

Ministry of Transport and Public Works



Malawi National Transport Master Plan

Executive Summary



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**Monkey Bay to Dedza (S127)
descending escarpment with
good roadside drainage**

Executive Summary

Background

The Government of Malawi, with support from the World Bank, has developed this National Transport Master Plan (NTMP), which provides a clear framework for delivering sustainable interventions to enhance the transport sector across Malawi for the period between 2017 and 2037.

The NTMP sets out infrastructure proposals across all transport sub-sectors in Malawi: road, rail, inland water, civil aviation, and urban transport. It covers freight and passenger networks and services, and identifies multi-modal proposals for integrating the transport sub-sectors. The NTMP also provides a prioritised time-bound plan for introducing and developing policy and regulatory measures, institutional and organisational reforms, and capacity-building through the training and enhancement of capabilities in all sub-sectors.

The NTMP has been formulated to support the future enhancement of Malawi's economy. Its vision is "The development of a co-ordinated and efficient transport infrastructure that fosters the safe and competitive operation of viable, affordable, equitable and sustainable transport services". An international comparison reveals that the cost of transport in Malawi is high, which constrains Malawi's economy in two ways: (i) it increases the price of imported products such as fuel, fertiliser, and raw materials; and (ii) it reduces the competitiveness of Malawi's exports.

Current condition of the Malawi economy

- Malawi's **economy** is in a recovery stage after a major fall in GDP from US\$7.9 billion in 2011 to US\$5.4 billion in 2013. According to the Ministry of Finance, Planning and Economic Development, Malawi attained an annual GDP growth rate of 3.1% in 2015. GDP increased by an estimated 5.1% in 2016 from 2015 values^a

Current condition of the transport infrastructure

- The national **classified road** network totals 15,451km, comprising Main (21.7%), Secondary (20.2%), Tertiary (26.7%), District (22.7%) and Urban (8.7%) roads. Only 26% of the national classified road network is paved. According to 2014 data almost 82% of the paved road network in Malawi is in a good or fair condition (IRI^b <5.0). The key issues for the road transport sub-sector include:
 - Presence of bottlenecks, causing congestion and delays on the road;
 - Lack of road capacity in some areas and limited segregated pedestrian facilities, causing major safety issues;
 - Insufficient non-motorised transport friendly infrastructure;
 - Limited availability of all-weather roads, which constrains accessibility for road users, particularly in rural areas;
 - Lengthy and inefficient procedures at border crossings;
 - Lack of a comprehensive rural transport strategy;
 - Funding constraints hindering adequate construction and maintenance of roads; and



GDP is estimated to have increased by 5.1% in 2016.



Only 26% of the national classified road network is paved.

^aMinistry of Finance, Planning and Economic Development.

^bIRI: International Roughness Index, a standard indicator for road surface condition.

- Weaknesses in the relevant organisations' capabilities to adequately manage the road network.
- Malawi's **rail** network is not comprehensive and only serves the central and the southern regions of the country. Most of the network is used predominantly for freight, with only the Limbe-Balaka-Nayuchi sections offering passenger services. The issues surrounding the rail transport sub-sector are:
 - Lack of extensive network coverage throughout the country;
 - Skill gaps and shortage of local expertise and resources in key areas of rail operation and management;
 - Need for strengthening the institutional framework of the Ministry of Transport and Public Works (MoTPW);
 - Lengthy and inefficient procedures at border crossings;
 - Gaps in the regulatory framework; and
 - Lack of integration with other transport modes in the country.
- **Inland water transport** is predominantly based on Lake Malawi, which is approximately 550km long and 75km wide. It is the second deepest lake in Africa. The lake houses four ports, all of which are in poor condition. The Shire River, the largest river in Malawi with a length of 400km, connecting Lake Malombe to the southern regions, also has the potential to play a significant role for the inland water transport system. The issues surrounding the inland water transport sub-sector are:
 - Lack of integration with other modes of transport, and as a result Lake Malawi is not being used to its full potential;
 - Poor navigation systems resulting in slow vessel speeds;
 - Gaps in its regulatory framework, such as the absence of an independent safety regulator;
 - Lack of maintenance of both vessels and port infrastructure resulting in high inefficiency and safety issues;
 - Inadequate institutional capacity for the efficient operation and management of the infrastructure; and
 - Unsuccessful participation of private sector investors to date.



There are 33 air fields in Malawi, which include two major international airports and five secondary airports with international access.

- The **civil aviation** sub-sector in Malawi is not fully developed. There are 33 airfields in Malawi, which include two major international airports, five secondary airports with international access, and 26 airfields with basic airstrips on grass or low-grade materials. International cargo operation by air is limited in Malawi. The key issues surrounding the civil aviation sub-sector are:
 - Limited funds available for infrastructure maintenance;
 - Lack of world class safety standards;
 - Absence of critical infrastructure including navigation aids;
 - Unprofitability of Malawi Airlines;
 - Small international and local markets;
 - Limited cargo operations; and
 - Weaknesses in governance and deployment of modern regulations.
- Malawi's four major cities, namely Lilongwe, Blantyre, Mzuzu and Zomba, currently make up 16% of the national population. The **urban transport** sub-sector of this master plan is built around these four cities. Whilst the proportion of the urban population is relatively low, the combined contribution to GDP of the two major urban areas, Blantyre and Lilongwe, is approximately 31%. Public transport in all of the four cities is predominantly minibus-based. The key issues surrounding the urban transport system are:
 - Unregulated fares of minibuses, causing a demand driven variable fare regime for the end-users;
 - Unregulated routes of minibuses, resulting in an inefficiently planned public transport system in cities;



The four major cities of Malawi currently make up 16% of the national population.

- Limited reach of the minibus services in wider urban areas due to poor road conditions;
- Lack of sufficient road capacity in certain areas, causing high peak hour congestion;
- Lack of adequate bypass or relief roads to avoid the mix of through traffic and local traffic in urban centres, which not only increases congestion but also road accidents;
- Poor road maintenance and poor design standards of roads and junctions, which negatively impacts the day-to-day travel of road users, including by posing a safety hazard;
- Inadequate facilities for non-motorised modes of transport, especially pedestrian facilities, which causes major safety issues; and
- Fundamentally, the absence of an appropriate institution to enable better co-ordination, management, and policy direction for Malawi's cities.

Cross-cutting issues

Malawi's transport infrastructure is susceptible to the negative impacts of extreme weather events, including those associated with climate change, which is increasing their frequency and severity. Transport infrastructure typically has a long operational life that can span decades but the impacts of extreme weather events, such as flooding and drought, can significantly reduce its resilience. Reliable, efficient and safe transport infrastructure underpins sustainable economic and social development and so it is essential that the adaptive capacity of transport infrastructure is increased and that steps are taken to manage greenhouse gas (GHG) emissions from Malawi's transport sector. The NTMP contains required investments and associated planning for climate change adaptation and mitigation activities. One of the key challenges that the MoTPW is facing to respond to the risks and opportunities associated with climate change is the lack of its own related capacity and limited co-ordination with relevant Government agencies. An extensive exercise was conducted to focus on this cross-cutting issue to make the NTMP resilient to current and future adversities such as climate change, both in terms of improvements to physical infrastructure and

required changes to the regulatory, policy and institutional framework.

Other cross-cutting issues include the need for enhanced social inclusion, including explicit consideration of its gender dimension, current limitations to which are hindering access to basic services such as healthcare and education and in particular for vulnerable sectors of the population. It is essential that collective and targeted measures are adopted to meet the needs of diverse social groups.

Existing governance and institutional framework

The various roles and responsibilities within Malawi's transport sector are distributed across a range of public bodies and private sector organisations at the national and local level. MoTPW is the principal steward of the multi-modal transport system, its policies, and regulations. Along with MoTPW's agencies and departments, other external agencies involved in the planning and operation of the transport sector in Malawi include development partners, district and city councils and private sector or concessioners. The current issues surrounding the institutional framework of the transport sector in the country are:

- Acute limitations regarding funding, organisational capacity, technical and managerial skills and strategic planning and programming competencies at almost every level;
- Limited joint working within and across public bodies, with limited mechanisms for information sharing and joint policy formulation;
- Centralisation of local decisions within the Government of Malawi;
- The National Road Safety Steering Group, a key part of the Directorate of Road Traffic and Safety Services' (DRTSS) expanded remit, has yet to be established and lead multi-agency action to tackle Malawi's acute road casualty record;
- An apparent weakness of bilateral and regional actions to secure Malawi's transport goals and relatively loose institutional arrangements to secure delivery and achievement of outcomes; and
- Limited capacity within MoTPW to address climate change issues within the sector.



Locomotive used
for coal transport

Future growth of Malawi

The future growth of transport demand across Malawi will be driven by national economic and demographic changes, which include:

- A doubling of population size between 2016 and 2036 from 16.8 million to 33 million;
- An increase of employment from 5.3 million in 2016 to 9.8 million in 2036. The proportion of urban employment is expected to gradually increase from 11% in 2016 to 15% in 2036 with increased urbanisation;
- Growth of the tourism sector in Malawi, where the contribution of the sector to the economy between 2016 and 2036 is expected to grow by 6.5% per annum, and by 8.5% per annum thereafter; and
- Growth of the overall economy, which is expected to increase steadily between 2016 and 2036 at a rate between 5.1% and 6.7%. Whilst growth within the next ten years would be towards the higher end of the range, it would slow down thereafter.

The above factors will directly influence the growth of both domestic and international transport demand for Malawi. Private transport demand is forecast to grow by 3.5% per annum, and public transport demand by 3.2% per annum over the next 20 years. The table below presents passenger demand (based on a 12 hour day) growth by mode between 2016 and 2036. Freight demand is forecast to grow at a steady rate of 4.8% per annum.

Growth in transport demand (12 hour day)

Private Transport			Public Transport		
2016	2036	Annual average change	2016	2036	Annual average change
116,000	232,000	3.5%	261,000	490,000	3.2%

Key strategic goals of the NTMP

Three strategic objectives have been set to support the vision and guide the development of the NTMP. They are:

- Reduce transport costs and prices across all modes;
- Improve the safety of transport infrastructure and services; and
- Enhanced and sustainable passenger and freight transport systems.

The achievement of these strategic objectives will be guided by the pursuit of the following operational objectives:

- To facilitate a modal shift from road to rail and inland water transport;
- To mainstream safety and security considerations into transport projects, policies and related processes;
- To increase citizens' access to all-weather roads;
- To improve intermodal integration;
- To enhance the connectivity of rural areas, including to support continued growth of the agricultural sector;
- To foster transport systems which support the development of oil and mining sectors;
- To improve the resilience of transport infrastructure and services;
- To develop the domestic freight industry; and
- To reduce dependence on Mozambique for access to international markets.

NTMP components and proposals

The key physical infrastructure components of the NTMP are shown in the table below.

Sub Sector	Main plan components
Roads	<ul style="list-style-type: none"> ▪ Maintenance of the road network ▪ Rehabilitation of all failing sections of the network ▪ Upgrading 1,418 km of rural roads to assist agricultural production and improve rural accessibility ▪ Introduction of over 500 km of segregated cycle/pedestrian facilities on high trafficked roads
Rail	<ul style="list-style-type: none"> ▪ An extension of the railway line from Beira Port (Mozambique) northwards from Mutarara into Malawi, in stages ▪ A spur line from Mbeya to Chilumba
Inland Water Transport	<ul style="list-style-type: none"> ▪ Improved port facilities at Nkhata Bay and roll-on roll-off freight services to Mbamba Bay on the Mtwara Corridor ▪ Introduction of a regular freight service between Chilumba and Liwonde ▪ Construction of a wet port at Liwonde
Civil Aviation	<ul style="list-style-type: none"> ▪ Measures to improve safety and security to world class standards ▪ Runway and apron improvements at Chileka and Kamuzu International Airport to accommodate larger aircraft, and terminal capacity increases ▪ Developing some rural airfields for tourist use ▪ Handing over unused airfields to local authorities and the private sector
Urban Transport	<ul style="list-style-type: none"> ▪ Concession bus routes in high patronage corridors to large buses ▪ Construction of Lilongwe eastern and western bypasses ▪ New urban expressway in Blantyre ▪ Major programme of improved pedestrian and cycle facilities in Lilongwe, Blantyre, Zomba and Mzuzu ▪ Improved traffic management and traffic signal provision in Lilongwe and Blantyre ▪ Bus Rapid Transit scheme in Lilongwe

The main institutional proposals are listed in the table below.

Institution	Proposal
Urban Areas Transport Authority	New autonomous agency with legal powers to grant franchises for high capacity bus routes with low emission vehicles
Road Haulage Industry Council	New agency designed to strengthen the domestic trucking industry and to reduce transport costs, through a system of registration, grading, and capacity building
RAMRAM	New agency, Rail and Marine Regulatory Authority of Malawi, to manage concessions in a co-ordinated fashion
National Transport Council	Inter-ministerial committee designed to ensure the successful implementation of the NTMP to foster economic growth
Ministry of Transport and Public Works	Re-structuring to accommodate dedicated roles and leadership regarding rural transport, urban transport, and international corridors

The main proposals for policy and strategy level changes are listed in the table below.

Sub Sector	Main plan components
Roads	<ul style="list-style-type: none"> ▪ Increase fuel levy to 20% of the pump price ▪ Ring fence RFA's income to the rural roads ▪ Introduce a carbon tax for road users ▪ Improve road safety awareness through updating the school curriculum ▪ Improve regulation and its enforcement
Rail	<ul style="list-style-type: none"> ▪ Improve business planning process ▪ Capacity building for the department of rail and the proposed Rail and Marine Regulatory Authority (RAMRAM)
Inland Water Transport	<ul style="list-style-type: none"> ▪ Introduce new routes for the ferry service ▪ Develop an asset management plan ▪ Improve safety regulations
Civil Aviation	<ul style="list-style-type: none"> ▪ Set up a second airport handling company ▪ The Government to sell its stake in Malawi Airlines
Urban Transport	<ul style="list-style-type: none"> ▪ Introduce design guidelines for urban roads ▪ Develop standards for low emission vehicles ▪ Adoption of sustainable urban transport policy

Integrated options and appraisal

In developing an integrated option, a total of four alternative scenarios were considered. They are presented in the table below.

Scenario	Schemes	Net Present Value (US\$ million)*
Integrated Scenario 1	Rail: Beira-Nsanje Dry port: Salima IWT: Chilumba-Nkhata Bay-Salima-Liwonde	177
Integrated Scenario 2	Rail: Beira-Bangula Rail: Moatize avoiding line Road: M1 dualling – Songwe to Blantyre IWT: Chilumba-Nkhata Bay-Salima-Liwonde	70
Integrated Scenario 3	Rail: Beira-Limbe direct Rail: Chilumba-Mbeya IWT: Chilumba-Nkhata Bay-Salima-Liwonde IWT: Nkhata Bay-Mbamba Bay Road: Blantyre Expressway	212
Integrated Scenario 4	Rail: Beira-Limbe direct IWT: Chilumba-Nkhata Bay-Salima-Liwonde IWT: Nkhata Bay-Mbamba Bay	128

*Net Present Benefits minus Net Present Costs



Dry dock and berthing facilities at Monkey Bay



All of these options have been appraised in terms of the benefits that they could generate. The third integrated option came out as the best option, yielding the highest benefit. The figure below presents a summary of the preferred Integrated Plan (Scenario 3).

Considering the benefits that it would generate, Scenario 3 is by far the best scenario amongst the four integrated alternatives.

The cost of this scenario is high owing to the high cost of the railway link between Bangula and Limbe. An alternative lower cost scenario would be to construct the line only up to Bangula from Beira and additionally the Moatize Avoiding Line, which are part of Scenario 2. It would, however, yield lesser benefit than Scenario 3. Therefore, the recommended integrated scenario is Scenario 3.

Impact of the Plan

High transport costs are an inhibitor to both international trade and domestic freight, and as a landlocked country Malawi relies heavily on road transport, a fact which contributes towards persistently high transport costs. The impact of the proposed interventions promotes a strategic modal shift from road to rail and inland water transport, where larger quantities of cargo can be moved at a lower cost, are shown in the table below:

Transport cost savings US\$ million	Economic benefits US\$ million	Total saving US\$ million	% Cost saving of inland transport	Saving as % GDP
87	189	276	9.0	1.7

The master plan places a heavy emphasis on safety issues and seeks to address them for every transport sub-sector. The road sub-sector addresses the issue from the grass route level through schemes like raising awareness and improving driving skills. The NTMP proposes to promote international safety standards for the design and operation for all modes. The plan also proposes several institutional changes, including the establishment of a National Road Safety Authority.

The measures set out in the NTMP have focused on a core principal of increasing sustainability in the transport sector. The NTMP, as a whole, will have positive environmental and social impacts in terms of improving and strengthening regulatory structures and policy and providing a clear direction for future planning, development, monitoring and enforcement. The measures proposed, including upgrading, maintenance and new developments, have the potential to improve efficiency, connectivity, access and equity.

The actions have been considered in the context of impacts on social dimensions including gender, income, mobility and age. They collectively meet the needs of diverse social groups, and infrastructural, institutional and regulatory measures are proposed to design these considerations into the transport sector planning and operation in the long-term.

Plan costs

The action plan for implementation is programmed into short-term (FY2017 to 22), medium-term (FY2022 to 27) and long-term (FY2027 to 37) plans. The cost of implementing the NTMP is estimated to be US\$9.15 billion. The table overleaf presents the list of proposals which inform this total investment figure.

Proposed interventions, implementation timeframe and cost estimate (US\$ '000)

	FY2017 FY2022	FY2022 FY2027	FY2027 FY2032	FY2032 FY2037	Total
Road Sub-Sector					
Major projects	581,000	464,500	688,000	600,500	2,334,000
Minor capital works and programmes	734,680	743,900	748,900	725,500	2,952,980
District transport infrastructure and management	6,500	12,000	12,000	12,000	42,500
Institutional and regulatory	10,250	3,350	3,350	3,350	20,300
Total of Road sub-sector	1,332,430	1,223,750	1,452,250	1,341,350	5,349,780
Rail sub-sector					
Major projects	344,000	412,000	733,000	726,000	2,215,000
Minor capital works and programmes	38,000	13,000	5,000	5,000	61,000
Institutional and regulatory	14,250	6,250	6,250	6,250	33,000
Total of Rail sub-sector	396,250	431,250	744,250	737,250	2,309,000
Inland Waterways Transport sub-sector					
Major projects	10,000	72,000	30,000	65,000	177,000
Institutional and regulatory	10,250	1,250	1,250	1,250	14,000
Total of Inland Waterways Transport sub-sector	20,250	73,250	31,250	66,250	191,000
Civil Aviation sub-sector					
Major projects	225,150	120,000	98,500	58,500	502,150
Minor capital works and programmes	11,500	117,000	68,500	4,500	201,500
Institutional and regulatory	10,850	3,450	0	0	14,300
Total of Civil Aviation sub-sector	20,250	73,250	31,250	66,250	191,000
Urban Transport sub-sector					
Major projects	39,000	100,000	111,000	101,000	351,000
Minor capital works and programmes	32,500	52,000	47,000	47,000	178,500
Institutional and regulatory	9,500	1,000	0	0	10,500
Total of Urban Transport sub-sector	81,000	153,000	158,000	148,000	540,000
Transport corridors	9,000	9,000	9,000	1,000	28,000
Cross-cutting issues	4,750	4,250	4,250	4,250	17,500
Total estimated cost of the NTMP	2,091,180	2,134,950	2,566,000	2,361,100	9,153,230



**Apron at Chileka
International Airport**

Plan financing

The cost of the NTMP programme at US\$9.15 billion is very high but is an accurate representation of the funds required for the sector to address maintenance and development expenditures that will result in an improved transport sector for Malawi. Of the total requirement, the sub-sectoral requirements between 2017 and 2037 are:

- Road sub-sector: US\$5.35 billion;
- Rail sub-sector: US\$2.31 billion;
- Civil Aviation sub-sector: US\$718 million;
- Inland Water Transport sub-sector: US\$191 million; and
- Urban Transport sub-sector: US\$540 million.

An additional US\$45.5 million will be required to address other cross-cutting issues and regional corridor development.

There are several funding sources and potential financing streams available for funding the NTMP programme. The main development partners in the country are the World Bank (WB), the African Development Bank (AfDB), European Commission (EC), Japan International Cooperation Agency (JICA), Republic of India, People's Republic of China, Kuwait Fund, Arab Bank of Economic Development in Africa (BADEA) and Organisation of the Petroleum Exporting Countries (OPEC) Fund.

Public sector funding for transport infrastructure projects is not only through the MoTPW. Programmes such as the Agriculture Sector Wide Approach have financed upgrading, rehabilitation, and maintenance of rural roads. It is therefore important to consider wider beneficiaries from the mining and agricultural industries for example as a source of funding. In addition, the Government can consider issuing bonds to raise capital for project funding.



**Cost of the NTMP programme
US\$9.15billion.**

There is scope for private sector participation in the NTMP implementation, which can be arranged through PPP or different transfer options such as Build Operate Transfer (BOT), Build Own Operate Transfer (BOOT), concession and privatisation.

Specifically, for cross-cutting issues like climate change, there are several global and regional funds that the Government of Malawi can consider, including the Adaptation Fund (AF), The Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF), Africa Climate Change Fund (ACCF), and the Green Climate Fund (GCF).

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