes



Approaching Section of Intersection



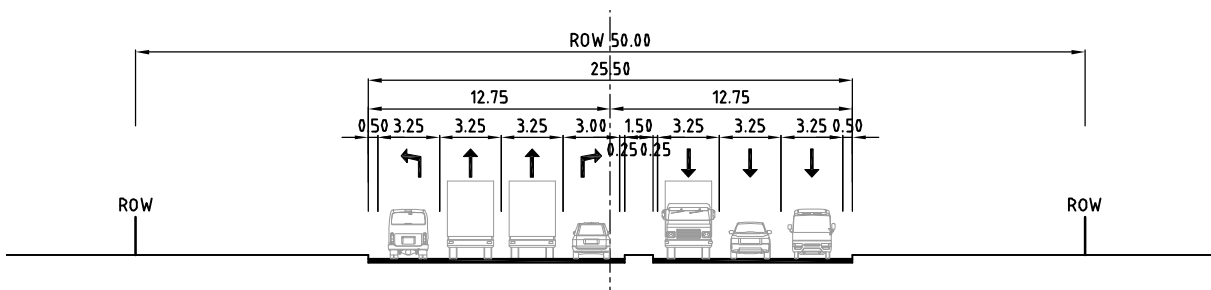
Outbound Lanes



Approaching Lanes

Source: JICA Survey Team

Figure 3.4.5 Current Conditions of Nelson Mandela Road at TAZARA (DSM Port Side)



Source: JICA Survey Team

Figure 3.4.6 Current Road Cross Section of Nelson Mandela Road at TAZARA (DSM Port Side)



Source: JICA Survey Team

Figure 3.4.7 Aerial Photography of Nelson Mandela Road at TAZARA (DSM Port Side)

Nyerere Road

At TAZARA Intersection, Nyerere Road includes a two-lane flyover in each direction, accompanied by a two-lane frontage road on both sides. As shown in Figure 3.4.9, the approach to the intersection comprises one (1) left-turning lane, one (1) through lane, and one (1) right-turning lane. In the outbound direction, two (2) lanes are provided.

Sidewalks are located on both sides of the roadway, beyond the frontage roads, with widths ranging from 2.8 to 4.0 meters. Trapezoidal open drainage ditches are provided between the frontage roads and the sidewalks. A 12.0-meter-wide median space exists between the two flyovers to accommodate the future BRT corridor.



Outbound Lanes to Airport Side



Approaching Section from Airport Side



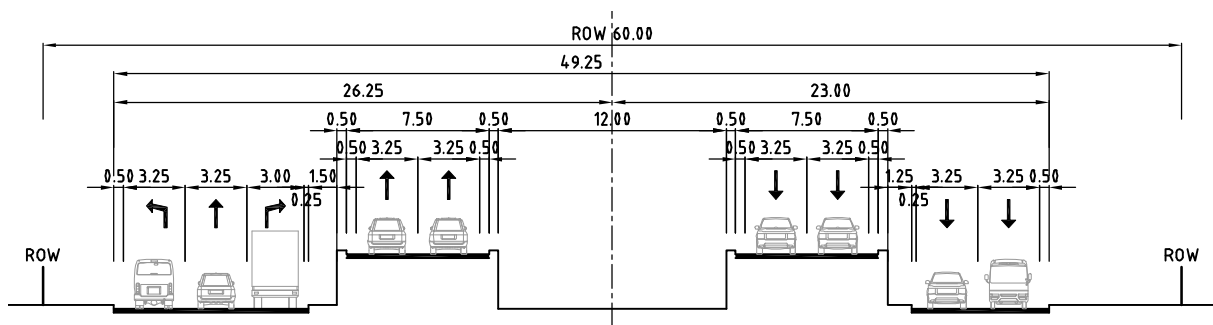
Outbound Lanes to City Center Side



Approaching Section from City Center Side

Source: JICA Survey Team

Figure 3.4.8 Current Conditions of Nyerere Road at TAZARA



Source: JICA Survey Team

Figure 3.4.9 Current Road Cross Section of Nyerere Road at TAZARA



TAZARA Flyover



Nyerere Road (City Center Side)



Nyerere Road (Airport Side)

Source: JICA Survey Team

Figure 3.4.10 Aerial Photography of Nyerere Road at TAZARA

(2) BRT Plan

The BRT plan for the TAZARA Intersection is described in section 3.3 (2).

(3) Recommendation from TANROADS Study

As TAZARA Intersection is already grade-separated, the TANROADS study did not consider any further improvements to this intersection.

(4) Current Land Use

The land use surrounding TAZARA Intersection is shown in Figure 3.4.11. Government-owned land, highlighted in blue, includes parcels occupied by TAZARA Station and the Tanzania Broadcasting Corporation. Privately owned land in the area is primarily used for food manufacturing, office space, and transportation-related businesses.



Source: JICA Survey Team

Figure 3.4.11 Land Use around TAZARA Intersection

(5) Public Utilities

A public utilities survey was not carried out at TAZARA Intersection, as it was not selected as a target intersection for the project.