Ministry of Transport and Public Works

Malawi National Transport Master Plan

Road Sub-Sectoral Plan

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Acronyms

AADT	Annual Average Daily Traffic
AfDB	African Development Bank
ANRP	Annual National Road Programme
BADEA	Arab Bank for Economic Development in Africa
CAFAM	Clearing and Forwarding Agents in Malawi
COF	Certificate of Fitness
COMESA	Common Market for Eastern and Southern Africa
DA	Donor Agencies
DC	District Council
DGSA	Dangerous Goods Safety Administrator
DLG	Department of Local Government
DRC	Democratic Republic of Congo
DRTSS	Directorate of Road Traffic and Safety Services
DVLA	Driver and Vehicle Licencing Authority
EITI	Extractive Industries Transparency Initiative
ERP	Economic Recovery Programme
EU	European Union
FESARTA	Federation of East and Southern African Road Transport Associations
FF	Freight and Forwarders
FFAM	Freight and Forwarders Association of Malawi
FISP	Farm Input Subsidy Program
FORS	Fleet Operator Recognition Scheme
GDP	Gross Domestic Product
GoM	Government of Malawi
HDM4	Highway Development and Management System
IGWP	Income-Generating Public Works Programme
IRAP	International Road Assessment Programme
IRI	International Roughness Index
JTSR	Joint Transport Sector Review
KF	Kuwait Fund
Km	Kilometres
LDF	Local Development Fund
MALTIS	Malawi Traffic Information System
MASAF	Malawi Social Action Fund
MGDSII	Malawi Growth and Development Strategy II
MWK	Malawian Kwacha
MOAM	Minibus Owners Association of Malawi
MoAIW	Ministry of Agriculture, Irrigation and Water
MoH	Ministry of Health
MoLGRD	Ministry of Local Government and Rural Development
MoGCDSW	Ministry of Gender, Children, Disability and Social Welfare
MoITT	Ministry of Industry, Trade and Tourism
MoNREM	Ministry of Natural Resources, Energy and Mining
MoEST	Ministry of Education, Science and Technology
MOTPW	Ministry of Transport and Public Works
MPC	Malawi Ports Company
MPS	Malawi Police Service
MRA	Malawi Revenue Authority
MSC	Malawi Shipping Company
MST	Main, Secondary and Tertiary

MT	Metric Tonnes
NCIC	National Construction Industry Council
NDP	National Decentralisation Policy
NDRP	National Disaster Recovery Programme
NMT	Non-Motorised Transport
NRA	National Roads Authority
NRSCM	National Road Safety Council of Malawi
NSC	North-South Corridor
NTMP	National Transport Master plan
NTP	National Transport Policy
PIDA	Programme for Infrastructure Development in Africa
PPP	Public Private Partnership
PPPC	PPP Commission
PVHES	Plant and Vehicle Hire and Engineering Services
RA	Roads Authority
RDA	Road Development Authority
RDMS	Road Data Management System
RFA	Roads Fund Administration
RHIC	Road Haulage Industry Council
RIDMP	Regional Infrastructure Development Master Plan
RIDP	Rural Infrastructure Development Programme
RLW	Registered Laden Weight
RMI	Road Maintenance Initiative
RSI	Road Side Interviews
RSP	Road Sector Programme
RTA	Road Traffic Accidents
RTD	Road Traffic Department
RTG	Rubber Tyred Gantry
RTSA	Road Transport and Safety Authority
RTOA	Road Transport Operators Association
SADC	Southern African Development Community
SATCC	Southern African Transport and Communications Commission
SATTFP	South Africa Trade and Transport Facilitation Programme
SDG	Sustainable Development Goal
TCM	Transport, Communications and Meteorology
TEU	Twenty feet Equivalent Unit
TSIP	Transport Sector Investment Programme
TSP	Transport Sector Plan
TSP	Transport Strategy Process
US	United States
VIS	Vehicle and Inspection Services
WB	World Bank
WFP	World Food Program
WHO	World Health Organisation

The M1, wide hardshoulder with separate pedestrian earth track

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Malawi National Transport Master Plan

1 Introduction

Road Sub-Sectoral Plan

1 Introduction

1.1 Introduction to the National Transport Master Plan

The Government of Malawi commissioned WS Atkins in February 2016 to prepare a National Transport Master Plan (NTMP). The primary objective of the study is the development of a plan to guide the sustainable development of an integrated multi modal transport sector over the period 2017 to 2037.

The study has identified the requirements of the sector in terms of the transport provision required for freight and passenger services under each mode of transport and potential inter-modal transfer facilities. The NTMP includes a prioritized time bound plan for institutional (organisational, policy and regulatory) reform and capacity building in all sub-sectors. This detailed master plan for the road transport sub-sector has been developed working with the concerned agencies and organisations, in both the public and private sector.

1.2 Introduction to the road sub-sector plan

1.2.1 Context and strategic value

Road transport is the dominant mode of transport in Malawi for passenger and freight transport in urban and rural areas. Roads currently carry 99% of all passenger transport, 70% of domestic freight and 90% of international freight, with the modal share similar in both urban and rural areas. They are the only means of accessing, and travelling within, most urban and rural areas and there is no indication that this will change.

As a land-locked country with export-led growth, reliable road access is crucial for Malawi's economic development and prosperity. The country is heavily dependent on links to regional and overseas markets for the transfer of goods, and while linked to such markets by rail and air transport market access is predominantly via road. In 2015, road transport accounted for the movement of 87.2% of imported and exported goods by tonnage, with rail taking 12.3%, and air transport 0.5%.

As detailed above, more than 70% of internal freight is transported by road. The agriculture sector is responsible for generating a third of GDP and for employing 80% of the country's population and as with other industries relies heavily on the road network for its inputs, such as access to and distribution of fertiliser, and trading of its outputs. Malawi's high transport costs are said to be the main component of the price of commodities traded by subsistence farmers in districts across the country, and so access to the road network and ease of travelling on it impacts profitability, which has a knock-on impact on social welfare. The growth of the tourism sector is also dependent upon roads and while more localised, the viability of Malawi's mining sector, which is expected to experience considerable growth over the period 2016 to 2036, is similarly reliant on road access.

The road network has a direct impact on social as well as economic outcomes. They are the primary means of accessing employment, health, education and other social services in Malawi and any change in the time, cost and effort required to access these facilities affects social welfare and life opportunities for Malawi's population. Difficulties of accessing educational facilities by road, for example, have resulted in high absenteeism and drop-out rates in schools, pupils attending school from a higher age than recommended, children having insufficient energy to concentrate during lessons, and children experiencing attacks on the journey to or from school. This can result in children choosing not to attend school or parents opting not to send their children to school, and the impact on the population's life opportunities, and by extension the future of the country, is direct and pronounced.

At a superficial level, the value of Malawi's road network is also linked to its asset value, which exceeds 30% of GDP. In terms of the classified road network, a comparison of road density in Sub-Saharan African countries conducted using 2008 data revealed that Malawi has the third highest primary road density (approximately 750km of road per million population) and the second highest secondary road density (approximately 500km per million population) of the 48 countries in Sub-Saharan Africa.

1.2.2 History of the road sub-sector

It was not until the 1920s that Malawi had roads that were navigable by motorised vehicles. The UK established the Nyasaland and District Protectorate in 1891 and during the first few decades of British rule roads remained little more than tracks. The southern part of the country was the first to benefit from road infrastructure development, and it was not until the late 1930s that there were more than a handful of all-weather roads in the north of Malawi.

The majority of tracks that preceded the development of all-weather roads could not be navigated in the wet season. Inland waterways were instead considered the most convenient mode of transport but travel once on the adjoining road infrastructure was challenging, costly and inefficient and relied on headload and ox-cart. Malawi's railway opened in 1907 and Government regulations designed to promote its use hindered the development of the road network, which as a result remained concentrated in the south of the country. The road network was so slow to develop that at the time of Malawi's independence in 1964 there were still very few paved roads in the country. A number of road infrastructure development and improvement proposals were made in the intervening years, but they were not implemented.

A period of growth from 1960 led by agricultural exports from estates was facilitated by investments in transport infrastructure, and the road network continued to improve. A milestone was the completion of the M1, Malawi's national highway, in 1971 – the recipient of finance from the World Bank's first lending operation in Malawi, which also financed a study of Malawi's road transport regulations and co-ordination between the road and rail sub-sectors.

Road infrastructure development slowed from 1979 owing to the impacts of oil price increases and the civil war in Mozambique, but as stability increased so did road transport infrastructure. This benefitted from some support from development aid, but the majority was used to support recurrent or consumption spending as opposed to addressing Malawi's infrastructure deficits.

There remains a road infrastructure funding gap, but a sizeable road investment programme has since improved the extent of Malawi's road network and road condition. In the 2000s almost half of Malawi's US$200 million per year infrastructure spending (6% of GDP) was invested in the transport sector. The inadequate maintenance of the roads constructed has since served to undermine some of this investment, but Malawi's paved road density is higher than the average in other low-income African countries as a result (141.2km/1,000 km2 of arable land relative to an average of 86.6%), and the paved and unpaved road network condition is higher in Malawi than the average of low-income and middle-income African countries.

The World Bank has financed road maintenance and improvement activities in Malawi since 1981, providing related assistance, capacity building and equipment. A Road Maintenance Initiative (RMI) was later commissioned in response to concerns regarding the maintenance of Malawi's road network, and in 1998 a National Roads Authority (NRA) was established to improve the country's road network management. The operational and financing function of the NRA were subsequently separated, and resulted in the establishment of two institutions:

- Roads Authority (RA), which was established by the Roads Authority Act No. 3 of 2006 with a remit of ensuring that public roads are adequately constructed, maintained or rehabilitated; and
- Roads Fund Administration (RFA), which was established by the Roads Fund Administration Act No.4 of 2006 with responsibility for raising, administering and accounting for funds for construction, maintenance and rehabilitation of public roads in Malawi.

These institutions were designed to incorporate best practice institutional design, and experience to date indicates that they are jointly helping to enhance transparency and accountability and promote efficiency in the management and financing of Malawi's roads. In 2013 key donors suspended direct budgetary support to Malawi owing to issues of public financial mismanagement, but Malawi continues to receive approximately US$1 billion from various donors annually via the financing of programmes and designated grants, and donors such as the World Bank and AfDB will continue to support road infrastructure development in country in collaboration with these institutions. Sector budget support for transport has not been re-instated.

1.3 **Aims and objectives of the road sub-sector plan**

The primary objective of the overall study is the development of a National Transport Master Plan (NTMP) to guide the sustainable development of an integrated multi modal transport sector for Malawi over the period 2016 to 2037. Three strategic objectives have been developed to support to guide the development of the overall NTMP:

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

The aim of this sub-sectoral plan is to guide the sustainable development of the road sub-sector, as a component of an integrated multi-modal network, for the period 2017 to 2037. In particular, it aims to set out proposals to reduce transport costs and improve the efficiency and safety of the sub-sector.

The sub-sectoral plan is expected to deliver:

- Outline a strategy containing requirements for the reform of the sub-sector; and
- Detail the actions that are required to implement the strategy, including in relation to their phasing, resource requirements, and roles and responsibilities of stakeholders.

In order to deliver the above this plan considers the road sub-sector in terms of:

- Physical infrastructure (road network);
- Modes that it serves (motorised and non-motorised, public and private);
- Trip purposes (freight and passenger);
- Stakeholders (including Government officials and passenger and freight road users);
- Governance;
- Institutions; and
- Policy and regulatory framework.

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

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Malawi National Transport Master Plan

2 Existing infrastructure

Road Sub-Sectoral Plan

2 Existing infrastructure

2.1 Overall road network

Malawi is served by a relatively extensive and coherent network of roads that comprises links ranging from paved main roads to narrow unpaved tracks and trails.

The country has benefited from a relatively large road investment programme that has seen the length of the paved road network in Malawi increase by 37% over the period 2000 to 2010 while the length of the unpaved road network increased by 14%.

Figure 2.1 shows the main and secondary roads, which constitute a comprehensive network. The national highway, M1, spans the length of the country from Nsanje in the south to Chitipa in the north. Malawi's classified road network is complemented by undesignated community roads. The length, nature and value of the road network is summarised in Table 2.1.

As shown in Table 2.1, 70% of Malawi's main roads, by length, are paved, along with 10% of secondary roads and 1% of Tertiary roads. All 9,478 km of community roads are unpaved and yet to be classified. The value of the road asset has been calculated by assessing the cost to re-build the network, or to build it today starting from scratch. The estimated construction costs to achieve this are listed in Table 2.2

Approximately 50% of the road network's asset value is provided by the main roads. The total asset value is around US $5.8 billion. This means that roads, taken together, are one of the Government's most valuable assets, and worth more than a number of key private sector assets, as shown in Table 2.3.

Table 2.2 Road construction costs, per km

Class	Paved (US$)	Unpaved (US$)
Main	950,000	300,000
Secondary	750,000	250,000
Tertiary	650,000	200,000
District	450,000	150,000
Urban	500,000	200,000
Community	-	50,000

Source: Consultant

Table 2.3 Asset values: Malawi roads and selected private companies

Company	Asset value (US$ million)
Malawi roads	5,852
Press Corporation	614
Illovo Sugar (Malawi)	149
Sunbird	24
TNM	58

Source: Consultant

Table 2.1 Malawi's road network

Road class	Paved			Unpaved			Total		
	km	%*	Asset value (US$ million)	km	%	Asset value (US$ million)	km	%	Asset value (US$ million)
Main	2,809	69	2,827	548	4.8	114	3,357	21.7	2,942
Secondary	442	10.9	385	2,683	23.6	653	3,125	20.2	1,038
Tertiary	44	1.0	29	4,077	35.8	815	4,121	26.7	844
District	8	0.2	4	3,492	30.7	524	3,499	22.7	527
Urban	770	18.9	386	578	5.1	115	1,349	8.7	501
Community [undesignated]	0	-	-	9,478	100	unknown (u/k)	9,478	100	u/k
Tracks	0	-	-	u/k	u/k	u/k	u/k	u/k	u/k
Total classified rural (non-urban) roads	**3,304**	**-**		**10,800**	**-**		**14,102**	**-**	
Total classified	**4,074**	**-**	**3,630**	**11,378**	**-**	**2,222**	**15,451**	**-**	**5,852**

Source: based on Roads Authority (2015). * rounded % of the total classified network

Figure 2.1 Malawi's primary and secondary road network

Legend

- Main Roads
- Secondary Roads
- Major Cities
- Major Lakes
- Country Borders

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The extent of the road network is considered sufficient but the capacity of some links, particularly in rural areas, is inadequate. A number of community roads, for example, are too narrow to accommodate bicycles along with other both motorised and non-motorised vehices. Furthermore the number of road brides at numerous locations in districts is inadequate. The main concern is the potential for conflict, which has implications for road safety, particularly given the lack of dedicated provision for non-motorised transport (NMT). In urban areas there tends to be provision for walking and cycling, notably in terms of pavements although with varying levels of accessibility and maintenance, but in rural and inter-urban areas it is relatively rare to find dedicated infrastructure forcing walkers and cyclists to either share carriageways with motorised vehicles or walk alongside the road. A number of examples of NMT infrastructure (or lack of infrastructure) are provided in Figures 2.2 to 2.5.

Figure 2.3 High capacity and segregated space for pedestrians

Non-continuous provision means that pedestrians still come into conflict with motorised vehicles at the start and end of the link (Lilongwe).

Figure 2.5 Dedicated pedestrian space

Inferior standard footways to that for motorised vehicles (Lilongwe).

Figure 2.2 Inadequate footways

Pedestrians forced into the carriageway in Chitipa (above) and Lilongwe (below).

Figure 2.4 Lack of demarcation

Space for motorised and non-motorised road users, but no demarcation of space thereby enhancing potential for conflict (Salima).

In addition to insufficient capacity and provision for all road users, road surfacing is also negatively impacting accessibility, again particularly in rural areas where even key links to district centres are unpaved (see an example in Figure 2.6). Almost 84% of Malawi's road network, for example, is unpaved with either an earth or gravel surface, and in 2010 it was estimated that the majority of Malawi's rural population lives more than 2km from an all-weather road (World Bank, 2010). The

proportion has since increased and is higher than the average in low income countries, where the average is 78%, but remains low in both absolute terms and relative to more affluent countries.

The majority of the unpaved roads are district roads, which link communities with wider rural and urban networks, as well as to the main roads. The length of the paved road network would need to increase by 36% (1,486km) in order to make 35% of Malawi's rural population 2km from an all-weather road. The cost is currently prohibitive, but a review of road investment in Malawi (World Bank, 2010) found that approximately 20% of Malawi's paved road network has been over-engineered. It could

Figure 2.6 Unpaved district road in Kasungu, road to Kasungu District Council Office

therefore be beneficial to re-evaluate resource allocation. This is true not only between capital projects in the road sub-sector but between capital and revenue funding as the condition of the road network, outlined below, indicates the need for an increase of investment in road maintenance.

The condition of the paved road network is considerably better than that of the unpaved road network. The condition of unpaved roads tends to be compromised by dusty conditions, uneven surfacing and potholes, while paved roads across the country exhibit signs of general wear-and-tear and shoulder degradation.

2.2 Rural roads and transport

2.2.1 Extent of the road network

Rural areas in Malawi are served by a relatively extensive and coherent network of roads. This road network comprises diverse links, which range from paved main roads linking towns and cities to narrow unpaved tracks and trails in more remote areas. At the time of the 2009 Road Data Management System (RDMS) survey, the classified road network[1] comprised 15,451km of roads (Roads Authority, 2013). This is complemented by another 9,478km of undesignated community roads, which were identified in 2005 as being an essential part of the highway infrastructure, and by a wider network of tracks, only some of which can be navigated by motorised vehicles.

In terms of the classified road network, a comparison of road density in Sub-Saharan African countries conducted using 2008 data revealed that Malawi has the third highest primary road density (approximately 750km of road per million population) and the second highest secondary road density (approximately 500km per million population) of the 48 countries in Sub-Saharan Africa (Gwilliam et al., 2009). This measure of road density is a function of population density, and Malawi's classified road network serves a relatively dense population of 177 people per km^2 of land area (overall), which is more than quadruple the average of countries in Sub-Saharan Africa (World Bank, 2016). The population density of rural areas in Malawi is also relatively high at 155 people per km^2 but its distribution still poses considerable connectivity challenges and there are gaps in the road network, the classified area of which is relatively low in absolute terms and when measured as a function of land area (as opposed to population).

In terms of extent of the road network the number of the culverts and bridges and their absence on certain key desire lines is perceived to be inadequate in districts across the country.

2.2.2 Nature of the road network

The majority of Malawi's road network is unpaved with either an earth or gravel surface. This includes all of the 9,478km of undesignated community roads and 74% of its classified road network (see Table 2.1). It is essential not to disregard or underestimate the importance of these undesignated roads. The main and secondary roads are not typical of rural areas, rather corridors that form part of the country's hub-and-spoke system. Tertiary and district

1 These comprise main, secondary, tertiary, district and urban roads.

roads are the primary means of rural access and on a national level only 0.7% of these are paved.

The nature of the road network does, however, vary considerably between districts. In Rumphi, for example, more than 92% of the road network is unpaved. This is shown in Table 2.4, which also gives an indication of how extensive the undesignated (and entirely unpaved) road network is in Malawi's districts.

The Sustainable Development Goals (SDGs) use the indicator 'proportion of the rural population who live within 2km of an all-season road[2]' (Indicator 9.1.1) to track progress towards their target to 'develop… infrastructure… to support economic development and human well-being' (UN, 2016). In 2010 it was estimated that 74% of Malawi's rural population lives more than 2km from an all-weather road (World Bank, 2010). This figure does not seem to have significantly improved. It is below the average of 78% for low income countries but is low in both absolute terms and relative to developing countries in other continents and in middle-income countries, where the average is 40%. It is also of particular concern given Malawi's high dependence on agriculture.

Malawi's all-weather road network would need to quadruple in order for the entire rural population to be within 2km of an all-weather road, although in practice the associated improvements required would likely be higher as the term 'all-weather' often refers to a road's design and construction standard as opposed to its condition, which varies considerably across the network.

In spite of considerable rural road investment needs, a 2010 review (World Bank) found that approximately 20% of Malawi's paved road network has been over-engineered. It could therefore be beneficial to re-evaluate

Figure 2.7 Unpaved road in Chikwawa

Sugar growing area during the harvest.

the resource allocation between capital and maintenance investment and project prioritisation in the road sub-sector.

2.2.3 Condition of the road network

A number of recent programmes have upgraded, rehabilitated and sought to improve the maintenance of rural roads in Malawi. In 2010 26% of the classified road network was in a 'poor' condition, and while some of this network will have since been upgraded and maintained there is also the potential for deterioration – approximately 60km of paved highway is either rehabilitated or resealed annually and without more frequent rehabilitation and periodic maintenance the condition of paved roads is likely to worsen. This data is based on the International Roughness Index (IRI) and do not take account of other factors such as shoulder condition, which are important to non-motorised transport on rural roads. It is understood that more recent data were collected in 2015, which may well show a deterioration of conditions since 2010.

Table 2.4 indicates the need for improved maintenance, the cost of which has been estimated to be approximately two to three percent of asset value, US$146 million per year

Table 2.4 An overview of the road infrastructure in Rumphi

Road class	Bitumen		Gravel		Earth		Total	
	km	%	km	%	km	%	km	%
Main	80.1	53	11	7	61	40	152.1	14
Secondary	0	0	0	0	128.6	100	128.6	12
Tertiary	0	0	0	0	122.8	100	122.8	11
District	0	0	0	0	89	0	89	8
Undesignated/ community	0	0	0	0	618.2	100	618.2	56
Total	80.1	7	11	1	1,019.6	92	1,113.7	-

2 Roads do not need to be paved to be all-weather and a range of surface materials can protect road surface from weather if well-constructed and maintained.

**% of each road class which is bitumen, gravel, earth.*

Current expenditure on road maintenance is below the level needed to sustain the infrastructure and is eroding the value of the investments. This does not appear to be owing to design standards. A review of the standard design and construction reference documents that are being used by the MoTPW and the Roads Authority, for example, reveals that they are well suited to Malawi. Key contributory factors instead include travel demand, which is seeing roads accommodating higher traffic volumes and vehicles of a greater weight than they were designed to bear. High transport costs are exacerbating this problem as transporters are increasing their profits by overloading their vehicles to reduce costs. An axle load survey conducted in this study, for example, found that there is substantial overloading on roads in Malawi. Data collected from weigh stations revealed that of 981 vehicles weighed in Malawi 562 (57%) were found to be overloaded and carrying loads considerably higher than their Registered Laden Weight (RLW) indications.

The condition of Malawi's roads is also being negative impacted by the country's changing climate. In the wet season rainfall is increasing, deforestation is speeding up the rate at which water travels across the land, and rising levels of sand in waterways and water from irrigation initiatives are exacerbating related pressure on drainage systems. The impacts can range from reducing the speed at which vehicles can travel on a stretch of road to making roads impassable and causing erosion that serves to compromise accessibility beyond the wet season. The impact is particularly pronounced on tertiary and district roads, only 0.68% of which are paved. Most of the unpaved rural road network has an earth surface, a considerable proportion of which is either constructed from poor strength natural sub-grade material or is entirely unimproved. In the wet season, some of these are only navigable with adequate drainage facilities and clearance.

The need to improve the condition and state of repair of the rural road network was raised as a priority in all district consultations although the condition is said to be markedly better in some districts than others. Roads in Thyolo, for example, are said to be in a generally good condition as a result of the district having benefited from a number of projects that focused on improving road conditions – the European Union's (EU) Rural Infrastructure Development Programme (RIDP) and Income-Generating Public Works Programme (IGPWP) and the World Bank funded Malawi Social Action Fund (MASAF). The roads under these projects roads are subject to frequent maintenance funded by the Local Development Fund (LDF), and the Roads Fund Administration (RFA).

In an analysis commissioned by the World Bank, Foster and Shkaratan (2010) found that expenditure on road maintenance in Malawi was approximately 24% below the level needed to sustain the infrastructure. The general condition of the network is said to have improved 'slightly' during the past five years, but a reduction in expenditure on maintenance has been reported (DRTSS, 2015). The shortfall therefore appears to have increased and is having a negative impact in terms of both the amount and quality of maintenance that's being performed. There are inadequate financial resources available to address the maintenance backlog and new demands, and a number of Central Government officials have suggested that insufficient maintenance activity at the district level is also a contributory factor to the poor condition of certain rural roads (see section 2.5). This is reinforced by District Councils (DC), who cannot afford to purchase basic tools needed for maintenance owing to budget cuts and do not have enough manpower locally to improve road conditions manually. The consequence is an erosion of the benefits of the capital investments in Malawi's road network.

Table 2.5 Condition of Malawi's classified road network as of June 2010

Road class	Paved		Unpaved		Total	
	km	%*	km	%*	km	%*
Good	2,426	60	5,000	44	7,426	48
Fair	1,361	33	2,654	23	4,015	26
Poor	286	7	3,274	33	4,010	26
Total	4,073	-	11,378	-	15,451	-

** % of the total length of road*

2.2.4 Design and construction standards

A review of the standard design and construction reference documents that are being used by the MoTPW and the Roads Authority (RA) reveals that they are well suited to Malawi. They include standard international references for highway works that have been widely tried and tested in the tropics and the Southern African Transport and Communications Commission (SATCC) Specification, which was developed in Southern Africa based on standard international construction procedures but tailored to locally available materials, therefore satisfying locally recommended design methodologies.

A number of rural road and bridge characteristics were widely criticised at district workshops, but the review of standards being used suggests that these concerns can be attributed to inadequate:

- Assessment of need (for example in terms of capacity, type of road user and surface type);
- Quality of work delivered by private contractors/ inadequate supervision by the Roads Authority;
- Maintenance (standard and frequency); and
- Legacy, with much of the highway network, and particularly the unpaved roads, having been constructed to cater for lower traffic flows and using now outdated construction techniques.

In summary, the four most common concerns raised regarding rural transport road infrastructure were identified as follows:

Insufficient capacity of roads and bridges of the classified and unclassified network. In extreme cases trails are too narrow for bicycles to navigate, but more often infrastructure is not wide enough to accommodate all road-users, which leads to conflicts. In the case of bridges, many are single lane and are more suited to bicycles than to motorised vehicles. In addition, the design and construction of roads (for example in terms of surface material characteristics and layer thickness) does not always reflect traffic volumes.

Bridge construction materials. Many bridges are constructed from timber. There is a programme to replace these with concrete structures but it is currently a cause for concern as washaways are common in the wet season.

Road construction materials. As detailed previously, only 0.7% of tertiary and district roads are paved and most of the unpaved rural road network has an earth surface, a considerable proportion of which is either constructed from poor strength natural sub-grade material or is entirely unimproved. This can make roads difficult to navigate, particularly in the wet season, to the extent that certain areas become inaccessible. Additional protection is said to be required in numerous locations to prevent mud and puddles in the wet season and dust and corrugations in the dry season, and also to reduce the likelihood of washaways.

Inadequate road drainage. Malawi's climate is changing. In the wet season rainfall is increasing, deforestation is speeding up the rate at which water travels across the land, and rising levels of sand in waterways and water from irrigation initiatives are exacerbating related pressure on drainage systems. This is deteriorating the condition of transport infrastructure and there are no formal adaptation plans in place.

2.2.5 Road rail crossings

Level crossings are in many forms depending on whether they are on a public or private road, or for vehicle, horse or pedestrian use. The protection arrangements which are appropriate at level crossings will vary, depending upon the crossing location, for example proximity to road junctions, the level of use and the type of railway traffic. An important factor in assuring the safety of level crossings is providing, so far as circumstances permit, a consistent appearance for road and rail users of any crossing.

In general there are 5 types of road rail crossings. These are as follows:

1. Grade separation crossing over a road overbridge;
2. Manned crossings which are manually controlled by full width lifting barriers;
3. Manned and fitted crossing with mechanical full width swinging barriers integrated with signal interlocking system;
4. Unmanned crossing without barriers but with warning signs; and
5. Unmanned or open crossings without barriers or warning signs.

The majority of crossings in Malawi are either category 4 or 5.

Pedestrian and vehicle conflict on the M1 in Mzuzu

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Malawi National Transport Master Plan

3 Existing services

Road Sub-Sectoral Plan

3 Demand for travel on the road network

This section summarises the role of the private sector in delivering services on the road network, including freight companies and public transport operators, such as minibuses and paratransit service providers. It first looks at public transport and then at freight transport.

3.1 Public transport

Road-based public transport, in the form of minibuses, buses, coaches, taxis, bicycles, and motor-cycles, is operated by private sector companies and individuals who collect fares and retain the revenue. Details regarding the relationship between the amount of revenue collected and the relationship with operating costs are not known although fares, which are set by operators, tend to be relatively high by international standards. This is largely attributed to the country's relatively high fuel prices and the absence of any Government fare subsidy programmes.

Public transport operators are bound by a regulatory framework and many are a member of minibus or kabaza associations. There are, however, considerable gaps in the governance and regulatory framework in which they operate. The regulations regarding public transport, for example, specify vehicle and driver licensing requirements but do not extend to any specification of service quality, route or fares. The regulations are also not routinely enforced and illegal forms of transport such as matola (travel on vehicles not licensed for passenger service) are fundamental to rural mobility (31% of the rural transport survey respondents travelled by matola, exceeded only by minibus users). The result is a sub-sector characterised by minimal organisation and operating standards and public transport services that can be uncoordinated, unreliable, unsafe, and relatively expensive to use.

The organisation of public transport operators varies between districts. A Minibus Owner's Association of Malawi (MOAM) was established to represent minibus drivers and improve the quality of service provided by ensuring that vehicles registered with the association possess a Certificate of Fitness (CoF), are covered by adequate insurance and meet other safety requirements. It originally set fares but this function was removed over concerns regarding fair trading. Its role may, however, soon be extended to regulate routes served and to assign related permits to drivers. Several of the association's processes are also being reviewed in the context of criticisms that it has faced in terms of member registration.

In the absence of regulations that specify public transport service quality, vehicle conditions, route and fare, and the lack of enforcement of existing regulations, have contributed towards the provision of relatively unreliable public transport services, particularly in rural areas where travel demand tends to be more geographically dispersed than in urban areas and the ability of local populations to afford to use the services has had a negative impact on supply.

3.2 Freight transport

3.2.1 Structure of the industry

Commercial road freight transport services in Malawi comprise:

- Domestic road freight haulage including local and regional movements in addition to movements to the national border points; and
- Cross-border and international road freight haulage.

The Malawi road haulage sector is entirely operated by the private sector and dominated by a handful of medium sized companies operating several hundred vehicles but there are also a high number of small operators that act at the local and regional level. The Road Transport Operators Association (RTOA) consists of 172 members, most which are small scale and local operators (predominantly only 2 to 5 vehicles in operation). The major companies typically operate a much larger fleet of vehicles. The market size and structure is summarised in Table 3.1. Domestic and international freight

Table 3.1 Commercial road transport companies, staffing and fleet

Scale of operation	Number of companies	Average number of employees	Average number of vehicles in fleet	Average fleet type
Domestic – local/ regional	172	15	5	Rigid 7.5t
Cross border and international	30	50	100	Rigid 32t

Source: RTOA and Consultant

Table 3.2 Freight modal share and volume of exports and imports (in thousands of tonnes)

	2000	2001	2002	2003	2004	2005	2006	2015
Road	711	806	1,876	1,342	1,448	1,470	1,365	2,574
Rail	256	276	280	233	224	171	171	180
Total	**967**	**1,082**	**2,156**	**1,575**	**1,672**	**1,641**	**1,536**	**2,754**
% road	**74**	**74**	**87**	**85**	**87**	**90**	**89**	**93**

Table 3.3 Truck weight data collected at eight locations

	Single axle overload	Tandem axle overload	Tridem axle overload	Gross vehicle mass (GVM) overload
Number of vehicles surveyed (% of total)	35 (4%)	515 (52%)	184 (19%)	4 (<1%)
Average weight (kg)	1929	4958	1307	3510
Number of overloaded vehicles (% of total)	**562 (57%)**			

Muloza, Mwanza, Chiponde, Dedza, Songwe, Marka, Balaka and Mchinji

companies both operate in Malawi and it tends to be the international operators, mostly from Mozambique and South Africa, which capture the majority of international trade logistics. This is hindering the growth and competitiveness of Malawian transporters and there is a perception that the industry is driven by cartels that reduce domestic competitiveness.

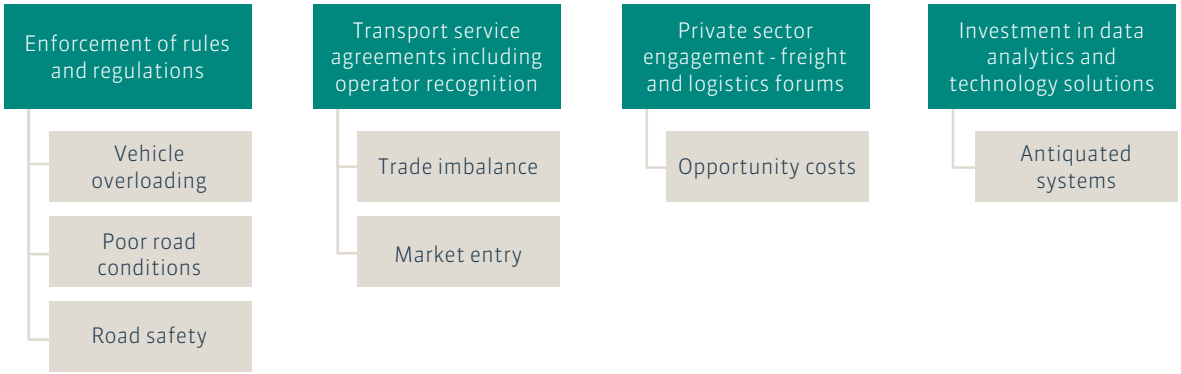
As shown in Table 3.2 the volume of freight being transported by road has fluctuated over the last 15 years but is currently at an all-time high in terms of tonnage and also in terms of road's modal share, which as a general trend has steadily increased since 2000.

Freight transport services can share some of the negative characteristics of public transport services referred to above, notably poor safety practices, sub-optimal maintenance of vehicles, and poor standards of driving. Another characteristic of freight transport services, referred to earlier, is the overloading of vehicles in Malawi. A review of data collected at weighbridges found that 57% of 981 vehicles weight were carrying loads above their Registered Laden Weight (RLW) indications (see Table 3.3), an implication of which is more rapid deterioration of road infrastructure. This is a consequence of the desire to increase profitability of services coupled with the relative shortage of vehicles and the cost of purchase.

3.2.2 Key issues in the trucking industry

The key issues identified have been grouped and key measures to address these are shown in the diagram below.

Figure 3.1 Issues in the commercial road transport sector against proposed key measures



3.3 Rural transport services

Rural public transport (and freight) services are all operated by the private sector and by small businesses and individuals with the exception of CEAR, which is responsible for providing all national rail services. The operators are bound by a regulatory framework and many are a member of minibus or kabaza associations. There are, however, considerable gaps in the governance and regulatory framework in which they operate. The regulations regarding public transport, for example, specify vehicle and driver licensing requirements but do not extend to any specification of service quality, route or fares. The regulations are also not routinely enforced and illegal forms of transport such as matola (travel on vehicles not licensed for passenger service) are fundamental to rural mobility (31% of the rural transport survey respondents travelled by matola, exceeded only by minibus users). The result is a sub-sector characterised by minimal organisation and operating standards, and rural public transport services that can be uncoordinated, unreliable, unsafe, and relatively expensive to use.

The organisation of public transport operators varies between districts. In some, such as Ntchisi, kabazas are not registered or licensed whereas in others kabaza associations regulate where services are provided and assign drivers to serve specific routes. In Salima, for example, licenses cost MWK1,500 and are valid for a month. In return operators are said to receive occasional training, basic safety equipment such as reflective jackets and transport to hospital in the event of a collision.

The extent to which these benefits are realised are, however, said to be limited and kabaza operators have expressed demand for more support post registration.

The Minibus Owner's Association of Malawi (MOAM) was established to represent minibus drivers and improve the quality of the service provided by ensuring that vehicles registered with the association possess a Certificate of Fitness, are covered by adequate insurance and meet other safety requirements. It originally set fares but this function was removed over concerns concerning fair trading. Its role may, however, soon be extended to regulate routes served and to assign related permits to drivers. A number of the association's processes are also being reviewed in the context of criticisms that it's faced in terms of member registration.

Small boats, subject to areas, provide alternative mode of rural transport. Boats serve hard to reach areas in numerous districts but these tend to be particularly irregular and the fares are said to be particularly high. There are no associations or similar for waterway rural transport services, which are also operated by individuals or small companies. In a few instances DCs have operated boat services to serve isolated communities, but when boats have fallen into disrepair they have not been repaired or replaced. There is particularly poor adherence to, and enforcement of, regulations that apply to the sub-sector. This has been attributed in part to the absence of service choice and a shortage of police resources.

Figure 3.2 Kabaza members association meeting

These are supposed to offer benefits including representation, training, safety equipment and hospital transport in the event of a collision.

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

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Malawi National Transport Master Plan

4 Current and forecast demand

Road Sub-Sectoral Plan

4 Current and forecast demand

4.1 Classified network

There is no official up-to-date data available regarding modal share within the road sub-sector, but walking is the dominant mode of transport in both rural and urban areas in Malawi for passenger as well as freight transport (in terms of trips as opposed to volume).

Much freight is transported as headload and the modal share of other forms of transport is relatively low. These other modes, used for both passenger and freight transport, largely comprise: bicycles (personal and kabaza), ox-carts, pick-ups/matolas, motorcycles, minibuses, buses, taxis, boats, trucks and push-carts. In terms of non-walking modes bicycle use is increasing most rapidly, with bicycle trips having increased three-fold between 2010 and 2015.

Vehicle ownership in Malawi is currently relatively low but is forecast to continue to steadily increase. The estimated number of registered vehicles as of October 2014 was 212,540 vehicles[3]. This excludes Government vehicles from the Malawi Defence Force, Malawi Police and Malawi Prison. According to MalTIS, 2014, it was estimated that close to 50% of all registered vehicles are more than 10 years old, whilst this is even higher for minibus taxis (54%), heavy goods vehicles (62%) and buses (66%).

The distribution of vehicles across districts (rural and urban areas) is relatively equal except in the district of Rumphi, where vehicle ownership is considerably lower (an estimated 1,000 vehicles relative to an average of approximately 9,000 per district). On a national level, this averages approximately 15 vehicles per 1,000 population. A forecast, based on an analysis of the relationship between average annual growth in GDP per capital and vehicle ownership in a range of developing and developed countries, suggests that vehicle ownership could grow as per one of the scenarios in Table 4.1, with the most conservative estimate showing a 243% increase over the period 2016 to 2036. The road sector and the framework that guides its development therefore needs to evolve to accommodate this growth, which will continue to grow at an increasing rate post 2036.

It is not only vehicle ownership but vehicle use that is growing. Figure 4.1 reveals that there has been growth in travel demand across the network and across modes over the period 2010 to 2015, and highlights the fact that, despite urbanisation growth in rural areas remains strong and that, already high demands on the rural road network are increasing – this is also reflected in Figure 4.2[4]. The growth in motorised traffic on the M1 was the lowest of all M roads but travel demand on this route remains higher than for any other of Malawi's main roads. In 2010, the only four link segments with traffic more than 10,000 motorised vehicles per day were on the M1, and 20% of all journeys on the road were conducted by bicycle. This highlights the need for the needs of these

Table 4.1 Forecast vehicle ownership

Year	Vehicles (Low)		Vehicles (High)	
	Number	% increase on 2016	Number	% increase on 2016
2016	280,964	-	283,805	-
2021	413,705	47	463,338	63
2026	579,066	106	638,107	125
2031	749,622	167	823,004	190
2036	962,444	243	1,043,301	268

[3] *DRTSS MalTIS, 2014.*
[4] *This data is from traffic counts undertaken on 1,840 links across the network in 2010 and 2015, sourced from the Roads Authority's Road Data Manager (RDM).*

users to be an intrinsic component of this Plan, and particularly in the context of the forecast growth in NMT vehicle use on main roads across the network, as shown in Figure 4.1. Traffic volumes on other roads are lower but remain considerable. Fourteen percent of the most heavily trafficked link segments on main roads, for example, had traffic volumes in excess of 1,000 vehicles per day. On the vast majority of the links, however, growth has started from a low base. This is particularly the case in rural areas, where in 2000, for example, it was estimated that 0.1 motorised vehicle trips were conducted per person per year.

Figure 4.2 reveals that the vast majority of the increase in journeys on the road network is for passenger transport, with freight traffic having declined by 8.5% over the five-year period on all road classes except for district roads, where it increased by 10%. On main roads this passenger transport growth has been driven by non-motorised transport, while on all other road types the main increase has come from journeys by motorised mode.

This plan will consider regional as well as local and domestic journeys as the majority (82%) of the heavy goods vehicle drivers interviewed in Road Side Interviews (RSIs) had origins and destinations outside Malawi. Most international freight movements involved transporting goods between the two sides of Mozambique. Majority of the Mozambiquan registered trucks (57% of those interviewed) were transiting through Malawi between the east and west of Mozambique. Malawian registered vehicles (38%) were also mainly

Figure 4.1 Change in traffic volume by vehicle type and road class between 2010 and 2015

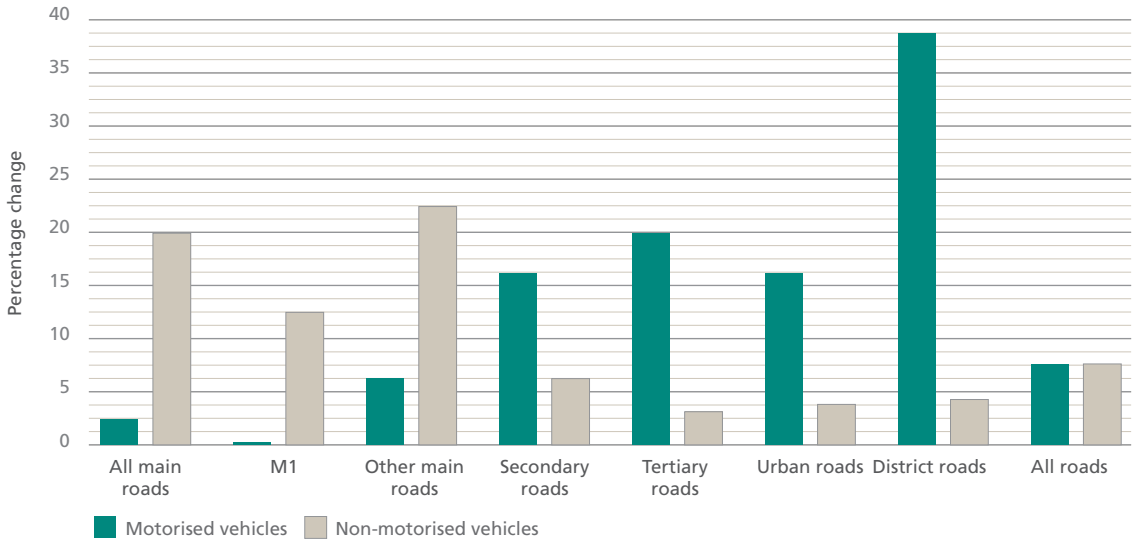
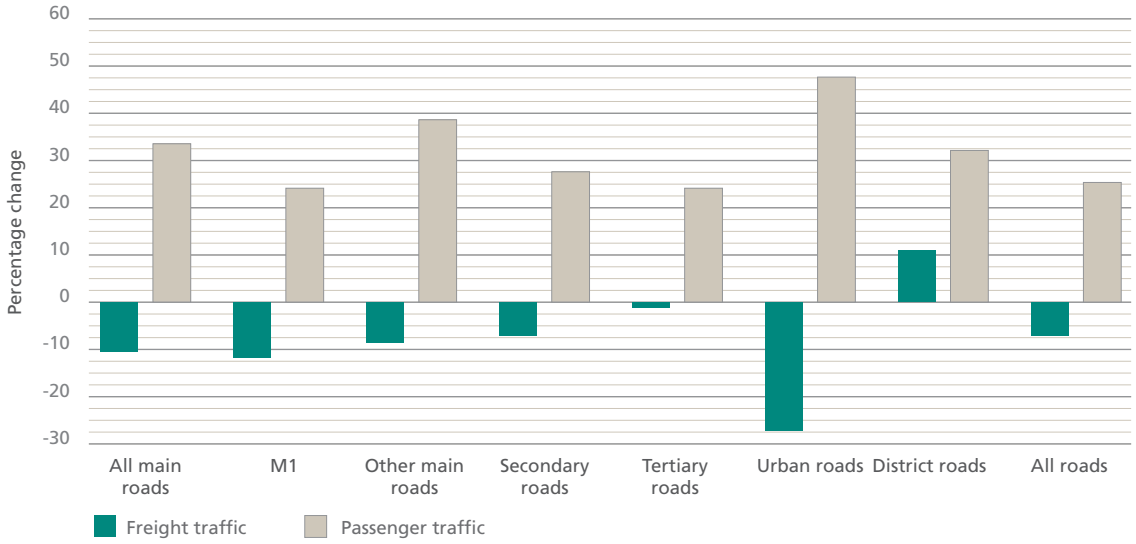


Figure 4.2 Change in traffic volume by journey type and road class between 2010 and 2015



conducting the same journey, with a small minority operating between South Africa and eastern Zambia or between the port of Beria and Zambia (Lusaka). The 5% of South African trucks appear to be mainly in the business of moving goods between eastern and northern Zambia, via Malawi. South African trucks were also observed moving between Lusaka and Dar-es-Salaam, and between Lusaka and Nairobi.

4.2 Rural transport demand

This section starts by summarising the characteristics of rural transport users in Malawi and rural transport modal share. This is followed by an overview of existing rural transport infrastructure and services and a summary of the related issues that the NTMP needs to address. These issues are then considered in the context of the existing strategic framework and the impacts of current rural transport infrastructure and services are summarised.

4.2.1 Rural transport user characteristics

All sub-sectors of the rural transport population travel. Consultation reveals that the nature of transport infrastructure and services limits the ability of mobility impaired citizens to travel, but other characteristics such as gender, income and age influence modal choice but do not necessarily have any bearing on travel demand nor distance travelled. In the rural areas of many districts children as young as five, for example, routinely walk long distances to school.

In terms of freight, many intra-district journeys are made in all rural areas of Malawi on a daily basis but the volume of freight transported on each journey tends to be low. A considerable proportion of these trips are conducted by subsistence farmers who comprise an estimated 80% of the rural population. Subsistence farmers by definition trade a limited amount of produce, which is sold locally, and while some of these farmers also engage in cash crop farming virtually all are smallholders with less than a hectare to cultivate.

4.2.2 Rural transport modal share

Walking is by far the most prevalent mode of transport in rural areas of Malawi. Much freight is transported as headload and the modal share of other forms of transport is relatively low. These other modes, used for both passenger and freight transport, largely comprise: bicycles (personal and kabaza), ox-carts, pick-ups/ matolas, motorcycles, minibuses, buses, taxis, boats, trucks and push-carts. In terms of non-walking modes bicycle use is increasing most rapidly, with bicycle trips having increased three-fold between 2010 and 2015 albeit on the national rather than rural level. There are variations in vehicle ownership and public transport use between districts but there is consensus that both are low in rural areas across the country.

District consultations revealed a lack of awareness about the extent of vehicle ownership. In Rumphi, for example, participant estimates of vehicle ownership amongst small farmers (largely bicycles and ox-carts) ranged from 2% to 10%. There was similarly low awareness about public transport patronage, but a survey conducted in 2000 in five districts in Malawi found that approximately one tenth of a motorised vehicle trip is conducted per person per year (Hine and Rutter, 2000). This estimate was not disputed by officials in the districts visited for this project who provided anecdotal evidence to validate this high, and for some people exclusive, reliance on non-motorised modes. This is largely attributed to the relatively high cost of forms of motorised transport in Malawi and also the condition of parts of the rural transport road network. These two factors are both summarised below.

The cost of vehicle purchase and public transport use is unaffordable for many rural citizens. In consultations it was suggested that a second-hand bicycle, for example, could be purchased for approximately MWK 20,000, and that a new bicycle can cost between MWK 65,000 and MWK 80,000. The need for repairs can also be frequent and an additional cost burden. Six percent of the rural transport survey participants were using a motorised mode on the day because their bikes had broken, a consequence of the quality and age of bicycles purchased and of poor road condition. Ox-carts are similarly unaffordable for most, with cost estimates ranging from 200,000MWK to 300,000MWK depending on quality.

The impact of the relatively high cost of private vehicle ownership is compounded by the fact that Malawi has amongst the highest interest rates in Africa (and the world), which makes it prohibitive for many people to access bank loans.

The inability of the majority of the rural population to afford to use public transport services results in low demand, which has implications for supply thereby further limiting modal choice for those who can afford to use the services (see section 2.4). Respondents of the rural transport survey of motorised transport users conduct identified that an average of less than three one-way trips were taken by motorised transport per month. They estimate that they spend an average of 11% of their income on conducting this relatively limited number of trips. The majority of the 18% of people who estimate spending 20% or more of their income on these trips use the motorised transport to transport farm produce. Indicative charges for transport services are summarised in section 9.4.

In some rural areas poor accessibility also decreases the viability of public transport use and vehicle ownership. Some households and villages, for example, are located on roads or tracks that are too narrow or in too poor condition for forms of motorised transport, and in some cases bicycles, to use (see section 2.2). Access to public transport can also be limited for people living near roads in fair condition. A survey conducted in 2000 found that 30 to 40% of Malawi's rural population had to walk more than 4km, and up to 20kms (to a junction, for example), to be guaranteed a 'reasonable chance' of catching a bus or truck (Hine and Rutter, 2000).

It is important to note that these two issues of affordability and accessibility not only mean that most journeys comprise a significant element of walking but that mobility is impacted. The impacts are felt on an individual level (e.g. children not being able to travel to school), a household level (e.g. subsistence farmers selling their produce at a relatively low price on the roadside as opposed to travelling to a local market,) and on a district level. In Nkhata Bay district, for example, an increase in already high public transport costs is said to have contributed towards a reduction in the number of visitors to the district centre, which has negatively impacted its character and prosperity.

Freight movements within Malawi's rural areas tend to be low volume. An estimated 80% of the rural population consists of subsistence farmers, and while some of these farmers also engage in cash crop farming the vast majority trade a limited amount of produce (Manda and Makowa, 2012). District workshops revealed that this produce is largely transported by headload, walking, bicycles, ox-carts, kabazas and, in some areas, boats. Minibuses, taxis and trucks are also used to transport commodities but research indicates that much of the relatively low income rural population can only afford to use motorised transport for the relatively long-distance transport of crops (Hine and Rutter, 2000). More than half of the motorised vehicle users who participated in the rural transport survey and were transporting produce were travelling by truck with another 28% travelling by minibus, 16% by shared car, and 2% by bus. Those who were transporting produce said that they conduct just under ten trips per month.

4.2.3 Public transport modes and users

The main modes of public transport in rural areas are kabazas, pick-ups/ matolas, minibus, motorcycle, taxi and bus. The rest of this sub-section focuses on the profile of people travelling by motorised modes of rural public transport, which were the focus of the rural transport survey, but district consultations indicate that the nature of kabaza users and journeys is also very similar.

In terms of mode, most of the rural transport survey respondents were travelling by minibus (48%) followed by truck (31%), car (taxi or pick-up) (16%) and bus (5%). The majority of respondents accessed the mode by non-motorised transport, but 35% had to use another motorised mode to reach the public transport service. The range of modes used are listed in Figure 4.3. Almost half of the respondents (44%) said that they would prefer to be able to access the public transport mode from an alternative location with numerous villages proposed.

There is no apparent relationship between modal choice and demographic. The characteristics of the 250 respondents of the rural transport survey are summarised in Figure 4.4.

Figure 4.3 Mode of transport used to access public transport (rural transport survey)

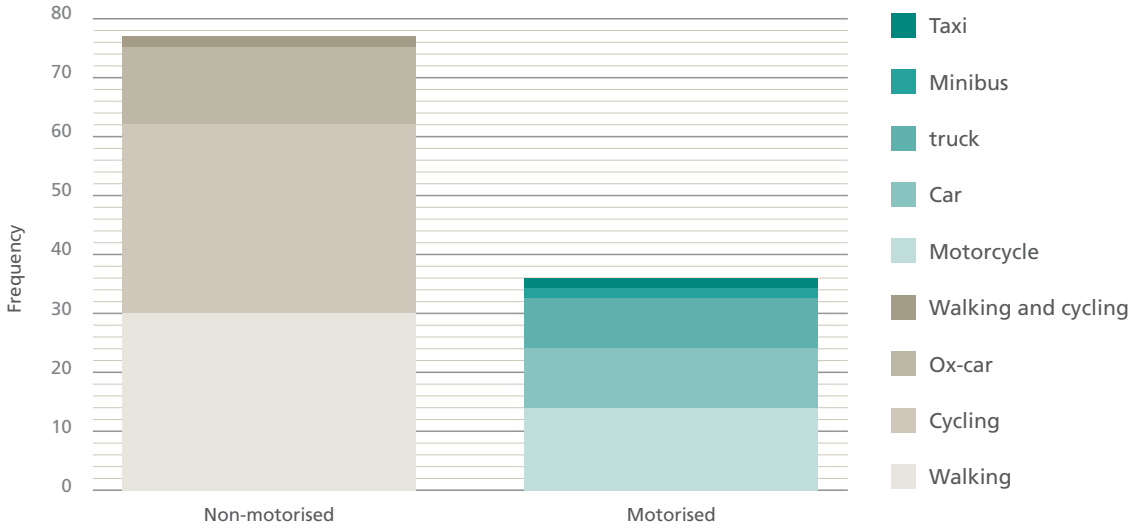
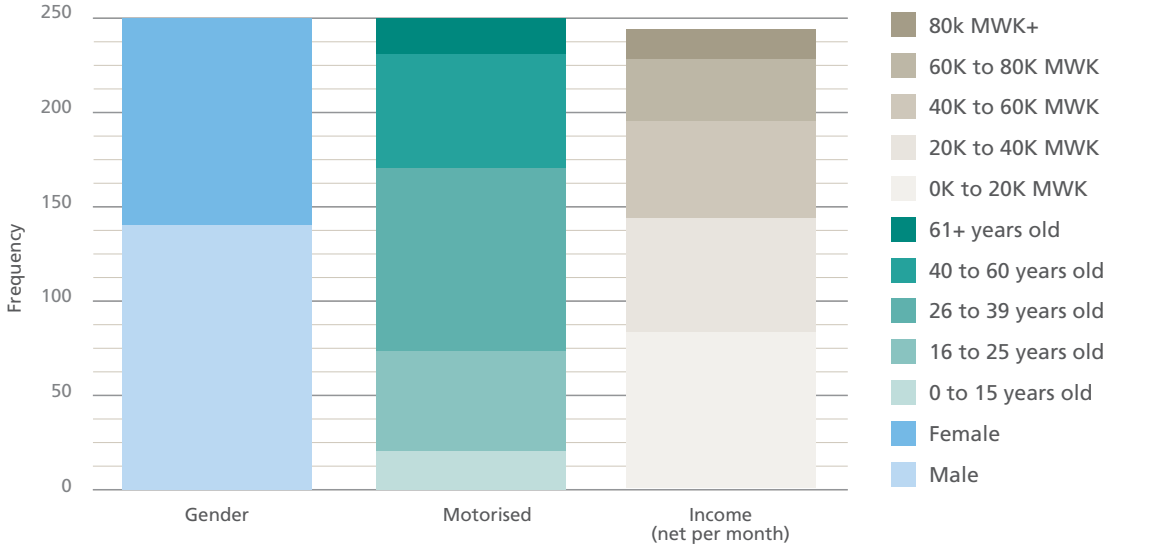
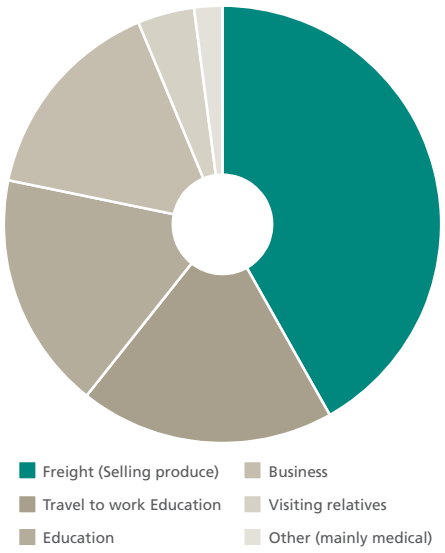


Figure 4.4 Characteristics of users of motorised forms of public transport (rural transport survey)



There was a relatively equal split of male and female travellers and the purpose of the journeys being conducted by both genders (see Figure 4.5) was similar although the differential in the average cost of each trip and average cost per month suggests that men travel longer distances by public transport than women, but that women travel more frequently. Most travellers (86%) were aged between 16 and 60, and all of those aged 15 and under who specified a journey purpose were travelling for education. The majority of respondents (85%) earned less than 40,000 MWK per month.[6]

Figure 4.5 Motorised public transport mode journey purpose (rural transport survey)



[6] *The minimum monthly (net) wage in Malawi is MWK 16,505 (Ministry of Labour, Youth and Manpower Development, 2015).*

The M1 towards Mzuzu

Malawi National Transport Master Plan

5 Current costs of road transport

Road Sub-Sectoral Plan

5 Current costs of road transport

5.1 International transport costs

Transport costs for Malawi's major imports and exports by route were examined. Actual pure transport cost by road is shown in Table 5.1 and Table 5.2 below, for each commodity based on prevalent mode travelled, cargo mode of packaging (i.e. container vs break bulk) and main Malawian origin/destination city. This is based on full transport route from point of domestic production/consumption, through domestic consolidation points by region to international port.

Table 5.1 Road transport costs (production destination to port) – US$ per tonne

Exports	Tobacco		Sugar		Tea		Cotton		Food crops		Food residues	
	2004	2016	2004	2016	2004	2016	2004	2016	2004	2016	2004	2016
Beira	62	138	82	103	44	103	–	84	–	90	–	88
Durban/ Johannesburg	123	233	127	–	67	165	–	245	45	184	–	–

*- Data not available

Table 5.2 Road transport costs (port to destination) - US$ per tonne

Imports	Fuel		Fertiliser		Cement		Wheat	
	2004	2016	2004	2016	2004	2016	2004	2016
Dar es Salaam	141	155	–	137	75	–	–	–
Beira	121	118	–	164	60	108	–	137
Durban	–	–	179	–	–	173	–	145

*- Data not available

5.2 Domestic transport costs

Transport costs for the movement of freight from a central warehouse to selling points across the country or from vendors across the country to warehouses for the main local buyers in the major centres of Blantyre or Lilongwe are shown in Table 5.3.

Table 5.3 Domestic road haulage costs - US$ per tonne-km

	Short Haul	Mid Haul	Long Haul
Average	0.35	0.19	0.14
High	1.4	0.35	0.20
Low	0.25	0.11	0.08
Rainy season uplift factor	25%	40%	60%

Domestic haulage rates, including highest and lowest quotes given by different operators, schemes and routes, are shown in Table 5.4 . While the typical long distance rate per tonne/km in Malawi was around 8 cents in 2016, charges for shorter trips were much higher. This is demonstrated keenly by prices quoted to the study team for tobacco transport and those of the World Food Program particularly.

Of particular note is the change in price during the rainy season – where hauliers were very open regarding the need to increase prices by up to 60% to factor in delays and potential damage to vehicles due to the poor condition of rural roads. This significant price increase is most keenly felt by rural communities, who are those who can absorb the cost the least.

Table 5.4 Comparative domestic road haulage rates – US$ per tonne-km

Company	Commodity	Rate ($/tKm)
ADMARC	Maize	0.072
SFFRFM	Fertiliser	0.086
Export Trading	Fertiliser	0.079
Alliance One	Tobacco (long distance)	0.12
Tobacco Control Commission	Tobacco (medium distance)	0.20
Tobacco Control Commission	Tobacco (short distance)	0.27

5.3 Fuel costs

Fuel is the biggest single cost component in the transport cost breakdown, with fuel spend accounting for between 35% and 70% of the cost of a trip depending on respondent, route travelled and whether operations are focused on the international or domestic market. The fuel price is regulated by the Government and was set at MWK 743.30 per litre for petrol, and diesel at MWK 722.80 in April 2016. This is a significant amount, equivalent of US$1.05 per litre, in a country with GDP per capita of US$362 (WB, 2014).

This cost is composed of a number of factors, including world market price, sea freight premium marker, land import transport cost, levies, duties, and profit margins. 11.5% of the pump price is due to transport costs of fuel itself.

5.4 Rural transport costs

The main modes of public transport that operate in rural areas in Malawi are listed in Table 5.5 along with an indication of the areas that they serve and typical charges levied per km. The details were collected during district consultations with stakeholders including kabaza and minibus association members, but they should be treated with caution as the charges vary considerably in relation to factors including those listed below. Examples of charges for boat services are provided below rather than in the table as these are particularly variable.

The costs of transporting freight by these modes is broadly similar to the cost of passenger travel, although in some districts, such as Thyolo, costs can be set per bag as opposed to distance. The volumes of produce transported are typically low and there are not said to be any fixed charges, but participants at district workshops estimated that additional charges are typically as follows:

- MWK1,000 per bag of maize transported; and
- MWK400 per bag of tobacco.

The average one-way cost per freight trips (not factored by trip length) was MWK 638 and the average for passenger MWK 525, based on the findings of the rural transport survey. The respondents estimated spending an average of MWK 2,990 per month on transport, approximately 9.6% of their income. The relatively high cost of public transport services having been referred to as a mobility constraint across Malawi's districts, this could be a result of trip suppression. The high cost of fuel is the main contributor to high transport costs[7] but there are many other contributory factors. In Malawi, charges for rural transport services can vary on a journey level based on the following:

Table 5.5 Rural passenger transport services, areas served and indicative charges

Mode	Areas served	Average charge per kilometre (MWK)
Rail	A service between Blantyre and Nayuchi is currently the only operational passenger train service	15
Minibus	Primary roads, and in some districts only on paved roads	22
Taxi (often 5 to 8 seater, saloon cars)	Primary roads	22
Bus	Primary roads	22
Pick-ups/ matolas (often open trucks)	Primary and secondary roads, although occasionally tertiary roads when demand may be relatively high (e.g. on market day)	30
Ox-cart	Primary, secondary and tertiary roads	35
Kabaza	Primary, secondary and tertiary roads	60
Motorcycle	Primary and secondary roads	100

- **Road condition**, which has implications for the risk of damage to vehicles, need for spare parts and repair, and the amount of fuel consumed. All stakeholders noted that journeys cost more when travelling on informal roads (for example, a 10km journey by kabaza from Chitipa to Lufita costs MWK300 on a paved road and MWK500 on an unpaved road).
- **Season**, with journeys in the wet season costing more than in the dry, again owing to risk of damage and increased journey times (for example, a 120km journey by minibus from Chitipa to Nythalire costs MWK 3,500 in the dry season and MWK4,000 in the wet season).
- **Likelihood of demand** (for example, a kabaza fare between Salima and the town of Selemani is MWK2,000 for a 32km journey, but the charge increases by MWK1,500 for every km travelled outside this relatively high demand corridor).
- **Topography**, with prices increasing for journeys on roads with relatively high gradients. Nkhata Bay stakeholders, for example, believe that the cost of transport in the district is amongst the highest in the country owing to its topography. A 4km journey from Nkhata Bay to outlying villages, for example, was said to cost approximately MWK200 per km by kabaza, which is considerably above the average for other kabaza journeys as indicated in Table 5.5.
- **Journey speed.** The cost of boat services isn't featured in Table 5.5 but the journey by boat from Nkhata Bay to Likoma was said to cost MWK 6,000 on vehicles with a two to three hour journey time vessel, and MWK 3,500 on boats with an eight hour journey time.

5.5 Rural transport service issues

The rural transport survey responses revealed that almost half of travellers (49%) considered the quality of public transport journeys to be 'poor' (half of the other respondents referred to their journey as being 'satisfactory' and the other half either 'good' or 'excellent'). There was no correlation between vehicle type and reported journey experience, although the 8% of respondents who said that journey comfort was 'excellent' were travelling by minibus or shared car. District consultation and observations reveal that rural public transport vehicles are often in a poor state of repair, ventilation can be poor, services operate over capacity and mandatory provisions (such as lifejackets on boats) are often absent from the relatively uncoordinated private sector services that characterise rural transport service provision. As mentioned above, a regulatory framework does exist but is insufficiently enforced to have the intended impact on journey experience and crucially on safety and the low frequency of services removes customer choice about which vehicles to use.

7 The retail price of petrol in Malawi is the third highest of the 48 countries of Sub-Saharan Africa, exceeded only in South Sudan and Eritrea (GIZ, 2015).

Table 5.6 Approximate fixed costs associated with providing a minibus service [8]

Expense	Cost (MWK)	Unit	Cost/ month (MWK)
Driver salary	15,000	per month	15,000
Conductor/ bus boy	15,000	per month	15,000
Insurance (mandatory)	200,000	per year	16,667
Certificate of fitness*	10,000	per year	833
Vehicle license	15,000	every 5 years	250
Road Payment Service	10,000	per year	833
Route application form	500	per 6 months	83
Subscription to Minibus Owner's Association of Malawi (MOAM)	2,500	per year	208
Malawi Revenue Authority	3,500	3 months	1,167
Association membership and route license	1500	per month	1,500
			51,541

**Older vehicles and/or passenger vehicles are required to obtain COFs every 6 months*

Table 5.7 Approximate variable costs associated with providing a minibus service

Expense	Cost (MWK)	Unit	Cost/ 50km (MWK)
Fuel	815.8	Per litre	3,465
Maintenance costs	5	Per km (approx.)	250
			3,715

In the absence of regulations that specify public transport service quality, vehicle conditions, route and fare, and the lack of enforcement of existing regulations, have contributed towards the provision of relatively unreliable rural public transport services. The limited ability of rural populations to afford public transport has also had a negative impact on the supply. As a result an already highly variable frequency of these services have deteriorated even further. Small pick-ups, for example, only tend to serve villages on community roads on market days when demand is likely to be relatively high, and in many districts minibuses only operate once per day in each direction on main roads (departing in the morning and returning in the afternoon). The reliability of minibus services is further compromised by their tendency to only depart when full. The average waiting time for motorised transport, based on the rural transport survey findings, was 35 minutes with 25% waiting less than 15 minutes and 15% more than an hour. The waiting time for pick-ups (an equal split between car and lorry) was higher than for any other mode. All of the respondents who reported waiting more than an hour for a service travelled by pick-up, as did 81% of those who waited for more than 45 minutes the car.

5.6 Factors affecting transport costs in Malawi

5.6.1 Road conditions

Almost 84% of Malawi's road network is unpaved with either an earth or gravel surface. This includes all of the 9,478km of undesignated community roads and 74% of its classified road network. Using the existing categories tertiary and district roads are the primary means of rural access and on a national level only 0.7% of these are paved.

Domestic road conditions are constraints on local transport, with transporters charging more for hard to reach areas. Maintenance resources are insufficient to ensure that the road network is fully maintained and, as only a small percentage of the whole network is sealed, the majority of the rural population are reliant on roads which are not resilient to climate conditions and are at risk of serious damage during the wet season.

8 These are recurring costs and exclude one-off or less regular expenses, such as minibus purchase, change in minibus ownership (approximately 5,000 MWK), business registration (2,000 MWK), and regional association memberships, which can be approximately 500 MWK.

As road conditions deteriorate, transport costs rise as general quality of transport infrastructure can account for half of the variation in transport costs. Poor infrastructures imply higher transport costs, delays and negative economic consequences and as the majority of Malawi's road network is unpaved rural transport costs are reported to increase as quality of access deteriorates. Indeed variable operating costs can double between smooth and very rough roads, particularly in rainy season with the World Food Program reporting that prices increase by 25%-60% depending on distance and quality of roads.

5.6.2 Location

As a landlocked country, geographical constraints faced by exporters and importers in Malawi are hard to alter. The distance travelled is determined by the chosen port for international shipping, which again is determined by a number of factors, often not at the choice of the exporter/importer. Options to mitigate may include improving regional trade and seeking closer export markets.

5.6.3 Trade imbalance

A greater volume of goods and commodities is imported into Malawi than is exported. This means that trucks bringing goods into Malawi must often return empty. The lack of backloads results in inward transport rates being well in excess of outward rates.

5.6.4 Seasonality and capacity

The agricultural economy of Malawi is highly seasonal in nature and the seasonality of commodities creates oversupply of export products at certain times of the year, creating bottlenecks and driving up transport prices, while at other times, export volumes are significantly lower. Economic seasonality and imbalance of trade means peak export/imports drives up demand and therefore tariffs for transport.

While the Malawian economy is small, leading to relatively low demand in general, these imbalances further impact cost of transport through a trade off in capacity of the transport sector. During peak season demand greatly outstrips supply. However, low volumes at other times of the year do not justify or support a larger sector capacity for the rest of the year.

5.6.5 Fuel

The agricultural bias of the economy, as opposed to a highly industrialised economy, also manifests itself as a lack of demand for key imports, and this is seen most clearly in the cost of fuel in Malawi.

The price of fuel is a major component of transport cost, and its cost profile per litre is dominated by FOB cost, which accounts for 43%. This is mainly due to the increased tariff imposed on the imports by international markets due to the relatively small quantities of fuel purchased.

Comparatively the cost of the actual transport makes up only 11% of final pump price. Therefore for the cost of transport in Malawi to be reduced, larger bulk purchasing of fuel is needed.

5.6.6 Dominance of road freight

International land transport in Malawi is dominated by road based transport. Historically rail was present in Malawi, however lack of investment and external factors lead to its demise, with road become the established mode. However, rail freight has the potential to reduce transport costs significantly, and is doing so to a limited extent. Throughout the data gathering for this report, it was apparent that stakeholders would favour using a rail network, and that in terms of pure transport costs, rail is general cheaper than road and is not subject to the extreme price fluctuations experienced in the road sector in peak season. Published pricing from CEAR, the concessionaire, show that rail prices are fixed, and lower than those of road transporters, and analysis of the key trade commodities done in the previous sections show that significant savings can be realised when shifting mode.

In spite of this - and despite the central and southern regions of Malawi being connected directly to Nacala Port by rail link, which has recently been upgraded by Vale mining company - in 2015 95% of imports and 88% of exports were done by road freight. Road freight came to dominate because of historic inefficiencies, and despite the investment in the Nacala line, operational inefficiencies still exist. Poor port infrastructure, poor rolling stock, no scheduling (this impacts on shipping lines) all result in delays and uncertainty and deter exporters from utilising rail further.

On top of this is the inertia for stakeholders to use the rail network - which because of poor operational history, is not seen as reliable.

5.6.7 Transport industry and competition

Conflicting anecdotal evidence suggests the Malawian transport industry lacks capacity, but at the same time has established monopolies. The industry is characterised by a large number of companies with small fleets, particularly in rural regions, and by a small number of large foreign operators. These foreign operators operate with a higher volume of business, such as operators on the Beira corridor who have strategic access to Northern and Central Mozambique, Zambia, Zimbabwe and Malawi, and therefore have larger, newer, more flexible fleets.

As mentioned previously, fuel cost is a significant proportion of total operating costs, and Malawian fuel is significantly higher than Mozambique and Tanzania, this impacts their competitiveness further. This is in addition to regional pricing such as SADC levies and tolling of foreign trucks throughout the region. As a high proportion of the corridor routes are outside of Malawi, this impacts Malawian operators far more than regional competitors.

To protect the market there are blocks on foreign transporters from working in domestic markets is meant to promote domestic players. However this blocks locals from working internationally, thus limiting their potential market significantly.

5.6.8 Impacts of high transport costs

5.6.8.1 National level economic implications

- High transport costs in Malawi pose a significant barrier to overall development. A recent survey concluded that transport costs are the most important component of trade costs. Radelet and Sachs found empirical evidence that countries with lower transport costs have had faster manufactured export and overall economic growth during the last three decades than countries with higher transport costs. They found that if transport costs double, annual growth would increase at a slower rate of about 1.5%.
- Costs of goods and services are high as nearly all goods being transported into the country are via the network, with limited used of the railway. Transport costs are reportedly much higher than neighbouring countries and Malawi's export performance is constrained by the high cost of trade. A reduction of these costs would allow for an increase in the competitiveness of the country and its potential to grow, thus contributing to the overall objective of poverty reduction.
- Adverse effects of transport costs on small holder farmers will result in a decline in the medium to long term growth of agriculture:
  - Large quantities in farm produce in Malawi is wasted in the remote areas and it is mostly because farmers find it very difficult transporting their farm produce to the market to sell. Roads often do not exist and most remote areas find themselves cut-off from the rest of the network. Because there are no proper storage facilities in the rural areas, a high proportion of perishable goods such as tomatoes, onions, leafy vegetables, tend to rot away in the remote areas (As at 30 September 2016 7% (305,665 metric tonnes of Malawi's national yield was accounted for as a loss).
  - Farm inputs are costly and are made available by agro dealers who are at liberty to sell their products at the prices they desire. Few programmes like the Farmer Input a Subsidy Programme (FISP) and MASAF provides fertiliser and seed inputs to a small proportion of the population. Sometimes these programmes fail to meet their intended target farmers and crop yields are adversely affected.
  - Transport costs are generally high and the condition of feeder roads connecting farms to the main roads is an important factor influencing transport costs. Farmers have no bargaining power and are at the mercy of transporters who determines the price to be paid and when produce is transported. In Mangochi, for example, cell phone credit which is a regulated price set by the telecom companies, is sold for a higher price (a MWK100 voucher is sold at MWK150) due to the cost of transport incurred from moving the products from main centres.

5.6.8.2 Individual level economic implications

- Monetary constraints affect the use of the transport network, especially for business or to get to and from work. The cost of vehicle purchase and public transport use is unaffordable for many rural citizens. In consultations it was suggested that a second-hand bicycle, for example, could be purchased for approximately MWK20,000, and that a new bicycle can cost between MWK65,000 and MWK80,000. The lowest estimate equates to approximately two months' net salary of a typical Malawian civil servant, and the need for repairs can also be frequent and an additional cost burden. Six percent of the rural transport survey participants were using a motorised mode on the day because their bikes had broken, a consequence of the quality and age of bicycles purchased and of poor road condition. Ox-carts are similarly unaffordable for most, with cost estimates ranging from MWK200,000 to MWK300,000 depending on quality. The impact of the relatively high cost of private vehicle ownership is compounded by the fact that Malawi has amongst the highest interest rates in Africa (and the world), which makes it prohibitive for many people to access bank loans.
- Despite some areas being hard to reach, the main modes of public transport in rural areas are kabazas, pick-ups/ matolas, minibus, motorcycle, taxi and bus. In terms of mode, most of the rural transport survey respondents were travelling by minibus (48%) followed by truck (31%), car (taxi or pick-up) (16%) and bus (5%). The majority of respondents accessed the mode by non-motorised transport, but 35% had to use another motorised mode to reach the public transport service.
- The purpose of travel for 250 respondents of the rural transport survey are summarised in Figure 2.4. There was a relatively equal split of male and female travellers and the purpose of the journeys being conducted by both genders was similar although the differential in the average cost of each trip and average cost per month suggests that men travel longer distances by public transport than women, but that women travel more frequently. The majority of respondents (85%) earned less than 40,000 MWK per month.

With regards to rural transport, the following can be noted about the costs within in the districts;

- Shorter distance journeys on earth roads cost more per kilometre than longer journeys on paved roads;
- Changes in weight of the goods can alter the cost and there is no standard transport price mechanism for most produce that is transport through the country. In most cases the driver or owner of the transport dictates the terms and the farmer has no choice but to comply; and
- Where rail is an option, it is always the cheapest option.

Table 5.8 shows a sample of transport costs by mode in three districts.

Table 5.8 Transport costs by mode, selected districts

District	Mode	Distance (km)	Cost (MWK)	Cost / (km)	Additional comment
Dedza	3 Ton truck	20	100,000	5,000	Dedza to Kanyika - Earth road
	3 Ton truck	90	60,000	667	Dedza to Lilongwe - M1 - Paved
Nkhotakota	Minibus or matola	120	4,000	33	NKK to Kasungu - Paved
	Minibus or matola	200	3,000	15	NKK to LLW - Paved
	Kabaza (carrying a person)	1	100	100	One of the lowest costs for Kabaza
Machinga	3 ton truck	34	35,000	1,029	Average cost for carrying 60 x 50kg bags of rice from Nsanama to Liwonde (for example)
	Kabaza		2,500	74	Nsamana to Nyuchi by Kabaza (Cost fluctuate depending on the time of day)
	Car		1,500	44	Nsamana to Nayuchi by car
	Rail		500	15	Nsamana to Nayuchi by rail

Recently widened road
from Blantyre to Zomba

ATKINS

Malawi National Transport Master Plan

6 Road safety

Road Sub-Sectoral Plan

6 **Road safety**

This section is dedicated to road safety owing to the fact that Malawi's roads are amongst the most dangerous in the world and that improving their safety is fundamental to achieving the NTMP objectives.

Malawi has the third highest death rate of the 180 countries monitored by the World Health Organisation (WHO), 35 road traffic deaths per 100,000 of the population, exceeded only in Libya and Thailand (WHO, 2015). In 2014 road collisions resulted in an estimated 1,060 fatalities and 975 injuries and are said to be increasing year on year DRTSS, 2015). This has a considerable socio-economic cost and a direct impact on productivity in rural areas, with most of the causalities being between 25 to 45 years of age (Kasakura, 2015). The Government of Malawi and stakeholders in all of Malawi's districts are aware of both the need and scope to improve both rural and urban road safety. The same factors are responsible for collisions across the country. The main cause is said to be driver behaviour but there are a range of causal factors including road condition, vehicle condition, street furniture (such as lighting and signage), traffic management measures, inadequate training and education, and other road user behaviour.

6.1 **Road collision analysis**

Data for the numbers and severity of road crashes were taken from the draft 2015 Annual Road Accident Report prepared by DRTSS. No other data is available. The data are shown in Table 6.1, along with estimates for the year 2012.

The Traffic Police and DRTSS are routinely accused of under-reporting road accidents. This is because there is a general expectation that the number of serious accidents should significantly exceed the number of fatal accidents, and the number of slight accidents should significantly exceed the number of serious accidents, with damage only accidents constituting the highest proportion of all accidents. The biggest concern with the figures in Table 6.1 is therefore the number of serious injury accidents in the last 3 years, where fewer are recorded than fatal accidents. Whilst reporting in detail on fatal accidents may be flawed, the figures for the number of fatalities (Table 6.1) can be accepted.

Observations in South Africa suggest a ratio of 1:5:20:100 for fatal:serious:slight:damage only. Whilst these figures are not acceptable to be applicable to Malawi, but some form of increasing ratio would be more believable than the raw data.

Table 6.1 Raw road crash data

Accident by severity	Number of accidents	Number of victims	Number of accidents	Number of victims	Number of accidents	Number of accidents	Number of Aacidents	Number of victims*
	2016		2015		2014	2013	2012	
Fatal	962	1,122	888	1,068	813	818		1,050
Serious Injury	565	812	706	982	637	622		
Slight/Minor Injury	1,941	3,098	2,632	4,131	2,407	2,336		
Damage Only	1,921		3,944		3,470	3,580		
Animals	17		24		28	34		
Total	**5,406**	**5,032**	**8,194**	**6,181**	**7,355**	**7,390**		

* Estimated

Limited data from Zambia is shown in Table 6.2. It is highly likely that there is a measure of under-reporting in Zambia as well.

It is proposed that a factor of 15.8 is used to convert fatalities to total accidents, in line with Zambia, along with a ratio of 1:3:5:10 for fatal:serious:slight:damage only accidents. These factors are both applied to derive the number of non-fatal accidents in 2015. For 2013 and 2014, the ratios only are applied to the number of fatal accidents. For 2012, the total number of accidents is derived from the fatal victims and Zambian factor, with the numbers of the individual types accidents all derived from the total and the ratio.

Table 6.2 Road accident data, Zambia

	2013	2008
Fatalities	1,851	1,238
All Accidents	29,118	19,727
Ratio	15.7	15.9

Table 6.3 Revised road crash data, 2016

Accident by severity	Number of accidents	Number of victims	Number of accidents	Number of victims	Number of accidents	Number of accidents	Number of accidents	Number of victims*
	2016		2015		2014	2013	2012	
Fatal	962	1,122	888	1,068	813	818	873	1,050
Serious Injury	2,886	3,366	2664	3,204	2439	2454	2619	950
Slight/Minor Injury	4,810	5,610	4440	5,304	4065	4090	4366	4,000
Damage Only	9,620		8880		8130	8180	8732	
Total	**18,278**	**10,098**	**16,872**	**9,612**	**15,447**	**15,542**	**16,590**	

* Estimated

This section shows, using 2016 data, the descriptive statistics of the contributing factors to road accidents that shows the occurrence of accidents based on categories.

Figure 6.1 below shows the comparative data for road crash injuries in 2016. 52.6% of the crashes resulted in no injuries, 26.3% resulted in slight injuries; 15.8% in serious injuries; and 5.3% in fatalities.

Figure 6.1 Severity of road crashes, 2016

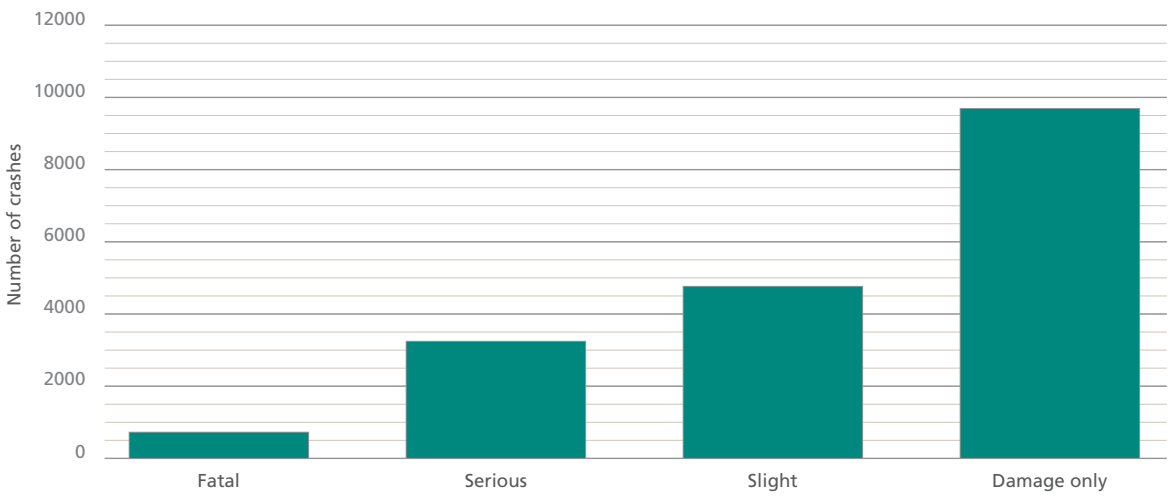


Figure 6.2 shows the relative contribution of males and females towards road accidents. Bitew (2002) describes that 80 – 90% of road traffic accidents are attributed to the fault of drivers, whose majority are male drivers. The table confirms that 81% of the victims of serious and fatal accidents are male and the remaining 19% are female. 82% of the victims of fatal accidents are male and 18% are female; and 80% of the serious accident victims are male and 20% female.

Figure 6.2 Gender of road crash victims, 2016

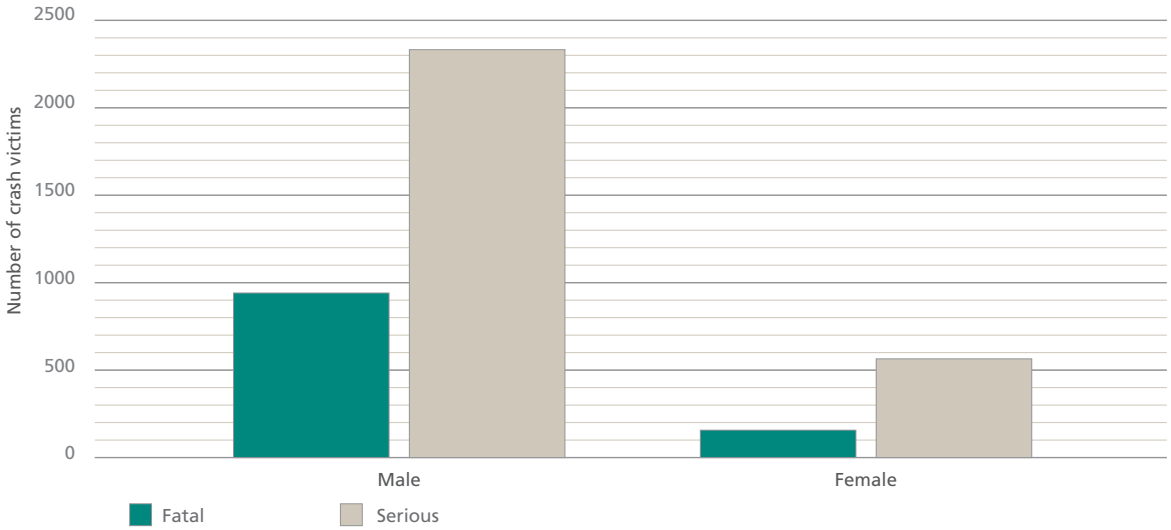


Figure 6.3 Age breakdown of road crash victims, 2016

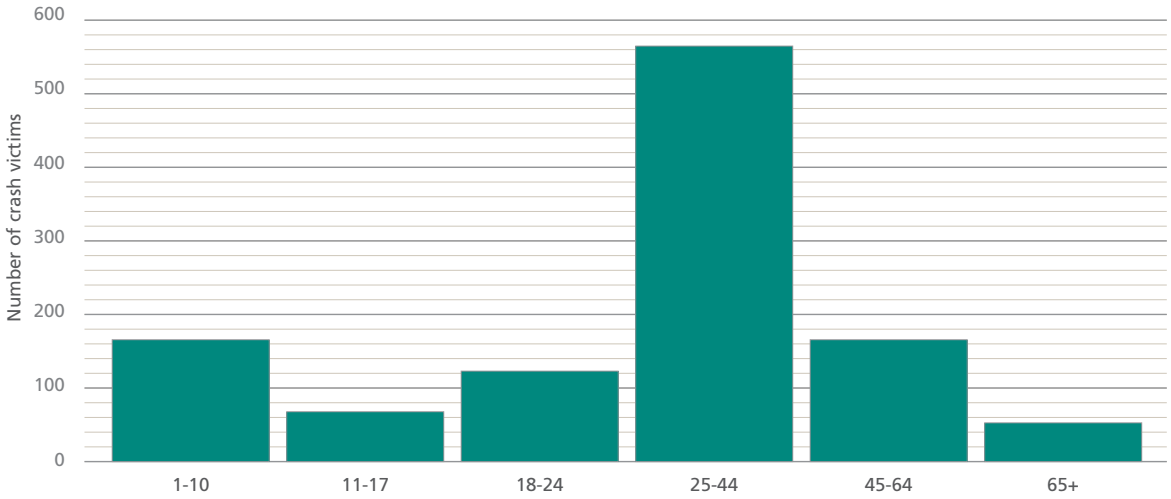


Figure 6.3 shows the distribution of age of the victims of road accidents in Malawi. Around 9%, 5%, 15% 58%,10%,and 2% of the reported casualties have an age of 1 – 10, 11- 17, 18 – 24, 25 – 44, 45- 64, >65 respectively. The most victims from road accidents (fatal, serious, and minor) are the highest in the age category of 25-44 and start reducing after that age. It also shows that within all age categories, the prevalence of minor injuries are the highest compared to the two other types of injuries.

Figure 6.4 below shows the distribution of fatal accidents by regions of occurrence, consequently entailing the distribution of costs of road accidents, holding other factors constant. The figure shows that frequency of accidents is higher in the central and southern region compared to the northern and eastern regions.

Figure 6.4 Fatalities by region

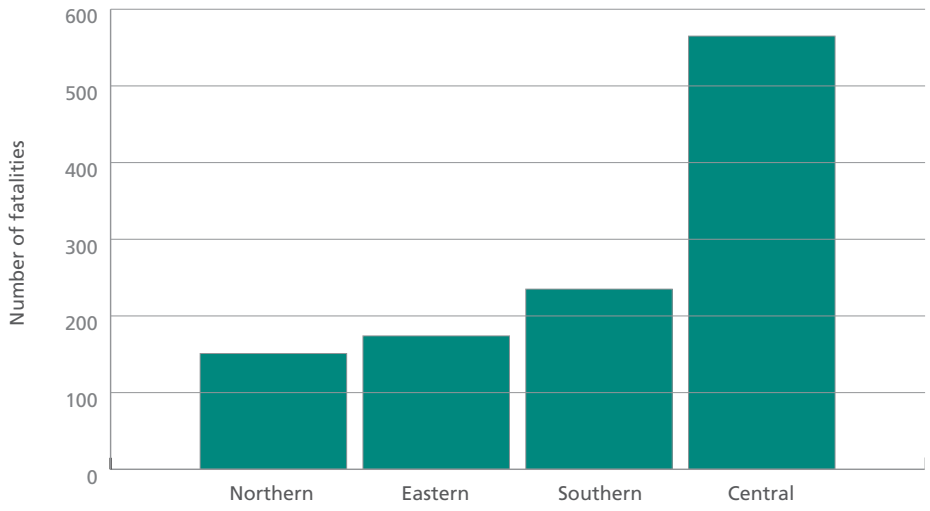
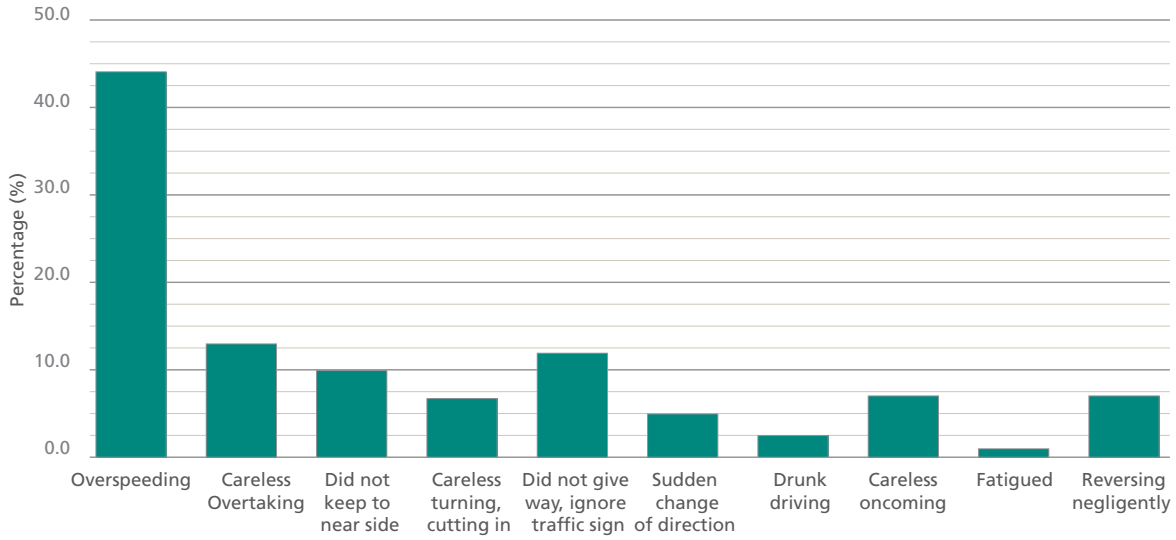


Figure 6.5 shows the contributory factors to accidents in Malawi in 2015 by driver behaviour. Over-speeding continues to be the major contributing factor to road accidents in Malawi.

Figure 6.5 Major causes of road accidents, 2015



6.2 Method for estimating the cost of road crashes

6.2.1 Approaches to costing crashes

Cost-benefit analysis of transport schemes has a long history in developed countries, particularly as a means of allocating scarce resources and as a method for ranking the economic viability of alternative schemes. Road investment programs typically produce benefits mainly composed of time savings and crash and casualty reduction. Monetary values of these benefits are required in order that costs and benefits can be compared in a common currency.

The International Road Assessment Programme (IRAP) provides methods for valuing life and injuries caused by road crashes. They argue that what is being valued is the benefit of an increase in safety or a reduction in risk. The value of statistical life is the level of investment that can be justified for the saving of one life. It is the valuation of a change in risk such that one life will be saved, rather than the valuation of the worth of a life of a specific individual.

One question to be addressed in determining values for use in a range of countries is whether it is appropriate to use different values depending on the level of income. Or should saving a life in a low-income country be

afforded a lower value than in a high-income country? An underlying principle of economic theory is that the worth of something is determined by the price that people are prepared to pay for it. In essence safety is a commodity like anything else in that achieving a reduction in risk requires expenditure, that is: a trade-off between wealth and the desired level of safety.

The IRAP states that whatever method is used to value life, estimates of the value of statistical life are heavily influenced by income. A study of valuation in a range of European countries (COST 313 1993) found that about 40% of the variation between fatality values in the different countries could be accounted for by variation in GDP per capita (Alfaro, Chapuis and Fabre, 1994).

Two main methods have been developed to value the benefit of prevention of a road crash fatality: the Human Capital or Lost Output method and the Willingness-to-pay (WTP) method. Experience in high income countries has shown that empirical estimation of values for the prevention of injury requires considerable care in order to avoid bias, and usually costly survey methods.

In the Human Capital or Lost Output method, death is valued in accordance with the economic impact. The main component in this ex-post approach is the discounted present value of the victim's future output forgone due to death. To this are added market costs such as cost of medical treatment, and for crash costs as opposed to casualty costs, administration costs, and property damage value are included. This approach has clear disadvantages, as it focuses only on the economic effects of the loss of life and does not account for the value and enjoyment of life forgone.

This method underestimates the true value of prevention of road crashes and will produce very significantly lower values than an ex-ante estimate based on WTP. As a partial correction for this shortcoming, a "pain, grief and suffering" component is sometimes added that is intended to represent "human cost". Although this increases the value derived, it still results in a valuation that is generally much lower than values derived from the WTP method, and the human cost component is usually arbitrarily determined.

The WTP approach consists of estimating the value that individuals attach to safety improvement by estimating the amount of money that individuals would be prepared to pay to reduce the risk of loss of life. This ex-ante approach involves some assessment of risk and the willingness of individuals to commit resources in exchange for reducing this risk to an acceptable level. This trade-off between risk and economic resources, measured in terms of the marginal rate of substitution of wealth for risk of death or injury, accords with the principle that public sector allocative decisions should be based on the preferences of those who will be affected by the decision concerned. Estimates of WTP to prevent road crash risk are generally based on surveys designed to ascertain the amount of money that individual's say that they would pay to reduce the risk of loss of life.

Both revealed preference estimates, derived from actual purchases of risk reduction devices such as airbags, and stated preference estimates from hypothetical choices determined by questionnaires have been used. Although theoretically sound, there are practical problems with obtaining precise estimates of individual WTP for risk reduction. The willingness to pay to avoid a lost statistical life is influenced by context effect (seriousness of a road crash) and scale effects (the number of casualties).

However, despite the difficulties associated with accurate estimation of individual Willingness-to-Pay (WTP) it is generally accepted as the most valid method for assessment of the value of prevention of road risk. The 'European Conference of Ministers of Transport (ECMT) in October 2000 concluded that WTP is the preferred methodology as the Human Capital approach is not conceptually sound. It is recommended that a programme of surveys is devised in order that a WTP approach can be adopted in Malawi in the future.

6.2.2 **Value of statistical life**

IRAP also proposed an alternative approach which has been investigated that explores the practicality of deriving a relatively simple "rule of thumb" drawing on available data and results from both WTP and Human Capital studies from a range of countries. This starts from the hypothesis that the level of income in a country is a primary determinate of the value

of statistical life. This is the case for values based on the Human Capital approach, but is also valid for WTP values as willingness to pay is influenced by ability to pay.

IRAP collected data for a range of developed and developing countries and ratios of Value of Statistical Life (VSL) to GDP per capita were calculated. For developed countries, the ratio of the Value of Statistical Life to per capita GDP varies between 42 and 86 with a mean and median of 63, using a mix of Human Capital and WTP approaches.

For developing countries, the majority of the values were based on the Human Capital approach and therefore the values are likely to be much lower than values derived from a WTP approach. The ratio of Value of Statistical Life to per capita GDP ranges between 14 and 62 with a mean of 42 and a median of 40. It is clear that the developed countries' ratios tend to be higher particularly when they are based on a Willingness-to-pay approach.

6.2.3 Value of statistical injury

IRAP also devised a method that could be used to estimate the value of serious injury in developing countries. This considers the relationship between fatal and serious injury values. This would ideally need to be adjusted to reflect the distribution of injuries within the serious category in each country.

The distribution of severity in a country will also be affected by the modal split of travel, so that countries with higher proportions of pedestrians, bicyclists and motorcyclists will tend to have injury distributions that are weighted towards more severe injuries. IRAP examined the relationship between the value of statistical life and the value assigned to a serious injury in eight developed countries, and found that the ratio of VSI to VSL was in a range of 0.08 to 0.22 with an average of 0.15, and all but one value within one standard deviation of the mean. Since the above values are ratios, the issue of income in the developed countries is removed, and the values could be equally applicable in developing countries.

In this report a Human Capital approach has been adopted. It is articulated to reflect the data available in Malawi. The results are then compared to values of the cost of road crashes that might be obtained by the IRAP approach.

The primary method of estimated costs is based on the principle of compensation. This approach is entirely financial, and is restricted to payments that individuals, families or relatives receive as a result of persons being victims of road crashes. Such compensation, by and large based on the premise of a loss in productivity, does not value any losses to the state through, for example, losses in tax payments, but these can be considered transfer payments, and hence included in the overall compensation sum. The study was not able to assess the costs of damage to road infrastructure as a result of crashes, but these are expected to be relatively insignificant in comparison to compensation costs.

In this paper, the costs of road accidents are divided into two parts: personal-injury accidents and damage only accidents. Personal-injury accidents are accidents that not only result in the damage of vehicle(s) or property, but also involve the injury or death of people. Furthermore, personal-injury accidents involve three sub types of accidents, namely, fatal (where loss of life occurs), serious (where there are no deaths but one or more persons are seriously injured[9]), and minor (where there are no deaths or serious injuries but a person is slightly injured such as a cut, sprain or bruise). A damage only accident, occurs only when there has been damage to a vehicle(s) and/or property.

6.2.4 Human casualty costs

One method of assessing the costs of human casualties would be to review the costs borne by heath care providers, and health insurance companies as result of road crashes. However, data are sparse, insufficiently detailed, and often too personalised for use in this study.

As an alternative, the study used the results of legal claims in the form of compensations made by victims in the court of law. Therefore, the method used to calculate the human casualty costs was divided into two parts depending on the severity of accidents: 1) Fatal injuries; and 2) Serious injuries. These costs were derived from the loss of output or productivity respectively, derived from average expected life expectancy, minimum wage, age of deceased and income of the individual.

[9] *A serious injury is classified as one for which a patient is detained in hospital.*

6.2.5 Fatal injuries

For fatal injuries all compensation costs incurred by individuals and others as a result of fatal accidents are computed. The awards caused by death are divided into two parts: a) Awards for loss of expectation of life; and b) Awards for loss of dependency.

The factors in determining the awards for loss of expectation of life include the age of the deceased and the stability of exchange rate of the country (taking account of devaluation). The second category of awards are those that cater for the loss of dependency, being the loss of support to other people as a result of the death of an individual.

The factors in determining the awards for loss of dependency are

- Age of the individual;
- Average life expectancy; and
- Occupation of the deceased.

The computation is shown in equation below:

Award = (wage * 12 * Multiplier * ⅔)

The multiplier is obtained from the remaining lifespan of the individual obtained from the difference between the age of death and the life expectancy in Malawi. It is assumed that two-thirds of an individual's earnings are disseminated as support to other individuals.

6.2.6 Serious injuries

For serious injuries, all the compensation costs incurred as a result of permanent disability caused by road accidents are computed. The awards as compensation to serious injuries are divided into two parts: 1) Awards for loss of earnings and earning capacity; 2) Awards for pain and suffering, loss of amenities of life and disfigurement.

The factors in determining the awards for loss of earnings and earning capacity are:

- the age of the injured;
- the average life expectancy;
- the occupation of the injured; and
- the type of injury suffered.

Awards for pain and suffering are affected by the following factors:

- whether the person is in pain or suffering;
- whether there is any loss of amenities of life; and
- whether there is any disfigurement.

6.2.7 Recent trends

In the first quarter of 2017, there were 538 fatalities from 201 road accidents, an increase by 166.3% compared to the same period in 2016. This increase is unprecedented and emphasises the need for drastic measures to address this trend.

6.2.8 Factors affecting road safety in Malawi

High accident rates in Malawi is a consequence of a number of factors including, but not limited to, road condition, road user behaviour and lack of education, inadequate traffic management facilities, lack of visibility after dark. The same factors are responsible for collisions across the country. These include:

- **Road condition**, with poor road condition presenting hazards, such as potholes, and effectively reducing capacity thereby increasing potential for conflict;
- **Inadequate road surfacing and profile** with geometrics and slippery surfaces compromising safety;
- **Carriageway width** and space allocated to non-motorised transport users, which is frequently insufficient to accommodate traffic volumes and the range of road users;
- **Absence of, or faded or vandalised, road markings and road signs**, which are required to guide and enforce the behaviour of both non- and motorised transport users;
- **Roadside maintenance** with factors including infrequent grass cutting operations on reserves reducing visibility;
- **Vehicle condition**, which tends to be poor owing to the high cost of vehicle ownership and use;
- **Visibility after dark** (contributing factors include the lack of street lights, both physical and in operation, and limited use of reflectors on vehicles);
- **Relatively limited implementation of traffic calming measures**, such as speed humps;
- **Road user behaviour** including walking and driving under the influence of alcohol and speeding;
- **Perceptions and attitudes** of all road users towards road safety. Road users in rural areas where volumes of motorised transport tend to be low are said to be particularly dismissive of the risk and familiarity with traffic regulations is low;

- **Unsupervised livestock,** which intrude on the carriageway;
- **Inadequate enforcement of the Road Traffic Act**, which can be attributed to factors including:
  - Failure to equip districts with equipment to support enforcement of traffic regulations;
  - Resource constraints that prevent some traffic law enforcement officers from being able to prioritise road safety issues; and
  - Corruption, with some officials collaborating with those breaking regulations (for example regarding access to false driving licenses).
- **Ease of access to false documentation**, including the ready availability of false vehicle roadworthiness certification and false driving licenses;
- **Inadequate education and training**, specifically regarding:
  - Driver training, including amongst kabaza and minibus association members, who are not always offered, and do not always attend, promised training;
  - Hazard perception (this is a particular problem on primary roads where drivers have a sense of ownership and pedestrians a tendency to hold conversations on the carriageway); and
  - Road safety and traffic regulation awareness raising activities, which tend to be infrequent;
- The large number of stakeholders and administrations who have a role to play in improving road safety and who need to co-ordinate to achieve optimal impact.

6.3 Costs of road crashes

6.3.1 Fatal and serious accident compensation

Total compensation awards made by Malawian courts in the period 2000 to 2012 for fatal and serious road accidents are shown in Table 6.4.

Table 6.4 Compensation awards for road accidents

Year	Compensation (MWK)	
	Fatal	Serious
2000	200,000	
2001	440,000	152,000
2002	286,000	880,000
2003	1,408,000	510,000
2004	4,550,000	1,910,000
2005	2,022,653	2,218,016
2006	59,389,421	
2007		5,960,000
2008	5,926,624	100,800
2009	19,675,012	12,120,000
2010	3,932,931	1,344,000
2011	11,558,134	6,235,445
2012	89,112,701	5,853,971

Using data for 2012, the average compensation payment for a fatal injury was MWK 7,426,000 million, and for a serious injury MWK 277,000. Assuming the cost of slight injuries, for health care and temporary loss of productivity is 25% of a serious injury, the cost of such injury is estimated to be MWK 69,000. In 2012, the Kwacha/US$ exchange rate averaged 250. Table 6.5 lists the costs used in the overall cost assessment.

Table 6.5 Human costs of road crash by severity

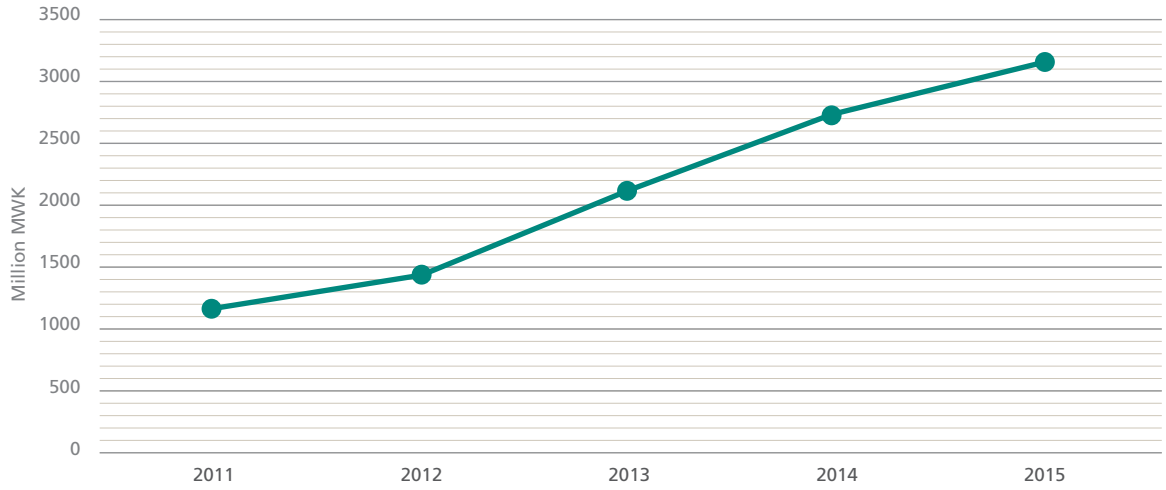
Severity	Cost (MWK)	Cost (US$)
Fatal	7,426,000	29,704
Serious	277,000	1,108
Slight	69,000	277

6.3.2 Vehicle damage

This section estimates the cost of road accidents as a result of damage to vehicles. This is proxied by the costs incurred by insurance companies as compensation for repaired or written-off vehicles (Appendix A).

Figure 6.6 below shows the trend of these costs over the period from 2011 to 2015. The figure shows that the costs of repair has been increasing significantly over time. The average cost of damage per vehicle in 2012 to this company was MWK 217,000 (US$868).

Figure 6.6 Vehicle damage claims settled by Nico General, 2011 to 2015



6.3.3 Public sector costs

Police and other public sector attendance at accident scenes, and follow up administration costs have been quantified using the following assumptions. Two officers are assumed to attend the scene, with a total of two days each spent on investigation and reporting, plus fuel costs. The assumed cost per crash is MWK40,000 (US$160).

6.3.4 Total costs

The total costs of crashes in Malawi was calculated using 2012 cost data, and 2015 crash information. The US$ costs are assumed to remain constant between 2012 and 2016.

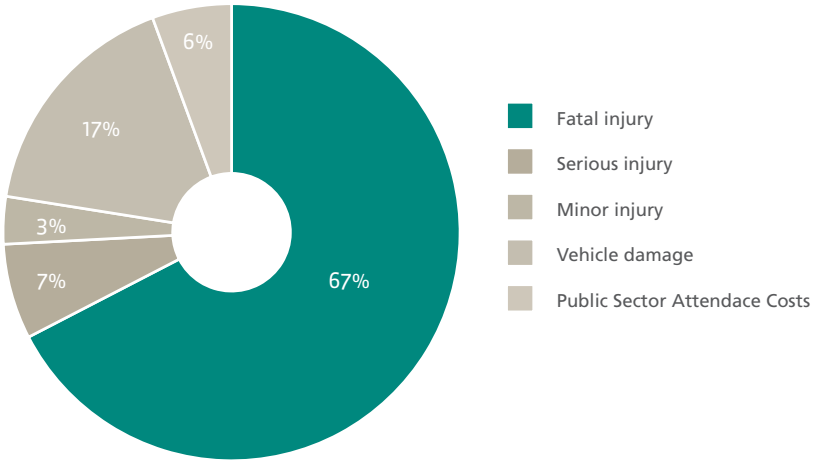
Table 6.6 shows average and total compensation wards calculated for the year 2012. Malawi Kwacha costs were converted to US Dollars using an exchange rate of US$1 = MWK250.

Table 6.6 Total financial costs of road accidents in Malawi, 2016

Cost component	Cost (US$)	Estimated number of incidents	Total cost (US$)
Fatal Injuries	29,704	1,122	33,328,148
Serious Injuries	1,108	3,366	3,731,184
Slight Injuries	277	5,610	1,554,660
Damage only	868	9,620	8,347,851
Public Sector	160	18,278	2,924,480
Total			**49,886,324**

Figure 6.7 shows the breakdown of costs of accidents. Two thirds of the total cost is accounted for by fatalities. Injuries account for only 10.6% of total costs. This appears low in comparison to the cost of vehicle damage (16.7%).

Figure 6.7 Breakdown of road accident costs, 2016



6.3.5 Costs relative to GDP

In 2016, the GDP of Malawi was estimated to be US$6.4 Billion. The cost of road accidents was 0.78% of GDP in 2016. This appears slightly low when reviewed against the literature. Possible reasons are:

1. Whilst the awards from courts for fatal injuries have been made for some years, it is possible that in the future lawyers will argue for costs to be increased, and/or for the generally accepted formula to be amended in favour of the deceased to reflect society's increasing valuation of human life.
2. Insurance companies naturally wish to conserve profits and will seek to minimise payments to policy holders. The compensation payments must therefore be considered to be always less than the actual costs of the injuries sustained.
3. There are been a few recent calculations from first principles of the costs of road accidents in Africa. Many countries cite or have cited an assumption that accidents cost around 1-3% of GDP.

An alternative method of calculation is based on the VSL and VSI as set out in section 6.2, and is shown in Table 6.7. The total cost is very similar to that shown in Table 6.6.

Table 6.7 Alternative 1: Estimate of financial costs of road accidents in Malawi, 2016

Cost component	Cost (US$)	Source	Estimated number of incidents	Total Cost (US$)
Fatal Injuries	15,624	VSL = 42 x GDP per capita	1,122	17,530,183
Serious Injuries	2,344	VSL x 0.15	3,366	7,888,582
Slight Injuries	2,344	VSL x 0.15	5,610	13,147,637
Damage only	868	As Table 6.4	9,620	8,347,851
Public Sector	160	As Table 6.4	18,278	2,924,480
Total				**49,838,733**

Whilst the costs of injuries in Table 6.7 are higher than those in Table 6.6, the cost of fatalities is lower. If the figure for the cost of fatality determined by the Malawian courts is used, and the VSI's constructed from this, the resultant costs are shown in Table 6.8.

Table 6.8 Alternative 2: Estimate of financial costs of road accidents in Malawi, 2016

Cost component	Cost (US$)	Source	Estimated number of incidents	Total cost (US$)
Fatal Injuries	29,704	Table 5.3	1,122	33,328,148
Serious Injuries	4,456	VSL x 0.15	3,366	14,997,667
Slight Injuries	4,456	VSL x 0.15	5,610	24,996,111
Damage only	868	As Table 6.4	9,620	8,347,851
Public Sector	160	As Table 6.4	18,278	2,924,480
Total				**84,594,257**

The costs in Table 6.7 represent 1.32% of GDP. Using the ratios of incidents noted in Table 6.4, a final alternative assessment of costs was prepared, as shown in Table 6.8.

The costs in Table 6.8 represent 3.17% of GDP. However, the number of incidents represents 0.6 per registered vehicle, which intuitively appears high. A summary of cost estimates is shown in Table 6.9.

Table 6.9 Alternative 3: Estimate of financial costs of road accidents in Malawi, 2016

Cost component	Cost (US$)	Source	Estimated number of incidents	Total cost (US$)
Fatal Injuries	15,624	VSL=42 x GDP per capita	1,122	17,530,183
Serious Injuries	2,344	VSL x 0.15	5,610	13,147,637
Slight Injuries	2,344	VSL x 0.15	22,440	52,590,548
Damage only	868	As Table 6.4	112,200	97,362,672
Public Sector	160	As Table 6.4	141,372	22,619,520
Total				**203,250,560**

Table 6.10 Summary of cost of road crashes as % of GDP

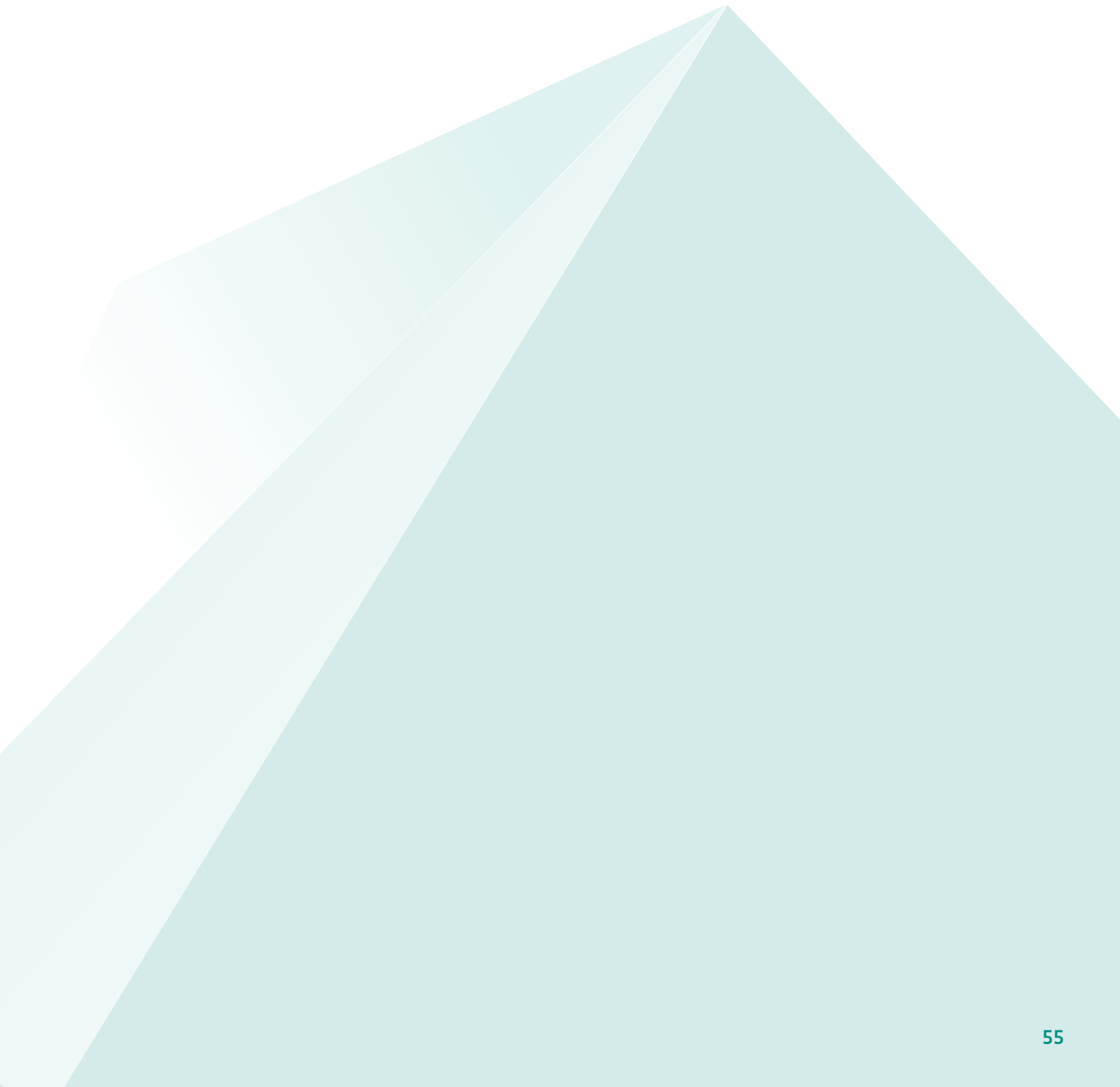
Source	Cost of road crashes as % of GDP	Comment
Table 6.6	0.77	Malawian costs, with number of accidents uprated to an equivalent Zambian total
Table 6.7	0.77	Costs (VSL and VSI) generated from GDP, with number of accidents uprated to an equivalent Zambian total
Table 6.8	1.32	Fatal costs from Malawian data, VSI's from GDP and number of accidents uprated to an equivalent Zambian total
Table 6.9	3.17	Costs (VSL and VSI) generated from GDP, with number of accidents uprated to an equivalent South African total

6.3.6 Social implications of road safety issues

Accidents happen in a fraction of a second but their consequences may last for days, months, years or the rest of life. A large number of road users involved in traffic crashes recover from their injuries, but some of them never recover fully and suffer from some kind of permanent disability. In Malawi, there is no data to show how those who survive a road crash are treated in hospitals as in-patients or out-patients or whether they are forced to take a sick leave from work. In addition to loss of life or reduced quality of life, road accidents carry many other consequences to the survivors such as legal implications, economic burden, home and vehicle adaptations as well as psychological consequences.

When discussing the long-term effects or outcome of injuries it is also appropriate to consider the definitions given by WHO regarding impairment, disability and handicap. Impairment is defined as a demonstrable anatomical loss or damage (e.g. restricted movement of a joint). Disability is the functional limitation caused by this impairment, interfering with something the person wishes to achieve. Handicap depends on the environment, where different adjustments or adjuncts can reduce or overcome the disability (WHO, 1986). Different injuries may cause similar impairments. Restriction of movement may result from injuries to the musculoskeletal system, but neurological injuries may cause exactly the same result. Persistent pain may cause various difficulties in living a normal life, which are not easily quantified. It is therefore difficult to find a single scale or score that adequately describes health (or the loss of it) and fits all possible conditions.

A proportion of persons being involved in transport-related incidents develop psychological symptoms. In its most severe form this is described as PTSD (post-traumatic stress disorder) and can cause a high grade of impairment in everyday life for those affected. The incidence does not seem to be correlated with the severity of the actual injury, but rather with the perceived subjective threat to life. Several studies have shown that traffic accidents are a common cause of PTSD. Ursano et al, (1999) and Bryant et al (2004) found a prevalence of 25% PTSD three months and 18% six months after the traffic accident. PTSD seems to be an important psychological consequence of accidents with motorised vehicles.



Heavy truck through Lilongwe

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Malawi National Transport Master Plan

7 Social inclusivity of road transport

Road Sub-Sectoral Plan

7 Social inclusivity of road transport

Social inclusion is perhaps best explained in terms of its opposite – social exclusion. To be socially excluded is to be unable to access the opportunities in life that the more privileged people in Malawian society take for granted and that all citizens have a rightful access to.

Transport, public and private, has a key role to play in tackling social exclusion by providing people with the means to get to the jobs, services and social networks to which everyone should be entitled. Road transport is the primary mode of travel in Malawi and as such it plays a pivotal role in ensuring social inclusion and is a key concern that the NTMP has been developed to address.

The provision of transport alone cannot solve the complex pattern of circumstances that lead to social exclusion in Malawi, however, it is a vital tool in ensuring people have the means to be connected to the wider world and the opportunities it has to offer. These issues can also be considered in terms of social mobility. Social mobility describes the movement, or opportunities for movement, between different social groups and the advantages and disadvantages that go with this in terms of income, security of employment, opportunities for advancement and so on.

In order to successfully connect people to opportunities, the Malawi transport sector should ideally fulfil the four criteria outlined in Figure 7.1.

Figure 7.1 Characteristics of a socially inclusive transport system

Source: DfT (2008) Delivering a Sustainable Transport System.

7.1 Social implications of road conditions in Malawi

A lack of reliable infrastructure, accessible networks and public transport which fulfil these four criteria can leave people stranded and cut off from opportunities and therefore vulnerable to social exclusion. Groups of people at particular risk of being excluded in this way include:

- People without a car – the vast majority of all households do not have access to a car and must rely primarily on public transport to get around.
- People on a low income - the lack of access to car is paramount for the people at the lower end of the income scale. Affordability even affect their access to other motorised vehicle i.e. minibuses, let alone car. It can be acutely observed in the rural areas.
- Women in general are less independent financially and thus costs incurred in terms of transport have a greater impact upon them.
- People living on isolated housing estates or in deprived areas where it is not profitable for bus operators to run services.
- People with physical or sensory impairments, chronic health conditions, mental health support needs or learning disabilities who may need extra support or design features to be able to use public transport effectively. The 2008 population Census in Malawi indicated that the number of people with disabilities in Malawi's districts has grown up by 30% in the twenty-year period (1983 to 2003). The Census revealed that 4.18% or 498,000 persons of the population consist of persons with disabilities, 51% being males and 48% females and that 90% of them live in rural areas with little or no access to rehabilitation service.

There are presently no specialized transport services for people with disabilities available in the country. People with disabilities continue to remain largely 'invisible' and unable to contribute to, or benefit from, the services and commercial activities available to able bodied citizens.

There are indications that the prevalence of a negative attitude amongst the general public and incidences of harassment are a greater barrier to mobility and transport for females.

- Older people who may no longer be fit, or feel able, to drive or be able to afford to run a car.
- Children and young people for whom public transport is a prime means of getting around independently, particularly where the journey is not suitable for walking or cycling.
- People living in remote rural areas without access to a car.

It should be noted that there is a considerable degree of overlap between the groups (with many individuals falling into more than one category) and in the issues they face in accessing public transport – interventions can therefore benefit multiple groups simultaneously. Specific impacts include:

- **Geographical exclusion:** In Malawi, urban and rural areas alike, spatial-based inaccessibility means that individuals are unlikely to be able to carry out all their activities with their immediate local area. There is also very little community cohesion compared to other areas where there is higher accessibility.
- **Exclusion from facilities:** The relatively high costs of travelling by motorised transport and its sometime poor reliability, frequency and accessibility, along with the limits of the classified road network, all-weather surfacing and bridges, have a negative impact on access to health and education facilities. A number of road improvement projects have been implemented to improve access to services but in some cases only the last 1 or 2kms of infrastructure on the approach to schools and hospitals is said to have been targeted thereby leaving the challenge of reaching that approach via poor infrastructure. This section gives an insight into the extent of rural accessibility challenges in some parts of the country and also highlights some of the indirect impacts that poor rural transport accessibility is having on citizens and the prospects and prosperity of the country as a whole.

7.1.1 Access to education services

The higher number of primary schools relative to secondary schools means that distances travelled to primary schools tend to be the lowest, but distances that children walk to school vary considerably both within and between regions and tend to be high. Dedza is one of many districts where children need to walk an average of 8kms to school, often on a track or footpath, but distances can frequently be far higher. In Chitipa, for example, pupils walk up to 25kms each way. Nkhata Bay is one of several districts where a lack of bridges means that some children walk through watercourses on the way to school, carrying materials by headload. It is not uncommon for children to go to school without eating, and with no food provided during the day; the challenge of making the journey is exacerbated. Impacts reported across districts of Malawi include:

- Children/ parents choosing not to attend/ send their children to school;
- High absenteeism and drop-out rates;
- Attendance at school from a higher than recommended age, once children are better able to walk further;
- Insufficient energy to concentrate during lessons; and
- Attacks en route (violent assaults and rapes resulting in early pregnancies were said to be frequent in some areas).

7.1.2 Access to health services

It is a guardian's responsibility to transport an invalid to a health centre, and the health centre's responsibility to transport those in need of advanced care to a hospital. As with access to education, distances to health centres (and then on to hospitals) varies considerably and in some cases can be prohibitive owing to high transport costs and poor accessibility. In Chitipa people are said to have to travel up to 120km to the district hospital. A lack of funds mean that criteria for access to hospitals are becoming more stringent and that in some districts only pregnant women or candidates requiring specific operations are admitted. There tend to only be either one or two ambulances in each district and in some, such as Nkhata Bay, those with a mobility impairment are transported by boat. Ambulances are not, however, always operational and a lack of fuel and poor vehicle condition and maintenance are frequently referred to as reasons for there being no active ambulances in an area or sometimes a whole district. The accessibility challenge is such that in some districts, such as Ntchisi, pregnant women are advised to travel to the hospital in the eighth month of pregnancy. The district trialled a 'mobile' mid-wife service (provided by bicycles) but this resulted in an increase in fatalities thereby highlighting the potential limitations of mobile services.

7.1.3 Gender-based exclusion

Women adopt multiple roles and are responsible for tasks including food production, domestic work, collecting water, raising children and caring for family members. They are frequently responsible for carrying crops, produce, water and fuel by headload, sometimes with children on their backs, and a large proportion of their time can be spent travelling.

In spite of the inequitable distribution of tasks between men and women, men are said to be more likely to dictate how household budgets are spent and women less likely to travel by motorised modes of transport then men as a result. This is not, however, reflected in the results of the rural transport survey where 42% of respondents were women although most (62%) of these were the head of their household. Of the female respondents, 41% made between 1 and 5 motorised transport journeys per day and while most walked, cycled or travelled by ox-cart to reach the primary motorised mode 26% of the respondents who answered the question used a second motorised mode (motorcycle, car or pick-up) to access it.

District workshops largely comprised men and their expressed opinion about whether rural transport has a disproportionate negative impact on women varied considerably. It is, however, clear that the amount of time that they spend travelling to fulfil their responsibilities has a direct negative impact on their productivity in the agricultural sector, and health and education are also said to suffer owing to accessibility constraints. Travelling with headload can itself also contribute towards health problems, particularly relating to the spine.

There are initiatives in place in various rural areas in Malawi that aim to empower women. These include support to purchase bicycles and provision of mobile health, education, banking and court services, which affords women access to facilities in a manner more compatible with their time and space constraints. A number of additional challenges that women face when travelling in rural areas, and which were raised in district workshops, include the following:

- Harassment/ assault, including from public transport service providers;
- The option to prostitute themselves to kabaza operators instead of paying a (relatively high) fare (a practice that has contributed towards the spread of HIV and AIDS in rural areas);
- Accessing hospitals to give birth – they often need to travel by kabaza, which is unsafe and long journeys mean that some women give birth before reaching hospitals;
- Cycling is perceived as an activity for men in some districts; and
- Time-based exclusion – where transport provision is limited during certain times of the day or where there are individual time constraints.

7.1.4 Rural transport inclusivity

The negative impacts of poor rural transport tend to be disproportionately borne by women and disabled people. The specific challenges posed for disabled travellers relate to often relatively long journey distances and the accessibility of motorised modes of transport. Pick-ups are the only motorised mode to serve some areas, but these are difficult for disabled people to travel on. The relationship between gender and rural transport is more complex.

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The M1 towards Mzuzu, high vegetation on the side of the road with limited pedestrain movement facilities

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Malawi National Transport Master Plan

8 Road sub-sector funding

Road Sub-Sectoral Plan

8 Road sub-sector funding

8.1. Overview

The road infrastructure investment requirements exceed available resources in the public sector in Malawi. This is owing to a combination of factors including the fact that a significant amount of investment required, funding requirements of other priority sectors are also high, and it is challenging to bridge the gap domestically through, for instance, raising taxes owing to the wider socio-economic situation in Malawi.

The Road transport sector operations and capital investment costs have also grown significantly due to increased demand, increased quality expectations and growing cost of production factors. The Government budget does, however, provide a sustainable basis for development expenditure and its allocation for the road transport sub-sector (and the transport sector more widely) is featured in Table 8.1. It shows that the vast majority of domestic development funding for the transport sector (which represents 22% of the overall development budget, a sustainable level) is allocated to the road sub-sector.

Table 8.1 2016/17 transport sector budget, MWK billion

	Domestic funding		Development partner funding		Total	
	MWK billion	% of total	MWK billion	% of total	MWK billion	% of total
Roads	7.1	81%	28.7	47%	35.8	51%
Other Transport Sub-Sectors	1.7	19%	32.4	53%	34.1	49%
Total	**8.8**	**-**	**61.1**	**-**	**69.9**	**-**

Domestic funds constitute 12.6% of the transport sector development budget, which reveals Malawi's high dependency on development partner support - a common feature in sectors across the economy. Its continuation is vital for road sub-sector improvements, and although contributions made by individual development partners may continue to change the level of overall support is unlikely to decrease.

Table 8.2 shows the (discretionary) revenue budgets for the Ministry of Transport and Public Works, aggregated by function and sub-sector. Funding is provided under Vote 400 and is wholly discretionary. The budget that this information was derived from does not indicate what the expenditure is intended to achieve, nor the activities on which money will be spent in the financial year. It is therefore recommended that the road sub-sector amend its detailed estimates of recurrent and capital expenditure to present targets, and expenditure directed against the achievement of each target.

Table 8.2 Revenue budgets for the Ministry of Transport and Public Works, by sub-sector, MWK

Sub-sector	2015/16	2016/17
Ministry HQ	1,226,196,289	584,672,674
Public Works	297,515,404	326,472,381
Civil Aviation	736,521,613	708,460,509
Road Traffic	**336,171,111**	**404,659,024**
Marine	196,595,679	167,360,936
Buildings	291,226,880	677,637,630
Railways	26,541,223	16,941,206
Total	**3,110,768,199**	**2,886,204,360**

Source: Draft Estimates of Expenditure on Recurrent and Capital Budget for the Financial Year, 2016.17

The main source of recurrent revenue funding for the road sub-sector is from the RFA. The 2016/17 budget provides for an allocation for road maintenance of MWK20.6 billion. This is intended to split between national roads (MWK 12.6 billion) and urban roads (MWK8 billion). This skewed distribution in favour of national roads reflects the lack of recent attention to urban road maintenance, and although the allocation has not been based on a formal needs assessment, it is intended to address rehabilitation as well as pressing periodic maintenance needs.

In terms of recurrent revenue funding the road transport sub-sector generates income through fees for the services of vehicle registration, licensing and driver licences. Expected income from these sources for 2016/17 is expected to be around MWK 3.0 billion, against costs of MWK 0.4 billion. The DRTSS is a Treasury Fund and able to spend revenue that it generates. Income should grow in real terms over the next 20 years due to increased motorisation, and therefore the source is highly sustainable. However, costs for managing the sub-sector ought to grow as well, particularly to address road safety.

The fuel levy, collected by MERA, is routed directly to the Road Fund Administration's account. The overall allocation for road maintenance is therefore non-discretionary with funding being legally ring-fenced, thereby making the funding source for road maintenance sustainable. The fuel levy is forecast to raise MWK 23 billion in 2016/17, and historic contributions of the fuel levy to RFA funds is shown in Figure 8.1.

It should be noted that MERA is projecting that fuel consumption will only rise marginally in the next few years. As such the fuel levy at present rate may not rise sufficiently to meet the expected increase in maintenance costs. The Road Fund Act makes provision for several means of funding for road maintenance including budget appropriations by Parliament. In addition, the component of road tax that is collected in the fuel levy could be earmarked for maintenance as well as a portion of the taxes collected on vehicle imports.

Budget appropriation is another significant financing vehicle for road infrastructure investment. It enables the Government to spend public finances for specific purposes and funds are released on a monthly basis, based on the cash flow estimates submitted by the MoTPW. For 2016/17, expenditure on transport represents 1.9% of GDP, with the budget for road maintenance being 0.4% of GDP (recommended road maintenance spending is 1% of GDP; see Chapter 13). Appropriations principally provide for the ongoing commitments and activities for the MoTPW and its departments, and for the transport sector the budget appropriations for the development budget are based on projects submitted as part of the Public Sector Investment Programme (PSIP) which is developed in five year cycles and updated annually. Transport sector projects in the PSIP originate from the TSIP.

Figure 8.2 indicates that an increase in appropriation to the transport sector coincides with the period over which road

Figure 8.1 Fuel levy contribution to RFA total funds

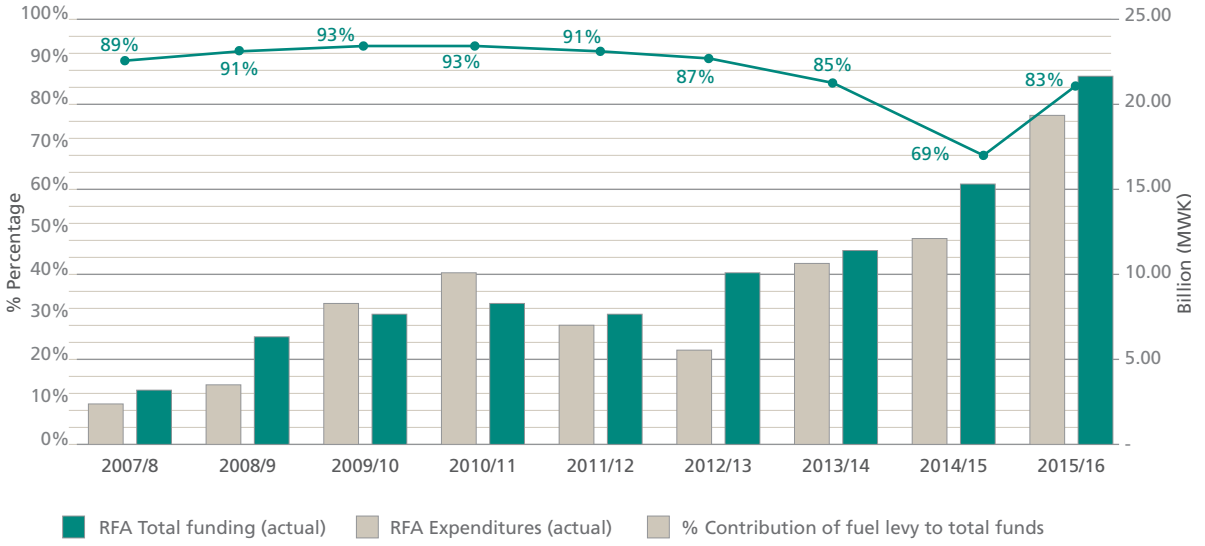
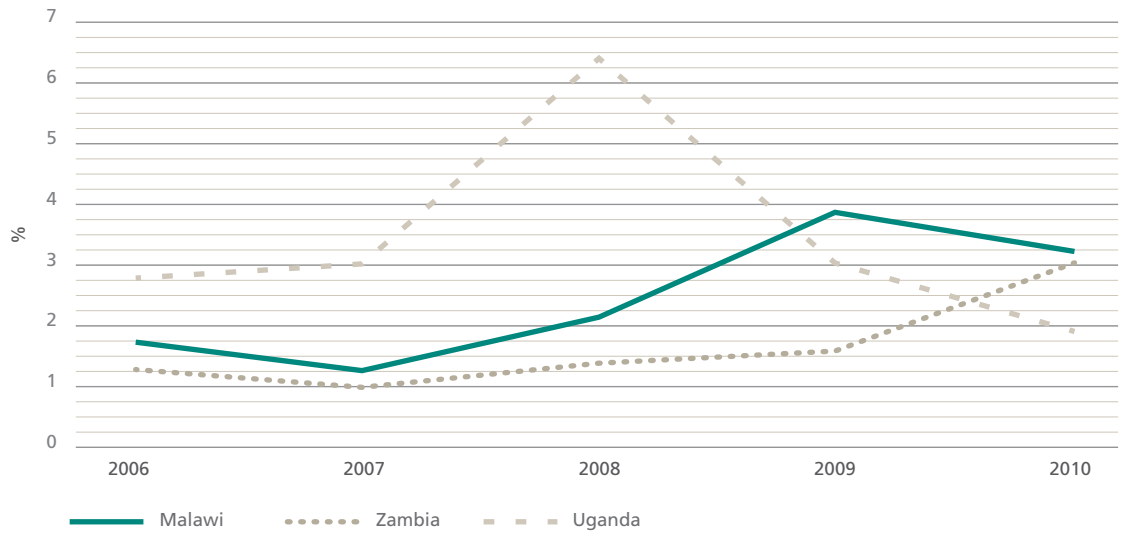


Figure 8.2 Transport expenditure as percentage of GDP in Malawi, Zambia and Uganda



conditions in the country drastically improved. There are, however, risks associated with their use, namely that:

- Other uses of the Government revenue may result in cash flow constraints on road infrastructure projects, leading to delays and inefficient development;
- It can reduce incentives to pursue efficient pricing policies and user charges for transport facilities and services;
- Large funding by the Government reduces the scope to allocate project risks to those best able to manage it; and
- It encourages cost-shifting which is likely to lead to shortfalls in the construction, maintenance, replacement or lowering of standards of transport facilities.

Also, Malawi's external debt to GDP ratio (which is largely serviced through tax revenue) has increased in recent years. This makes significant future infrastructure investment through the Government of Malawi appropriations, or external debt raises, challenging due to the other constraints on tax revenue and the need to service debt.

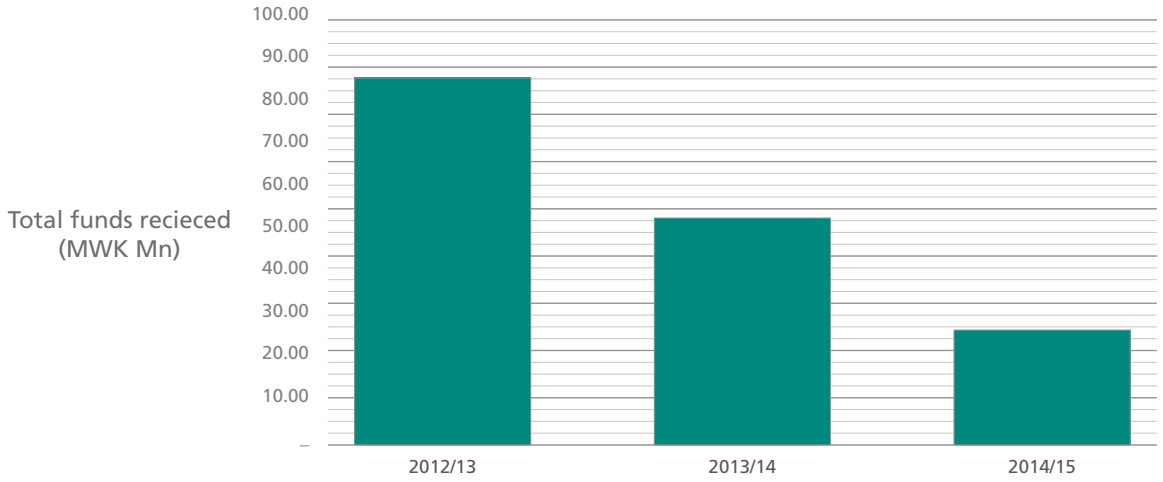
Other sources of funding for the RFA aside from the Government appropriations and donor funding include:

- **International Transit Fees (ITF)**, which are charged on foreign registered trucks and buses with a minimum of two axles and the distance to be travelled in Malawi. The RFA outsourced the collection of the ITF, which is regulated through Southern Africa Development Community (SADC) Protocols, to the Malawi Revenue Authority on 1 December 2014.
- **Financial Provision of the RFA Act (2006)** which allows the Board of Directors to borrow from local banks, using the following vehicles: bank overdraft facility, and; Private Bond (the RFA is exploring to use this option for the first time in the RFA's history and are currently in discussions with a syndicate of banks to back the Issuance of the Bond.

With banks the financing of major infrastructure projects by the Government appropriations putting a significant strain on the Government finances, coupled with the challenges of raising additional Government debt and with African banks only gradually developing their own financing capacities, development capital can help to promote investment. This, in turn, can assist in bridging the infrastructure development finance gap.

Official development assistance in the form of grants, loans and technical assistance supports the sector immensely, particularly with development projects, by extending the range and depth of the sector's investments, balancing risks and rewards, temporarily compensating for funding gaps and supporting the development of the sector based institutions. Actual commitments in the last 36 month period amounted to US$2.1 billion of which the transport sector received US$180 million.

Figure 8.3 Total development partner disbursements to the transport sector



Source: Malawi Development Atlas FY 2013 to 2015, Ministry of Finance, Economic Planning and Development

It can be difficult for the sector to estimate actual donor disbursements for projects as this is dependent on the performance evaluations and conditions attached to the funding agreements. During the period 2011/12 to 2016/17, for example, the EU committed to provide €65 million in Sector Budget Support to the transport sector but the Government of Malawi was unable to meet the performance criteria conditions and only 20% of the support was released. Obtaining donor funding as a sector is also highly dependent on the donors and their areas of interest. In the financial years ending 30 June 2013 to 30 June 2015, the transport sector was not among the top 5 sectors that received disbursements and it received only 5% of the total development contributions made to the country in the period. This was received from seventeen organisations with an average annual disbursement per funding organisation of US$2,075,914. Further analysis of the development contributions to the transport sector indicates that recent funding is decreasing (see Figure 8.3). They will continue to play an important role in the transport sector infrastructure investment strategy in future, but it is important not to over rely on such funding as donor partners have their own funding constraints between the various countries that they support.

In light of funding pressures there is increasing acceptance to diversify the financing sources and increase commercial provision by involving the private sector, but Government of Malawi's ownership of transport sector infrastructure facilities is likely to prevail and remain substantial. This is due to the strong public good features of transport sector infrastructure facilities that by nature make it difficult, even undesirable, to privatise (such as the 9,478km of community roads which benefit the broad community, particularly in rural areas). Some investments are likely to remain predominantly public, where externalities exist in the provision of a balanced and inclusive basis for sustainable growth and where these are also needed to facilitate the involvement of domestic private investors. In the context of the road sub-sector, for example, TSIP identified a resource requirement of MWK 5 million for development projects, maintenance of existing facilities, institutional support and crosscutting issues. Of the identified amount, Government of Malawi committed/ secured MWK 4.34 million through traditional sources of funding leaving a funding gap of 14.1%. The Government aims to bridge the gap by increasing the annual percentage of revenue from road authorities, fuel levies and development partners.

Table 8.3 Total arrears accrued by Roads Authority

Year	Total arrears amount as at financial year end (MWK billions)	% percentage increase / decrease from prior year
2009/10	5.23	-
2010/11	11.47	119.31%
2011/12	10.99	-4%
2012/13	8.50	-29.2%
2013/14	25.99	206%

8.2 Road sector arrears

The Road sector outstanding payments as at 30th June 2014 amounted to MWK 25.99 billion (EU, 2014). Subsequent year arrears amounts are shown in Table 8.3. The dramatic increase in the arrears situation in 2013/2014 led the EU to focus on the examination of that year.

The analysis by type of creditor for the 30th June 2014 arrears is: contractors MWK 23.99 billion; consultants MWK 1.29 billion and others MWK 0.71 billion. Significantly 87% of contractor arrears are owed to only three companies. They are: Mota Engil MWK 16.54 billion; MA Kharafi and Sons MWK 2.73 billion; and Fargo Ltd. MWK 1.69 billion.

The major cause of arrears however was committing to expenditure beyond that provided for by the budget. The team determined that MWK 31.91 billion worth of invoices were payable in 2013/2014. Of this sum invoices totalling MWK 23.41 billion were issued during 2013/2014. This is compared with the budget of MWK 10.08 billion. It can be argued that MWK 13.33 billion of arrears are due to over commitment.

The report made recommendations on dissolving the level of arrears as detailed in brief below[10]:

- Structure budgets to reduce expenditure allocations to align these with available resources.
- Implement measures to scale down the ongoing projects and limit their scope within the available funds to prevent further accumulation of arrears.
- Use the tool developed during the mission to: continually monitor payments and arrears; ensure that RA and RFA records reconcile; and generate status reports for management.
- Agree accounting policies for both the Roads Authority and the Roads Fund Administration to ensure the consistent recording and reporting in respect of roads capital projects.
- Periodical reporting of projects and contractor payments and arrears ensuring that: the PFMA responsibilities for controlling officers and chief executive officers are discharged; and all stakeholders are informed of the latest position in respect of arrears.

10 Assessment of public arrears including liabilities generated from contracts in the road sector Malawi Final report September 2nd, 2014

Exiting heavy goods vehicle from an industrial area blocks the pedestrian facility

Malawi National Transport Master Plan

9 Legal, institutional and regulatory framework

Road Sub-Sectoral Plan

9 Legal, institutional and regulatory framework

This section summarises first the institutional framework of Malawi's road sub-sector and then its strategy and policy, regulatory and financial framework. It only summarises the current framework, which has been the subject of numerous reforms, most recently to promote efficient and competitive delivery.

A key theme in the evolution of Malawi's transport sector has been the functional and institutional separation of public policy and planning, regulation, financing and delivery, combined with the progressive commercialisation, concessioning and privatisation of existing operations and opening-up of the market to new entrants and competition. Reforms in the road sub-sector have been relatively successful, but as in others the availability of funding, a lack of human capacity and skills in key institutions, and a lack of strong private sector market entry and competition, have constrained progress. There is therefore the need for further institutional, policy, regulatory and financial reforms in the road sub-sector.

9.1 Institutional framework

9.1.1 Overview

Table 9.1 below summarises the distribution of institutional responsibility by road sub-sector function.

Table 9.1 Institutional coverage by responsibility and function

Theme	Function										
	Policy Setting & Strategic Planning	Regulation & Oversight	Programme & Project Planning and Design	Delivery	Funding & Financing	Operation & Management	Health, Safety and Security	Monitoring & Outcomes	Compliance & Enforcement	Advocacy & Lobbying	Advice & Technical Assistance
Strategic Roads	MoT W / RA	MoT PW	MoTP W / RA / RFA	RA	RFA	RA / MPS	DTRSS	RA / JTSR	MPS	RFA, DA	DA
Local Roads	MoTP W / RA	-	-	RA	RFA	RA / MPS	DTRSS[11]	-	MPS	LDC	DA
Rural Transport	Mo TPW	Mo TPW	Mo TPW	*	MoF EPD	*	*	*	*	LDC	*
Freight	MRA / FFAM	MRA	MRA	FF	PS	PS	PS	*	MRA	FFAM	*

Key

*	No institution in place
DA	Donor Agencies
DTRSS	Department for Traffic and Road Safety
FF	Freight Forwarders
FFAM	Freight Forwards Association of Malawi
JTSR	Joint Transport Sector Review
LDC	Local District Council
MoFEPD	Ministry of Finance, Economic Planning and Development
MoTPW	Ministry of Transport and Public Works
MPS	Malawi Police Service
MRA	Malawi Revenue Authority
PS	Private Sector
RA	Roads Authority
RFA	Roads Fund Administration

11 The outsourcing of Vehicle and Inspection Services (VIS) from DRTSS to private service providers is in the process of being rolled out.

9.1.2 Existing institutions

There are a number of institutions which have road traffic responsibilities as summarised in the figure and table below. The key institutions are discussed in the following sections.

Figure 9.1 Institutions relating to road traffic

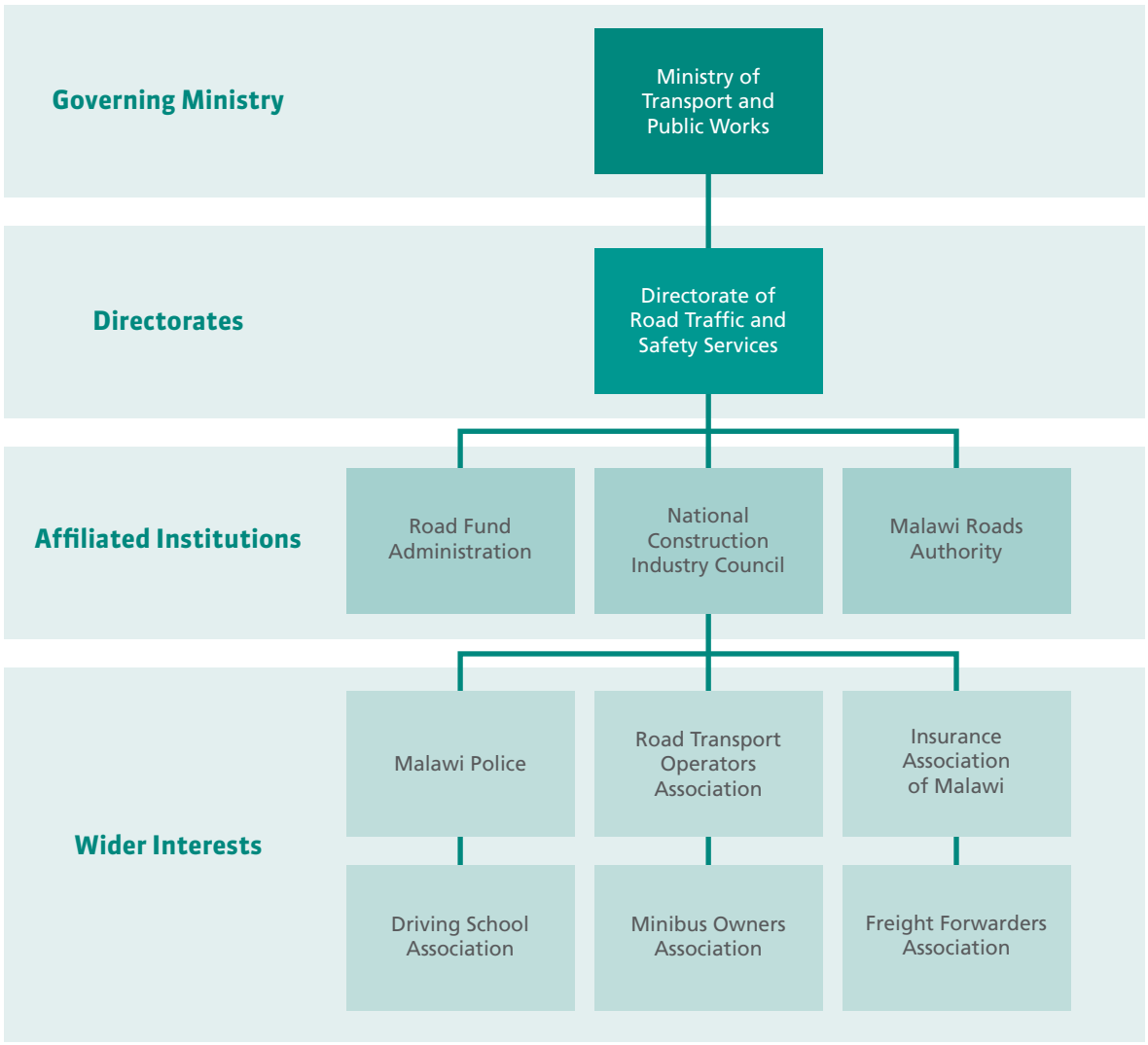


Table 9.2 Institutions and road traffic responsibilities

Institution	Established	Status	Planning	Legal/ Regulatory	Financial	Operations	Construction/ Maintenance	Monitoring/ Evaluation	Enforcement	Education
Ministry of Transport and Public Works[12]	1997	Current	▪		▪			▪		
Directorate of Road Traffic and Safety Services (DRTSS)[13]	July 2010	Current	▪	▪					▪	▪
Malawi Road Authority			▪				▪			
National Construction Industry Council							▪			
Road Fund Administration					▪					
Malawi Traffic Police		Current							▪	
Freight Forwarders Association of Malawi										
Road Transport Operators Association (RTOA)						▪				
Minibus Owners Association of Malawi (MOAM)						▪				
Insurance Association of Malawi				▪						
Driving Schools Association										▪
Road Traffic Directorate	1997	Obsolete	-	-	-	-	-	-	-	-
National Road Safety Council of Malawi (NRSCM)	Sept 1978	Obsolete	-	-	-	-	-	-	-	-

12 *Rationalised from two formal Ministries - Ministry of Transport Post and Telecommunications, and Ministry of Works and Supplies.*

13 *Formed following a merger of the Road Traffic Directorate with the National Road Safety Council of Malawi (NRSCM) to improve operation efficiency.*

9.1.2.1 Ministry of Transport and Public Works

The Ministry has a role through its Principal Secretary to guide the overall implementation of the national road safety strategy ensuring that a National Steering Committee and technical working groups are established for its successful implementation. The National Steering Committee comprises the Principal Secretaries (Chief Executive Officers) of the Ministry of Transport and Public Works and the Technical Working Group (TWG) comprises directors and senior managers on road safety to monitor and report on progress of the implementation of the road safety strategy. The TWG will also build partnerships to enhance coordinated planning, implementation, monitoring and evaluation and act as technical advisors to the National Steering Committee.

9.1.2.2 Directorate of Road Traffic and Safety Services

The Directorate of Road Traffic and Safety Services (DRTSS) has statutory powers to manage road traffic as derived from the Road Traffic Act (1997) and provisions in the National Transport Policy (2004).

The Director of Road Traffic is subject to general directions of the Minister and exercises powers and duties to ensure the Road Traffic Act is upheld, and can delegate duties to authorised officers. Furthermore, the Ministry has established a Committee for Road Traffic Law Enforcement who ensure the laws under the Road Traffic Act are enforced. The Director appoints honorary traffic assessors who have the following duties:

- Protect road infrastructure;
- Check and prevent vandalism of road furniture;
- Report any contravention of the Act;
- Sensitize the general public on traffic safety; and
- Advise relevant authorities on traffic management and control matters.

The functional sections under the Directorate include the following, however these operations are decentralised into four regional operations – northern region, central region, eastern region and southern region:

- Traffic Management;
- Road Safety;
- Information Communication and Technology;
- Axle Load Control; and
- Research and Surveillance.

The Directorate is responsible for issues pertaining to the implementation of policies and directions sanctioned under various Regional and International Conventions including the UN, SADC and COMESA.

The Directorate was formed in July 2010 following the merger of the Road Traffic Directorate and the National Road Safety Council of Malawi bringing together such functions as law enforcement and civic education.

The Directorate is funded by the Treasury Fund which obtains revenue from the following sources:

- Vehicle registration and inspections (for Certificate of Fitness);
- Penalties;
- Driving licenses and application fees;
- Driver testing and certification fees;
- Driving schools and instructor license fees;
- Operator and road service permits sale of publications (Highway Code, Driver Training Handbook and Driver Instruction Manual);
- Advanced driver training courses;
- Motorcycle driver training; and
- In-vehicle assessment programmes.

The Directorate also receives a contribution from the Government of Malawi from the fuel levy and 1% additional levy on motor insurance premiums from Insurance Companies. However, it is believed that the latter source of income is under-remitted, and little income is derived from this source.

There are currently a total of 368 staff against a planned full capacity of 466. Eight personnel form the Management, Policy and Planning functions, while 84 and 276 are in the Operations/ Delivery and Administration departments respectively. The staff are purported to have relevant professional qualifications, with knowledge of data analysis, forecasting software and techniques, monitoring and evaluation processes and systems.

9.1.2.3 Road Authority

The Roads Authority (RA) is a statutory body. RA is the primary agency responsible for the maintenance and rehabilitation of Malawi's roads. A Board of Directors governs the RA. Most of the actual road maintenance and rehabilitation work will be done by contract. The RA is funded by a dedicated road fund currently financed through user charges. This fund may be supplemented by the addition of licensing and registration fees currently collected by the Road Traffic Department (RTD). At present the road fund is supplemented by a Government subvention plan which prepares road works programmes for construction, rehabilitation and maintenance annually. The RA has a significant safety-engineering role in road design, markings, and signs. Improved road shoulders, for example, might help keep bicycles out of the main traffic lanes where they are more likely to be involved in road accidents.

In the headquarters and three regional offices, there are currently a total of 102 staff against a planned full capacity of 108. There are four personnel within the Management, Policy and Planning Departments, two in Project/ Programme Management and 96 within the Administration and Support departments. A majority of the staff (75) have relevant professional qualifications and credentials.

9.1.2.4 National onstruction Industry Council

The National Construction Industry Council (NCIC) was established under the NCIC Act (CAP 53.05) 1996 to regulate, promote and develop the Construction industry in Malawi. Its role within the transport sector is to register all transport infrastructure projects and to provide support to local contractors for road infrastructure projects. It registers contractors, consultants, material suppliers and manufacturers and monitors their progress.

The Council is privately funded by a 1% levy on all civil engineering and building contracts awarded in Malawi, including those let by the RA, income from registration fees from contractors, and charges for training. NCIC also ascribes to the Architects and Quantity Surveyors Act (53:02).

NCIC has a 16 member board and chairman and has four key management positions.

9.1.2.5 Road Fund Administration

The Road Fund Administration (RFA) is a statutory body whose mandate is to finance the maintenance and rehabilitation of public roads and to raise and administer and account for funds for construction, maintenance and rehabilitation of public roads. The RFA reports to the Ministry of Finance; and it manages, administers and accounts for the Roads Fund (comprising of proceeds from fuel levy and transit fees).

The RFA have a total staff complement of 21 against an establishment of 22. There is one vacant position. Of the 21 staff, there are 4 senior managers, i.e. the CEO and 3 heads of departments, 8 middle managers, and 9 other members of staff.

9.1.2.6 Malawi Traffic Police

The Malawi Police Service (MPS) report to the Ministry of Home Affairs and Internal Security. The MPS have the traditional law enforcement responsibilities of crime prevention, accident investigation, traffic enforcement, and community relations. The MPS currently has a staff of 6,500. Although the MPS is the primary agency responsible for traffic enforcement, this function does not appear to be a high police priority for a number of reasons. The police have many other responsibilities and they have very limited funds for vehicles or fuel. The police do not have adequate equipment such as breathalysers, radar guns, or communications. The police rely mainly on roadblocks for inspection purposes. Without communication it is virtually impossible for the police to control speeding or other moving violations.

The Malawi Traffic Police are responsible for traffic law enforcement as per the Road Traffic Act.

9.1.2.7 Clearing and forwarding agents of Malawi

The Clearing and Forward Agents of Malawi (CAFAM) is a grouping of 19 local and international clearing and freight forwarding companies in Malawi. The association was established in 1962 and is mandated by the Malawi Revenue Authority (MRA) to facilitate trade and collect customs revenues on their behalf.

The grouping is registered as an association with the Registrar of Companies and is managed by an executive committee of six personnel with various skills in air freight, shipping and freight forwarding.

9.1.2.8 Road Transport Operators Association

The Road Transport Operators Association (RTOA) is an association of foreign and locally owned road transport operator companies operating in Malawi. They actively lobby and advocate to the relevant Government agencies regarding issues and concerns on the road transporters. One member of RTOA is nominated and represents the association on the Board of the Roads Authority as stipulated by the RA Act.

9.1.2.9 Minibus Owners Association of Malawi

The Minibus Owners Association of Malawi (MOAM) are made up of a grouping of minibus owners and operators. As at 2010 the association had 4,600 members of the southern region, 4,400 in the central and 800 in the northern region[10]. MOAM's executive committee has self-decreeing governance over the minibus fares, routes, depot management. In 2015 the Association incorporated a limited company for the purposes of collecting and managing depot fees collecting from minibuses.

9.1.2.10 Driving Schools Association

The Driving Schools Association of Malawi is an umbrella body of driving schools and instructors whose main mandate oversee training standards of institutions in conjunction with the Road Traffic Department.

The association includes all legally registered instructors in the three regions of the country, who are willing to comply with the training standards to offer the public the reassurance of safe and reliable driver training of all codes.

9.1.2.11 National Road Safety Council of Malawi (former)

The National Road Safety Council of Malawi (NRSCM) was established in 1978 under the Laws of Malawi Chapter 69:06 to promote road safety in all aspects in the country. The vision of the National Road Safety Council was: "Towards a road safety conscious society" and its mission was "to provide civic education on road safety to all users through sustainable awareness campaigns in order to have a road safety conscious society".

The Council had a number of areas of focus including: driving courses, motorcycle rider training, road safety audits, road safety research, scholar patrol programme, schools programme, radio and TV programme and film show campaigns.

The launch of the National Road Safety Strategy in 2015 defines a multi-disciplinary and multi-stakeholder approach to tackling Malawi's poor track record on road casualties. The strategy is currently being coordinated by DRTSS which formally established the National Road Safety Committee of the key stakeholders, at both Steering Group and Technical Group level. The Committee replaces the former statutory National Road Council of Malawi which was incorporated under DRTSS on the basis for organisational efficiency and integrating road safety consideration with vehicle and driver licensing and testing.

10 Reported by Zodiak Online following interview with the general secretary of the association. See 4 November 2010 entry by Pilirani Tambala, 'New System to curb minibus chaos', http://www.zodiakmalawi.com/index/php?option=com_content &view=article&id=1271:new-transport-system-to-discipline-minibus-operator&catid=34:news-top

9.1.3 Existing institutional reform proposals

A summary of institutional reforms in the road sub-sector is shown in Table 9.3 below.

Table 9.3 Institutional reforms proposed in the road sector

Sub-Sector	Impacted organisations	Proposals
Road	Roads Authority Road Fund Roads Department Department of Road Traffic & Safety Services District Councils Commercial Passenger and Freight Operators	▪ Re-affirmation of autonomy, integrity, improvements to internal processes and stronger financing of Road Fund ▪ Refocusing of RA on Core Economic Road Network ▪ New Road Traffic Authority (RTA) from DRTSS as executive licensing/ regulatory body via proposed Road Traffic Bill, with policy retained within MoTPW Roads Department ▪ National Road Safety Committee (within & led by DRTSS/ RTA) ▪ Outsourcing of DTRSS services (e.g. Vehicle Inspection and testing) ▪ Reclassification and devolution of local roads to District Councils, subject to capacity & broader financial base (e.g. RFA, Rates)

The launch of the National Road Safety Strategy in 2015 defines a multi-disciplinary and multi-stakeholder approach to tackling Malawi's poor track record on road casualties. The Strategy is currently being coordinated by DRTSS with formally established the National Road Safety Committee of the key stakeholders, at both Steering Group and Technical Group level. The Committee replaces the former statutory National Road Council of Malawi which was incorporated under DRTSS on the basis for organisational efficiency and integrating road safety consideration with vehicle and driver licensing and testing.

9.1.4 Decentralisation

Stakeholders engaged at the district level detailed the impacts of national level constraints on road networks and also referred to constraints at the district level. There were concerns in particular in the context of the National Decentralisation Policy (NDP) (1998), which was adopted to provide for the establishment of local Governments as the basis and a framework for the devolution of functions, responsibilities, powers and resources to District Assemblies (DA). The Local Government Act (LGA) of 1998 made DAs the operational unit for preparing development plans and implementing those plans. The Department of Local Government (DLG) was mandated to support DAs and to co-ordinate the decentralisation process over its proposed ten-year implementation period. In the context of the road sector the ambitions of the NDP do not, however, appear to have been fully realised and the devolution of responsibility for local roads appears to be progressing slowly and while local roads come under the jurisdiction of DCs much planning and contracting of maintenance and enhancements is carried out by the RA.

A number of specific barriers to enforcing the LGA and realising decentralisation in the context of roads were raised at District workshops. These included the perceived inadequate devolution of financial resources, devolution of human capacity, and of communication, collaboration and co-ordination between central and local Government. There is also a perception in some DCs that enforcement of the LGA has been limited owing to a lack of political will at the national level but while the planned devolution of local roads to DCs, with a refocusing of the Road Authority on the Core Economic Network under the revision to the Public Roads Act, is in line with the wider public sector reform agenda it introduces a number of additional challenges that need to be overcome before the provisions of the LGA are implemented in relation to Malawi's road network. Key among these relate to the need to enhance skills and capacity at the local level as well as establishing an adequate and sustainable financial basis. For City Councils and other districts with major urban areas, further planning, regulatory, financing and institutional reform, as well as

skills and capacity building, may be needed over and above local road maintenance and management to develop integrated, high quality, customer-focused public transport networks which are effective in addressing urban mobility needs. Under the decentralisation agenda, the intention is that districts will take on increasing responsibility for local service planning and delivery, including roads, and a number of pilots will be delivered in 2017 to test how this approach may work in practice.

9.1.5 Institutional deficiencies

9.1.5.1 Complexity of institutional involvement

There are a number of institutions involved in the road sector which adds complexity to responsibilities of each party. The roles of the different institutions are seemingly undefined in places or have significant overlaps with others, often meaning efforts to specific tasks are sometimes duplicated, or in a worse case, not addressed, under the acknowledgement this is under another institutions' remit. Such an issue is exacerbated when communication between institutions is weak.

Clarity in roles for each department and institution will be critical to the success of maximising ownership and therefore success in a specific remit to meet the needs of the road sector. Further definition of roles, and recognition of overlaps to seek out efficiencies are therefore required. Efforts are being made to address this specifically in the road sector including:

- Strengthening the Road Fund and Road Authority for increased autonomy, integrity and financing;
- New Road Traffic Authority (RTA) from DRTSS as executive licensing/ regulatory body via proposed Road Traffic Bill, with policy retained within MoTPW Roads Department;
- National Road Safety Committee (within and led by DRTSS/RTA) to administer regulatory provisions governing motor vehicle administration, driver licensing administration, operator authorisation permit, control and other issues related to traffic management and control; and
- Outsourcing of some DTRSS services, for example vehicle licensing services.

9.1.5.2 Lack of capacity

The acute limitation of funding, organisational capacity, technical and managerial skills and strategic planning and programming competencies is seen at most levels.

The DRTSS currently has 368 staff, out of a total 466 personnel at full strength. The Government financial limitations restrict the ability of the Directorate to recruit staff to its full strength.

In the last two years, the DRTSS has had technical support from the EU in axle load control, vehicle inspection services, and database management.

A functional review was done in 2011 and is now being implemented. Upgrading of all systems is underway.

The planned devolution of local roads to DCs is a major challenge for almost all districts, however, with the possible exception of Lilongwe and Blantyre. For city councils and other districts with urban areas, further planning, regulatory, financing and institutional reform may be additionally needed over and above local road maintenance and management to develop integrated, high quality, customer-focused public transport networks which are effective in addressing urban mobility needs.

9.1.5.3 Involvement of the private sector

The Roads Authority Act (RAA) is a critical piece of legislation for the road transport sector in Malawi. Since section 25 empowers the RA to enter into agreement(s) with any person for the performance of construction, maintenance and rehabilitation of public roads, the RAA facilitates and promotes private sector participation in the planning, designing, construction, maintenance and rehabilitation of public roads in Malawi. Section 25 also gives the RA the power to facilitate Public Private Partnerships (PPP) arrangements for public roads. Considering that subsection 25(3) precludes the RA from undertaking by itself any work for the construction, maintenance or rehabilitation of any public road, but to engage outside contractors to carry out the work, the Roads Authority has a full mandate to procure the construction, rehabilitation, operation, maintenance or operation of public roads through traditional way of public procurement or through PPP arrangements. The RAA should therefore be regarded as complementing the effective implementation of the PPP Act in Malawi.

9.2 Strategy and policy framework

9.2.1 Transport policy

The improvement of Malawi's road infrastructure is a priority of Malawi's Growth and Development Strategy (MGDSII), which highlights the link between transport infrastructure and growth and development. The 2015 National Transport Policy (NTP) is linked to and reflects the priorities of the National Vision, MGDSII and Economic Recovery Plan and outlines eight priority areas that collectively provide a comprehensive set of policies and all of which contain policies and strategies for the road sub-sector.

The policy objectives for the road sub-sector are robust, but there is no alignment between the NTP's priority areas, objectives or outcomes. There is therefore the need for stronger strategies to give momentum to the implementation of policy, stronger links to outcome KPIs, and defining guiding principles for institutional and regulatory development to support the effectiveness of recent reforms in the road sub-sector. Similarly, while the Transport Sector Investment Programme (TSIP) 2011 – 2016 sets out a transport planning and delivery process that is broadly in line with good practice, it has not been linked to or driven by a systematic approach to strategic planning, prioritisation of resources and commitment on the ground. The TSIP is part of the planning process designed by the Government to enable it to plan for the transport sector effectively, it contains prioritized sub-sector projects that are aligned to cost projections and availability of resources. The programme is to be implemented in 2 phases of 5 years each; 2011/12 to 2015/16 and 2016/17 to 2021/22.

The road sub-sector is the only sub-sector yet to undergo a Transport Strategy Process (TSP), which establishes criteria for prioritising project interventions both within and between sub-sectors. This led to the formulation of the Road Sector Programme (RSP) although it has not yet been implemented, and instead the Road Authority's current planning tool is the Road Authority Five Year Strategic Plan and Annual Programme. This approximates more than any other existing sub-sector plan to the TSIP process, but again there appears to have been limited or no progress made in terms of setting strategy, prioritising investment programmes or securing substantial delivery of actions in the plan, and so the opportunity for improvement exists.

9.2.2 Rural transport

Rural transport is accommodated within the broad policy directions set by Malawi's National Transport Policy, which features rural transport infrastructure and services as policy priority areas. As with other elements of the National Transport Policy there is, however, value in providing enhanced detail about how the rural transport policy objectives will be realised. The Implementation, Monitoring and Evaluation Strategy (MoTPW, 2015) lists 'strategies' that will be adopted to realise each policy objective, but they are not well defined and related actions and specific outcomes have not been articulated. For example, 'Develop incentive schemes for rural public transport provision' is the recommended strategy to meet the policy objective 'ensure that local people have access to essential services…' but the modality remains unclear.

An earlier initiative, a Malawi Rural Travel and Transport Program (MRTTP), based in the Ministry of Local Government and Rural Development, sought to address the absence of a clear strategy for rural transport. It was established in 1999 to address an identified lack of clear policies to address rural transport challenges in Malawi. This joint initiative of the Government of Malawi (GoM) and the Sub-Saharan Africa Transport Program (SSATP) was launched to improve the accessibility of rural communities in order to contribute towards poverty reduction. Its objectives were to:

- Establish a clear rural travel and transport policy and institutional framework (including by developing a dedicated policy as a sub-set of the NTP, developing an action plan for its implementation, and establishing an MRTTP unit with steering committee);
- Promote rural travel and transport programmes (a programme of activities accompanied by evidence gathering via surveys and the establishment of a data bank as commitment to sustained efforts); and
- Achieve integrated planning and rational allocation of resources for the rural transport sub-sector.

This initiative to treat rural transport as a 'sub-sector' was not, however, progressed. Only one MoTPW official engaged in the course of this study was aware of the initiative, which is no longer active. This lack of awareness is said to be responsible for there being no reference to the MRTTP in the NTP. It has not been replaced by any other rural transport specific policies or programmes.

This absence of a dedicated rural transport strategy can reduce awareness of, and the incentive to address, the enduring challenges facing the efficient and affordable mobility of people and goods in Malawi's rural areas. It can therefore inhibit the development, prioritisation and implementation of initiatives that target rural transport needs. The current failure to enforce existing regulations is having the same impact, as are the gaps in the current regulatory framework, which does not provide a framework sufficient to facilitate an improvement in rural transport services, which are characterised by negligible planning, co-ordination and consistency.

9.2.3 Road safety

Improving road safety is key to achieving the NTMP objectives (see section 6). On this basis it is worth referring to the National Road Safety Strategy (NRRS) (DRTSS, 2015), which was launched in November 2015 in recognition that not enough had been done to improve road safety and to enforce the Road Traffic Act. The previous Road Traffic Strategic Plan for the Directorate expired in 2007 and so the purpose of this plan, which aims to improve funding for road safety, traffic management, legislation and enforcement, is to give momentum to efficiency and effectiveness improvements. This is particularly timely as the number and severity of collisions is likely to increase as vehicles and road conditions improve.

The Directorate through NRSCM made several achievements in the implementation of the 2002 to 2007 Strategic Plan[15]. It specifically resulted in the following:

- Procurement of state of the art mobile screen for film show programme;
- Revision of Highway Code to conform with SADC standards;
- Formulation of driver training curriculum;
- Installation of traffic lights on major intersections;
- Identification of hazardous road sections (accident black spots);
- Procurement of 3 highway patrol vehicles;
- Procurement of 2 ambulances for road crash victims;
- Initiation of breathalyzer to curb drunk driving;
- Initiation of speed cameras to curb over speeding; and
- Advocated for construction of rumble surfaces to curb over speeding.

The recognition of this issue requires even greater acknowledgement in the betterment of the road regulations, particularly as the preventative measures proposed in the National Road Safety Strategy could be incorporated into the road legislation more explicitly.

The National Road Safety Strategy (2015 to 2020) that now guides the Government of Malawi's road safety interventions is built around eight key outcomes:

1. Improved political support for road traffic safety;
2. Improved funding towards road traffic safety programs;
3. Improved road traffic safety management;
4. Strengthened underlying road traffic safety legislation;
5. Improved road crash data management;
6. Enhanced protection of vulnerable road users;
7. Improve post-crash care services; and
8. Reduced severity of road accident injuries.

The outcomes are intended to be delivered by a number of strategies, each of which has annual sets of actions set out in the implementation plan. However, the actions are not costed either individually or collectively, and hence not linked to any sources of funding.

[15] *National Road Safety Strategy Document.*

There is also a significant road safety component within the Southern Africa Trade and Transport Facilitation Project, funded by the World Bank. Progress is being made on outcomes 6 and 7. Emergency ambulances for deployment on the M1, for example, have been procured and construction is proceeding on the emergency trauma centres. Road safety in Malawi is described in more detail in section 6.

9.3 Regulatory framework

9.3.1 Existing laws and regulations

A strength of the National Transport Policy is that it recognises the importance of legal and regulatory reforms in the transport sector and including specifically in relation to the road sub-sector. There are several legislative documents which have implications on the road network and the governing of road traffic. These are listed in Figure 9.2 and key legislation for the sub-sector is introduced in Table 9.4.

Figure 9.2 Road sub-sector legislation

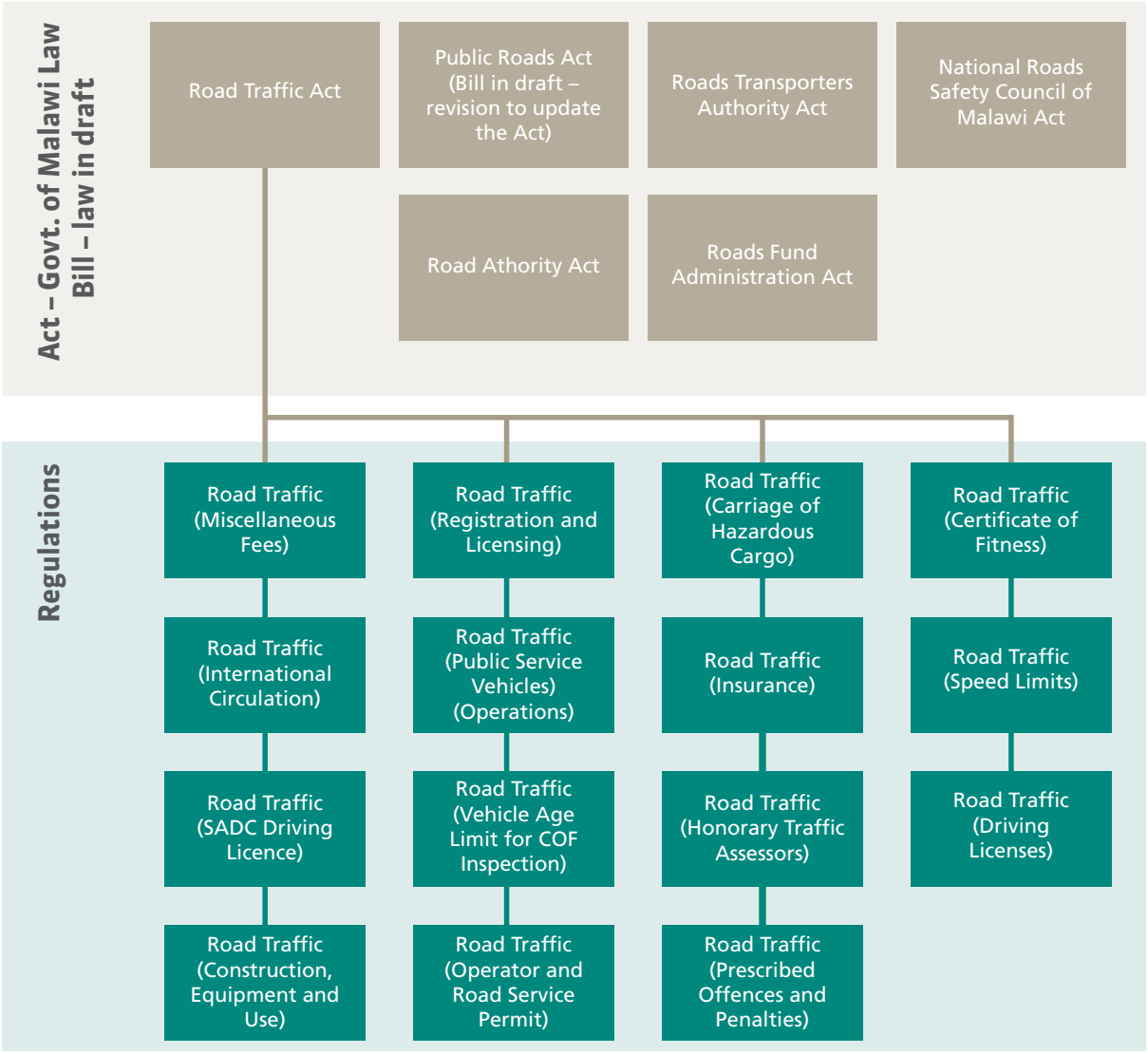


Table 9.4 Key pieces of legislation governing the road sub-sector

Sub-Sector	Impacted organisations	Proposals
Public Roads Act	Ministry of Transport	Approvals are required to connect secondary roads to public roads, which are critical in providing access to the wider road network
Roads Authority Act	Roads Authority (RA)	This Act gives the RA authority to approve and license activities including the construction and maintenance of road infrastructure
Roads Fund Administration Act	Roads Fund Administration (RFA)	The RFA is mandated to provide funds for the construction of road projects
Road Traffic Act (RTA)	Road Traffic Directorate	The RTA relates to various licenses and permits for all road users and vehicles on Malawi's roads
National Road Safety Council of Malawi Act	National Safety Council of Malawi (NSCM)	Approvals of the road safety levy, which is valuable for the provision road infrastructure
Malawi Road Transporters Authority Act	Malawi Road Transporters Authority (MRTA)	Approved transporters, i.e. only relevant to Africans

This legal framework provides a robust basis for implementing these regulations, which are relatively practical and proportionate in terms of the likely benefits relative to the costs of compliance, administration and enforcement. There are, however, some aspects that need to be addressed. These include the following:

- Many of the laws are outdated and do not respond to the needs and challenges of modern forms of transport service delivery. The RA, for example, referred to the Roads Authority Act, Highway Act and Reclassification Laws as hindering implementation of their objectives. They also don't fully reflect the NTP, and the road sub-sector regulations do not contain a robust legal framework for implementing road infrastructure via PPP arrangements;
- It seems that regulations in the road traffic sub-sector are not fully applied (owing to factors including inadequate financial support and human capacity); and
- Road Traffic Regulations are consistent with applicable international, regional and bi-lateral agreements and obligations, but they do not appear to be reflected in local laws and regulations, which are not all compliant.

There are several different institutions, affiliations and laws in place within the road sub-sector that could be harmonised, streamlined and optimised, to maximise efficient use of resources and ensure a strong representation responsible for commercial operations. Such optimisation could be through the role of a function that focuses on commercial operator licensing, and thus complements the role of the DRTSS for driver and vehicle licencing.

In the context of regulations, it is also important to note that the enforcement of road rules and regulations is poor, which will continue to have a negative impact on the condition and safety of Malawi's road network. Stronger regulation is therefore required both of existing road laws through enforcement, but also the operators working in the commercial road transport industry to ensure good practice is actively encouraged. This will require strong leadership and representation from an institution that has both the authority and the resources to manage the sector, whilst acting as strong advocates promoting good practice for road transport operations across the country.

Figure 9.3 Stronger enforcement of regulations governing the road sub-sector is required

It is worth noting that regulatory reform that supports the development of a coherent and trusted legal framework has a key role to play in increasing access to international investment in road infrastructure. There are abundant funds in world markets and very long-term interest rates and the main impediment to Malawi accessing greater infrastructure investment is the lack of a pipeline of sufficient and predictable infrastructure investment activities underpinned by a solid legal framework that sets the right conditions to attract international public and private sector support. Fundamentally, the framework must mitigate risk, and in particular political risk as private investors are only prepared to commit large sums of financing in long-term investments if they can trust domestic legal and political procedures. This increases the likelihood that investments will be as safe and profitable as can be expected, and the support that can be provided as a result can help to ensure that projects are not only financed but operated efficiently.

9.3.2 Legislation deficiencies

9.3.2.1 Lack of standardisation with SADC Protocol

The Public Roads Act does not have provisions that ensure that there is harmonisation of standards when constructing roads in the SADC region.

Statement 3.2.1 of the National Transport Policy requires Malawi to comply with agreed national obligations arising from bilateral, regional and international road transport and traffic conventions. The policy statement under Article 5.2 of the SADC Protocol on Transport, Communications and Meteorology states that Member States agreed to develop a harmonized road transport policy providing for non-discrimination and promoting equal treatment, reciprocity and fair competition, and promoting harmonized operating conditions and the establishment of an integral transport system. With regard to the SADC Protocol, section 2 of the Malawi Road Transporters Act is incompatible as the section promotes discrimination, unequal treatment and unfair competition by unjustly limiting the type of persons who may be eligible to quality as 'approved transporters'.

Section 18 of the Roads Fund Administration Act is in line with Article 4.5 of the SADC Protocol "Funding Sources". Article 4.5 provides Member States with various funding options, e.g. fuel levies, road tolls, load charges etc., similar to the ones set out in section 18 and recommends that Member States promote common understanding and harmonized national road user charging systems. Section 19 mirrors Statement 3.1.1 of the National Transport Policy. Statement 3.1.1 promotes, amongst others, the autonomy of the Roads Fund Administration and other roads agencies. Sections 18 and 19 of the RFA Act and Statement 3.1.1 are in line with the Policy Statements under Chapter 4 of the SADC Protocol.

9.3.2.2 Documentation complexity

There are 22 documents that are covered under the laws and regulations of Malawi's Roads. Within the documentation there are many areas that overlap, leading to areas of repetition, and consequently, very long documentation that is laborious to digest. Given the vast number of documents that are provided, the key principles of the requirements are included within long reams of text, and are not clearly identifiable within the documents.

9.3.2.3 Key gaps and deficiencies in the legislation

Following a review of the road traffic act, the following gaps and deficiencies in the documentation have been identified in Table 9.5. The gaps show areas that are not set out in the legislation, that require inclusion, and the deficiencies discuss areas that are unclear in the legislation and could be subject to challenge.

Table 9.5 Key gaps and deficiencies with the Road Traffic Act

Gaps	Deficiencies
1. There is currently nothing in the legislation about vehicles being required to use lights on the road at darkness. Whilst many vehicles do use lights in hours of darkness, this is not currently mandatory. This legislation could have a significant benefit to safety.	1. Vehicle inspection and vehicle licencing – the vehicle inspection tests do not specify exactly what should be tested (e.g. road tyre pressure). Furthermore, it is not clear what motor vehicle inspection stations are prescribed to inspect.
2. There is currently no mandatory legislation on axle load contained in the documentation. It is noted however that there is something currently in draft on this issue.	2. Driving hours – it is not specified to which classes of vehicles these apply to. Furthermore, there are no fines/imprisonments for exceeding driving hours.
3. There is no requirement for a licence when carrying dangerous goods. This is negative as it allows for inexperienced handlers to carry such goods, who may be poorly informed in how to carry these goods safely.	3. There is a lack of standardisation in driving tests – the requirements of the tests are not detailed, and thus can be applied inconsistently.
4. There is currently no legislation to wear seatbelts in the back of vehicles.	4. There is nothing stated in the legislation about equipment that HGV's should carry, including water and first aid kits. Such provisions could have significant benefits at the scene of an accident for immediate response.

There is an additional issue in the Road Traffic Act relating to non-African Malawian's wishing to operate in Malawi. Section 8 of the Road Traffic Act states that only 'approved transporters' benefit. Section 2 of the Act defines an 'approved transporter' as a Malawi African road transport operator approved and registered by the Road Transport Authority. The inclusion of the term 'African' in the definition means that Malawians who are non-Africans cannot benefit under the Road Traffic Act. It is likely that the Act could be deemed as being unconstitutional, anti-competitive and a restraint on trade if it were to be challenged in a court of law by those Malawians who are non-African. Considering that it is noted in the National Transport Policy that the road transport remains the major mode of transport in Malawi handling more than 70% of the internal freight traffic and 99% of passenger traffic, the Act is too important in terms of competition promotion to contain an anti-competitive definition like the one for 'approved transporter'.

9.3.2.4 The Inefficient administration systems and reporting

Licencing and registration system was migrated to MalTIS at end of 2016. However, weighbridge data and systems are not linked to MalTIS. Furthermore, the motor vehicle inspection division does not supply statistics on numbers of inspections, rejection rates, causes of rejection for CoF.

9.3.2.5 Ineffective enforcement

The Road Traffic Act sets out powers and duties of examiners to stop and inspect vehicles and drivers to ensure they are in keeping with the laws, particularly to ensure that vehicles meet the requirements for a certificate of fitness and that drivers have the correct licences and permits to drive. These personnel are in addition to traffic police officers who when in uniform have the authority to direct traffic to ensure safe and smooth running of vehicles on the road. However, enforcement is often limited to document checks, as opposed to vehicle faults.

9.3.2.6 Enforcement

The lack of enforcement of the Road Traffic Act is of a significant concern that causes risk to the safety of both drivers and civilians. From driving around the roads of Malawi, multiple breaches of the traffic regulations were observed, highlighting the scale of the problem. Road blocks have been set up on key strategic roads to undertake basic visual checks on the safety of the vehicles operating on the road, however clear breaches of enforcement were observed. In a number of cases, vehicles that are operating on the road in an unsafe manner were observed, and at roadblocks, where passed through by the traffic police. One clear example of this is shown on the photograph below, where a HGV with a missing wheel was observed clearing a traffic roadblock manned by the traffic police.

Figure 9.4 Unsafe truck

The driver of the vehicle in this photograph made his way through a roadblock, without his vehicle being taken off the road until a new wheel was installed.

9.4 **Summary**

The findings of a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the road sub-sector's institutional, strategic, policy, regulatory and financing framework is shown in Figure 9.5.

Figure 9.6 SWOT analysis of the road sub-sector's institutional framework

Strengths	Weaknesses
▪ Established the MoTPW with a sector-wide remit represented at Cabinet level. ▪ Formal departments established within the Government for the road sub-sector. ▪ Recently refreshed National Transport Policy which recognises the importance of legal, regulatory and institutional measures and reforms. ▪ Creation of RA/RFA arrangements in Roads Sub-Sector are embedded and have substantially strengthened governance, improved delivery and outcomes. ▪ Reasonable understanding of challenges facing the road sub-sector and proposals for improvement (although requiring stronger evidence base and pioneering of credible solutions in key areas). ▪ Some committed and capable staff within current arrangements effecting change in their areas. ▪ Technical Assistance supporting specific initiatives (e.g. review of legislation) or general capacity building with MoTPW/ other agencies.	▪ Despite reasonable high-level policy, lack of an institutionalised hierarchy of planning, support and prioritisation tools and processes linking policy to effective delivery. ▪ MoTPW structures continue to combine a mix of planning, regulatory and operational/delivery functions and staffing of some departments (including roads) too small to be credible and effective. ▪ Beneath NTP and MoTPW Strategic Plan, limited evidence of development of aligned business plans/annual activity plans for the road sub-sector. ▪ Absence of a dedicated rural transport strategy. ▪ Weak/ outdated legislation, regulations and standards to support reforms constraining the Government's ability to specify road sub-sector improvements. ▪ Lack of funding, and assured funding mechanisms, to support operation of key institutions and their programmes. ▪ Skills gaps, capacity constraints and weaknesses in data/analytical processes at almost every level, with lack of a focused Human Resource and Capacity Development Plan for MoTPW or the sector as a whole. ▪ Staff motivation, incentivisation and attitudes to drive change. ▪ Road sub-sector policy, regulatory and institutional gaps in integrated urban transport. ▪ Constraints in capacity of local private sector (such as RA contractors and private interest in DTRSS inspection services). ▪ Weak linkages between MoTPW Departments and outside JTSR, limited engagement between stakeholders, with JTSR process not being formalised or binding.

Opportunities	Threats
▪ The Government of Malawi continued commitment to sector reform programme. ▪ A number of reforms being progressed or proposed (e.g. establishment of the autonomous RTA). ▪ Proposals for further reforms supported by previous studies (e.g. TransRA), including those which offer potential to share scarce professional skills and resources in a more effective and cost-efficient manner. ▪ Revenue streams through a range of current and potential sources, including Fuel Levy, PPP concession payments, local rates, proposed roads. ▪ NTMP programme recognises, and offers opportunity to achieve integrated statement of policy and strategic interventions aligned with funding/ financing proposals and legal, regulatory and institutional mechanisms for achievement of outcomes. ▪ Decentralisation policy supports potential for stronger duties and capacity for local transport at district level (subject to multi-modal planning process, funding mechanisms and appropriate local capacity building). ▪ Further development and strengthening of JTSR and associated stakeholder engagement processes. ▪ Compliance with, and further strengthening of, international, bi-lateral and regional obligations, engagement mechanisms and structures, including SADC Transport Protocol provisions for Corridor Planning Committees.	▪ Macro-economic instability leading to falling Government resources, investor confidence and consumer purchasing power. ▪ Sector challenges, and ability to effect change, constantly increasing due to increasing transportation costs and limits in funding/financing. ▪ Limited capacity, skills and integrity of key agencies engaged in compliance and enforcement (such as DTRSS Vehicle Inspection, Police Road Traffic Laws). ▪ Limited ability of the public sector to attract and compete for talented professionals overall; in comparison with the private sector. ▪ Limited capacity, competence and ambition of local private sector/contractors to support public sector maintenance/ construction contracts and concessions. ▪ Limited scale of some transport operations weakens case for investing in additional stand-alone dedicated institutions. ▪ Political influence/interference in some investment decisions outside of structured technical processes. ▪ Donor support subject to conditionality, fatigue and changing bi-lateral and multi-lateral priorities.

Deteriorated hard shoulder due to lack of edge protection

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Malawi National Transport Master Plan

10 Vision and strategies for the sub-sector

Road Sub-Sectoral Plan

10 Vision and strategies for the sub-sector

The analysis of existing conditions in the road sub-sector indicates that interventions that will need to be adopted to facilitate the sustainable development of the road transport sub-sector to 2037 should be guided by the following objectives. These objectives are in line with the overall objectives of the master plan as discussed in section 1.3

10.1 Reduce road transport costs for people and goods

The plan targets all drivers of high transport costs by proposing the implementation and enforcement of a suite of infrastructure, planning, regulatory and institutional measures that reflect the role that both public and private sector stakeholders have to play in increasing the affordability of passenger and freight transport in Malawi.

10.2 Improve road safety

This plan will complement, and seek to increase momentum for the implementation of, the initiative of the National Road Safety Strategy (NRRS) (DRTSS, 2015) to address the high social and economic costs associated with Malawi's roads being amongst the most dangerous in the world. Its measures will improve access to financial and technical support to improve infrastructure and traffic management as well as associated guidelines, education and public awareness, data collection, management and application, and legislation and enforcement. In doing so it seeks to both design improved safety and foster a related cultural change, an example of this is included in aspects of Universal Design.

10.3 Consideration of roads interms of their impact on accessibility and mobility

Road sub-sector interventions will be considered from the perspective of their impact on accessibility and mobility for both people and freight. They will not be considered ends in themselves, rather as links within a network that in turn must be viewed as a component of a wider system. The Plan's actions will mainstream and institutionalise, in relation to rural areas in particular, a planning approach that considers sub-sectoral interventions in the wider context of their impact on accessibility.

10.4 Increase road network reliability and efficiency

The Plan outlines an approach for making the most of existing capacity through improved management of existing assets. Infrastructure measures such as traffic calming will be of particular benefit in urban areas and in the context of increasing travel demand.

10.5 Enhance social inclusion

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 road transport sub-sector planning and operation in the long-term.

10.6 Improve resilience to climate change and foster measures that mitigate climate change causes

The plan's measures recognise that Malawi is experiencing climate change impacts, such as more frequent and severe flooding and drought, and that road infrastructure is deteriorating more rapidly as a result. It proposes measures, including in relation to design standards, materials and maintenance regimes, to 'design in' climate change resilience for efficiency and effectiveness savings. The plan also highlights a range of measures designed to mitigate the causes of climate change by reducing carbon emissions.

10.7 Ensure the environmental sustainability of the sub-sector

Environmental sustainability considerations will become particularly important as road infrastructure and demand for its use increases. Recognising that road infrastructure projects and an increase in vehicle ownership and use are fundamental to Malawi's development the measures proposed seek to complement those already in place to ensure that reform and growth occurs in a sustainable manner.

10.8 Adopt a holistic, integrated and participatory approach both internal and external to the transport sector

This study has been guided by the need to ensure inter-modal integration, which is reflected in these actions. Their development has also acknowledged that transport demand is impacted by activities in external sectors, such as tourism, mining and, industry and trade and the need for continual dialogue both intra- and inter-Ministries.

10.9 Foster commitment to allocate sufficient financial, technical and other human resource to the sub-sector

The Plan's Action Areas focus on implementability, of which affordability is a key consideration. The action areas are ambitious but where viable relatively low cost solutions have been proposed, for example in relation to design standards and materials, and sources of potential funding identified in relation to each proposal made.

10.10 Ensure that the above is applied to non-motorised as much as motorised modes of road transport

Most journeys on the road network are made by a non-motorised mode of transport and the measures outlined in this Plan will address the currently limited consideration of, and provision for, walkers and cyclists that characterises the road network. The many benefits include contributing towards maintaining high NMT modal share to 2037.

10.11 Build capacity to sustain and continuously improve the effectiveness of interventions to support the above

The value of the financial and technical support accessed to implement this Plan will be maintained by a programme of capacity building that will be designed to create domestic capacity to effectively implement the Plan and optimise its impacts.

Ten strategies within the road sub-sector have been developed to address these requirements:

1. Increase resources for road sub-sector, particularly rural roads;
2. Strengthen domestic trucking industry to reduce transport costs;
3. Improve road safety;
4. Improve road infrastructure;
5. Enhance rural roads and access to services;
6. Strengthen regulation;
7. Use less, and less polluting, fuel;
8. Institutional reform;
9. Axle load control; and
10. Development of a fuel gas pipeline.

The strategies each comprise committed and proposed activities to be undertaken in the period to 2037. If implemented effectively they will collectively result in the improvement of road infrastructure and the establishment of a more appropriate and modern institutional framework, and ultimately an improvement in accessibility and mobility for all road users. They are consistent with the strategic direction set by the 2015 NTP and have also been guided by the following plans and policies:

- Vision 2020;
- Malawi Growth and Development Strategy (MGDS) II;
- National Transport Policy (NTP);
- Transport Sector Investment Programme (TSIP);
- Road Authority's 5-Year Business Plan; and
- Road Sector Programme (RSP).

Good road markings on a wide hard shoulder on both the sides

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Malawi National Transport Master Plan

11 Proposed interventions

Road Sub-Sectoral Plan

11 Proposed interventions

The road sub-sectoral plan over the next twenty year planning horizon includes a number of interventions ranging from soft measures to infrastructure construction and updgrade. This chapter is centered around all the soft measures and small scale physical interventions. The next chapter (Chapter 12) presenters all the construction, upgrade and maintenance interventions.

All the soft measures are predominantly:

- Legal, institutional and regulatory reforms;
- Road infrastructure improvements;
- Operation and maintenance of the road network; and
- Integration with other modes and planning and policy areas.

They are grounded in an in-depth and holistic outlook of the transport sector in Malawi and in international best practice, whereby it's recognised that a successful Plan must have the following core elements:

- A focus on strategy and high-level objectives;
- An understanding of the scale of the funding required to implement the interventions proposed and the diverse sources of finance available;
- Effective governance requirements;
- The right regulatory framework;
- Co-ordination with other aspects of planning, including land-use, health, education, environment and economic development;
- Recognition of the role of the private sector in delivery; and
- A schedule for monitoring, measuring and reporting progress.

11.1 Increase resources for road sub-sector, particularly rural roads to reduce transport costs

This strategy discusses the following measures:

- Increase fuel levy to 20% of pump price over next 10 years;
- Remove other levies and give only to road sub-sector;
- RFA to issue bonds to raise short-term finance for roads;
- Ring-fence revenues from road tolls for rural roads;
- Introduce tax on profits of agricultural companies in specific crops and specific geographical areas;
- Ring fence a higher proportion of RFA income for rural roads;
- Seek private sector sponsorship of routine maintenance activities, and provision for signs; and
- Introduce a carbon tax.

Further details of the above proposals are given in the following sections.

11.1.1 Increase fuel levy to 20% of pump price over next 10 years

Aim: To increase resources by four times the current amount to meet the total needs of the road network.

Description: 90% of the Roads Fund is comprised of revenue from the fuel levy (with the remainder raised from international transit fees levied on foreign registered trucks), and the revenues have contributed towards a gradual improvement in road conditions since its introduction in 2007. In July 2015 the fuel levy structure changed from being calculated as an absolute amount per litre to a percentage of the pump price, which now stands at an average of US$10 cents per litre. It is estimated that with increasing fuel use this should increase the income from the fuel levy from US$35 million (in 2016/17) to US$140 million in 2026/27. Increases in the pump price of fuel by the MERA have been met with considerable opposition in the past, but with the Road Fund ring-fenced for investment in road maintenance and rehabilitation, and particularly in the context of enhanced transparency and accountability since the creation of the Roads Authority and RFA, it presents an opportunity to improve Malawi's road network and to contribute towards the payment of bonds to raise finance.

Implementation: Short-term (< 5 years).

11.1.2 Roads Fund Administration (RFA) to issue bonds to raise short-term finance for roads

Aim: To raise MWK 10 billion (US$ 0.014 billion) in 2017/18 and another MWK 10 billion (US$ 0.014 billion) in 2018/19 for investment in road maintenance.

Description: The increased revenues associated with an increase in the fuel levy can contribute towards securing bonds to help finance road infrastructure. Malawi's capital market is relatively underdeveloped and is characterised by a limited number of trading instruments and the first bonds issued by the Government were in 2014. It has been relatively challenging for Malawi to attract investors but the potential for bonds to contribute towards a step change in road sub-sector investment has been recognised by the RFA, which is the legal authority mandated to raise finances for public road maintenance, rehabilitation and repair, and has approved a road fund bond.

However, this is a risky instrument as repayments will undermine the future ability of the fund to fully resource road maintenance needs. In addition, there is a danger that revenue raised from the bond(s) will be used to fund development, as opposed to, maintenance expenditure. Bonds should only be issued if there is a guarantee that funds will be utilised for periodic maintenance, and that there is a mechanism in place to ensure that future resources (particularly the fuel levy) are sufficient to fully fund both maintenance needs and bond repayments.

Implementation: Short-term (< 5 years).

11.1.3 Ringfence revenues from road tolls for rural roads

Aim: To ring fence 25% of gross revenue from road tolls to rural roads.

Description: The Government is proposing to introduce a road toll to diversify and provide an alternative source of revenue for the Roads Fund. Toll fees, which will be collected from 20 toll collection points on main roads, are yet to be set but will reflect road maintenance investment needs. The intention is to invest revenues in the roads where the fees are collected, but given the disproportionate investment needs of rural roads and of the transport costs associated with travelling on them, it is proposed that a minimum of 25% of revenue collected from tolls is invested in the rural road network.

A study[16] was conducted to assess whether tolls on the M1 could fully fund toll collection and operations along with maintenance. A toll strategy was developed that involved tolling existing roads on all of the higher volume links and identifying a set of 10 toll gates spread around the country (8 on the M1 and one each on the M12 and M3). A subsequent assessment of the resulting toll road network showed that most of the tolled road users would be poorer commuters moving from home to work each day or rural people going to the city for medical and administrative purposes. While toll gates were specifically located close to major physical

[16] *Public Private Partnership Commission FEASIBILITY STUDY ON TOLL ROADS IN MALAWI: CONTRACT NO.: PPPC/CNS/34/04-2016, DECEMBER 2016, SMEC.*

barriers such as rivers, there are still many alternative routes within urban environments that could result in considerable diversion and increased congestion on previously uncongested roads. Therefore, from a technical point of view, tolling is not a good solution to solve the country's road maintenance funding deficit. The case for tolls is further undermined by the additional cost and time that tolls will impose on road users, adding to transport costs.

Implementation: Short-term (< 5 years).

11.1.4 Introduce tax on profits of agricultural companies in specific crops and specific geographical areas

Aim: To introduce a tax of 0.9% of pre-tax profits to be ring fenced for investment in rural roads in the key production areas.

Description: The agriculture sector accounts for a third of GDP and while an estimated 80% of Malawi's food and 20% of its agricultural exports are produced by largely subsistent smallholder farmers (an estimated two million farming families cultivate approximately 4.5 million hectares of land) the estate sub-sector is Malawi's main earner of foreign exchange. It produces approximately 80% of agricultural exports, mainly from tobacco (alone responsible for around 63% of Malawi's total export earnings), sugar and tea. It is suggested that these estates and key buying companies are charged a 0.9% pre-profit tax for investment in the domestic rural road network. A crop-specific tax would allow taxes to be confined to crops that generate substantial returns thereby making the tax viable.

Implementation: Medium-term (< 10 years).

11.1.5 Ring Fence higher proportion of RFA income for rural roads

Aim: To increase the proportion of RFA income designated to rural roads.

Description: The RFA is responsible for the Government of Malawi's road sub-sector budget, of which 25% is currently earmarked on an informal basis for rural roads. The condition of rural roads and the country's reliance on rural accessibility for economic and social development justifies the safeguarding of a higher guaranteed proportion of revenues for their improvement.

It is recommended that a fixed proportion is set, publicised and adhered to.

Implementation: Medium-term (< 10 years).

11.1.6 Seek private sector sponsorship of routine maintenance activities, and provision of signs

Aim: Diversify the funding portfolio for road maintenance activities by collecting earmarked revenues from private sector sponsorship of related activities and of road furniture, such as signage and roundabouts.

Description: Private sector investment in road maintenance can take many forms, and sponsorship and advertising of street furniture and road maintenance activities can be a means of generating good levels of income with minimal public sector investment. There is the potential for many different road sub-sector related sponsorship opportunities, revenue from which can finance routine activities and cover administrative costs.

Implementation: Medium-term (< 10 years).

11.1.7 Introduce a carbon tax

Aim: To introduce a carbon tax of US$10 per vehicle per year with revenues ring-fenced for investment in road sub-sector climate change adaptation activities and climate change impact disaster management.

Description: A US$10 annual fee, would raise MWK 1.5 billion (US$ 6.88 million) annually, today rising to over MWK 5 billion (US$ 2.06 million) in the plan period (at current prices). Several variations that could be explored include applying the carbon tax to all vehicles at the time of importation and also to all vehicles transiting through the country. The proposed US$10 per annum fee could also be varied according to the relative carbon intensity of the vehicle. There is a high and recognised demand to improve the road network's resilience to climate change impacts and the revenues generated by this fee could be invested in meeting these needs.

Implementation: Medium-term (< 10 years). Collection by DRTSS mirroring Road Transport and Safety Authority (RTSA) in Zambia.

11.2 Strengthen the domestic trucking industry to reduce transport costs

The strategies aim to:

- Enforcement of rules and regulations;
- Review and strengthening of transport service agreements;
- Operator recognition and reward;
- Improve external and self-regulation;
- Establish Road Haulage Industry Council;
- Private sector engagement – freight and logistics forums; and
- Investment in data analytics and technology solutions.

11.2.1 Enforcement of rules and regulations

Poor enforcement of road rules and regulations will continue to contribute to Malawi's poor road conditions and road safety statistics. Vehicle overloading is a key component in this, as it is both unsafe and is damaging to the existing infrastructure, however more general operations should equally be regulated. Therefore stronger regulation requires both of the existing road laws, through enforcement, and the operators working in the commercial road transport industry to ensure good practice is actively encouraged.

Enforcement requires strong leadership and representation – an organisation that has both the authority and the resources to manage the sector, whilst acting as strong advocates promoting good practice for road transport operations across the country.

There are a number of different institutions, affiliations and laws in place within this sector that could be harmonised, streamlined and optimised, to maximise efficient use of resources and ensure a strong representation responsible for commercial operations. Such optimisation could be through the role of function that focuses on commercial operator licensing, and thus complements the role of the DRTSS for driver and vehicle licencing.

Therefore stronger enforcement is required, of the existing road laws, on operators working in the commercial road transport industry to ensure good practice is actively encouraged. This particularly applies to driving standards, vehicle fitness and overloading.

11.2.2 Transport service agreements

A competitive trucking industry requires coordinated actions in order to lower the cost down and to bring prices in line with the costs. A number of measures are required to help address the key issues of trade imbalance between imports and exports, and also aid market entry for new operators. These measures have been grouped under the overall heading of transport service agreements – which in effect are mutual agreements between the regulators and the operators that work to benefit both parties. Such measures account for national and international arrangements and requirements and the key concepts are listed below.

1. **Regulate the access to the industry** to ensure only professional operators can provide trucking services. As a result of the revision of access criteria, some of the informal operators, with limited capacity of compliance, will no longer be allowed to operate, creating space for professional operators to operate at greater efficiency and profitability;
2. **Regulate the access to freight** to promote a competitive industry by liberalisation of access to the transport market, both domestic and international, so as to introduce competition as an incentive for efficiency. This will ensure formalising the contractual relationship between the trucking company and the shipper (or its C&F agents), eliminating unnecessary intermediaries and quantity-based freight allocation quota system to protect national fleet;

3. **Establish a system of quality licensing.** Trucking licenses shall be provided to enterprises that meet specified minimum professional standards, in order to improve the operating environment and establish the conditions for profitable trucking companies. By imposing higher standards on truck drivers, operated vehicles, or the financial, legal, and ethical status of the companies, it raises the professionalism of the industry. Also refer to operator recognitions and reward below.
4. **Harmonisation of requirements for the admission of road vehicles across borders.** The establishment of policy and legal instruments applicable to the circulation of road vehicles should be done in consultation between all participating countries. Such instruments should establish:
   - **i.** Mutual recognition of driving licenses and vehicles registration documents;
   - **ii.** Mutual recognition of third party motor insurance including vehicle liability insurance schemes with compatibility between domestic insurance regulations and domestic insurance operations companies' regulations;
   - **iii.** Mutual recognition of certificates of roadworthiness of vehicles and agreed criteria for compulsory vehicle inspection with adequately equipped inspection centres in each member State, and setting up an efficient control system to ensure compliance; and
   - **iv.** Measures to reduce the current escalation of road accidents.

11.2.3 Operator recognition and reward

There is a strong opportunity in Malawi to develop an operator recognition and reward scheme for commercial road transport companies that provide safer fleet, ensure driver wellbeing, and are based on sound management and operational setup and principles. The case study below, sets out an example of an equivalent scheme in the UK entitled FORS – Fleet Operator Recognition Scheme.

Fleet Operator Recognition Scheme (United Kingdom)

The Fleet Operator Recognition Scheme (FORS) is a voluntary scheme for fleet operators. Its purpose is to raise the level of quality within fleet operations, and to demonstrate which operators are achieving the standard. Contained within this document are the requirements for achieving recognition in order to be awarded FORS accreditation to bronze, silver, and gold levels.

FORS encourages operators to take a closer look at their operation and identify areas of strength to be exploited and areas for improvement to be addressed. A successful bronze audit provides an operator with reassurance that their operation is being run safely, efficiently and in an environmentally sound manner. The FORS logo allows potential customers to readily distinguish FORS operators from other operators. Users of fleet operator services may ask that their suppliers are FORS accredited.

The FORS scheme requires a number of mandatory requirements to be met in order to meet bronze accreditation standards. These are around four categories: Management; Vehicles; Drivers; and Operations. The following table set out the requirements for each of the four categories.

Table 11.1 Fleet Operator Recognition Scheme – mandatory requirements

Category	No.	Title	Requirement
Management	M1	FORS policies and procedures manual	Fleet operators shall document policies and procedures covering all the mandatory requirements of the FORS Standard.
	M2	Organisation structure	Fleet operators shall have a description of the responsibilities of, and links between, senior management and daily operations personnel.
	M3	Responsible person(s)	Fleet operators shall have a formally appointed, qualified (where necessary), trained an experienced person or team in place to run the transport operation and to maintain continuous and effective control.
	M4	Regulatory licensing	Fleet operators shall hold all regulatory licenses necessary for their operation (where applicable).
	M5	Communication	Fleet operators shall demonstrate that company policies and procedures are communicated to all staff.
	M6	Document review	Fleet operators shall have their policies and procedures for the transport operation reviewed by senior management at least every 12 months. This shall include the FORS standard requirements.
	M7	Complaints	Fleet operators shall have a fully functioning complaints system that feeds into decision making and shall ensure that any complaint made against the company is reviewed and acted upon appropriately in order to prevent recurrence.
	M8	Transport fines and charges	Fleet operators shall have a policy in place to investigate and analyse all transport related fines and charges received.
	M9	Transport update	Fleet operators shall have a process for keeping up to date with developments in the fleet and road transport industry todate.
	M10	Information management	Fleet operators shall ensure that all legal and operational fleet information is adequately maintained and managed, particularly around driving standards.
	M11	Tyre and fuel management	Fleet operators shall record and manage tyre wear, condition and disposal, and monitor and manage fuel consumption.

Category	No.	Title	Requirement
Vehicles	V1	Inspection and maintenance plan	Fleet operators shall have a vehicles and equipment inspection and maintenance plan which maintains the record for servicing and repairs of vehicles and specialist equipment.
	V2	Defect checks	Fleet operators shall ensure that vehicles are checked before the first use of that vehicle in a driver's shift.
	V3	Insurance	Fleet operators shall hold a minimum of third party insurance or self-insurance for the whole fleet. Requirements for other forms of insurance include employers' liability, public liability and goods in transit insurance.
	V4	Vehicle excise duty etc.	Fleet operators shall ensure that the appropriate Vehicle Excise Duty (VED) is paid for all applicable vehicles, and that a declaration has been completed for roadworthy vehicles not being used on public roads.
Vehicles	V5	Safe loading and load restraints	Fleet operators shall ensure that vehicles are safely loaded, that appropriate load restraints are used and that vehicles are not overloaded.
	V6	Passenger commercial vehicle safe loading and load security	Fleet operators shall ensure that vehicles are safely loaded, that luggage is distributed evenly across the axles, that on-board items are safety stowed and that vehicles are not overloaded.
	V7	Vulnerable road user safety	Fleet operators shall ensure that all vehicles over 3.5 tonnes gross vehicle weight are fitted with safety equipment to help protect vulnerable road users. This shall include: ▪Prominent warning signage to the rear of the vehicle (where feasible) to visually warn other road users not to get too close to the vehicle ▪ Side-under run protection to all vehicles over 3.5 tonnes gross vehicle weight that are legally exempt from fitment ▪ Class V and Class VI mirrors fitted to all vehicles where they can be mounted, with no part of the mirror being less than two metres from the ground
	V8	Personal safety in or around vehicles	Fleet operators shall risk-assess the potential for persons to fall from vehicles or trailers or subject themselves to risk through non-use of seatbelts on passenger vehicles, and limit the risk of unauthorised access to vehicles through proactive measures.
	V9	Vehicle manoeuvring	Fleet operators shall risk-assess, mitigate and control (where appropriate) risks from vehicle manoeuvring including driving forward, turning, reversing, towing, uncoupling and parking.

Category	No.	Title	Requirement
Drivers	D1	Licensing and qualifications	Fleet operators shall ensure that licenses and qualifications of all drivers (including agency drivers) are checked using a risk-based verification system that directly accesses the DVLA database. This shall be done prior to driving and then at least once every six months.
	D2	Driving standards	Fleet operators shall require that anyone driving on business shall drive within the rules of the Highway Code (with the exception of when under specific direction of the relevant police) and the company policy at all times, and pay particular attention to vulnerable road users.
	D3	Induction training	Fleet operators shall, as part of the induction process, ensure that drivers and line managers complete appropriate training on all aspects of the business, focusing particularly on the health and safety of employees and vulnerable road users.
	D4	Professional development	Fleet operators shall ensure that drivers and line managers undergo approved progressive training and continued professional development with particular attention to the safety of vulnerable road users.
	D5	In-cab technology	Fleet operators shall not cause or permit a driver to use a handheld mobile phone while driving, and where possible they shall restrict the use of any distractive in-cab technology while driving.
	D6	Health and safety	Fleet operators shall ensure that driving risks and workplace transport safety are controlled via a working health and safety policy and that vehicle-specific health and safety advice is given to drivers.
	D7	Driver fitness and health	Fleet operators shall be proactive towards managing driver fitness and health.
	D8	Drivers' hours and working time	Fleet operators shall have policies and procedures to manage both drivers' hours and total working time.
	D9	Driver infractions	Fleet operators shall record and monitor all driving infractions and take remedial action to minimise future recurrence.
Operations	O1	Routing and scheduling	Fleet operators shall ensure that the most safe, efficient and appropriate vehicles are used, and that any vehicle routes to sites or premises are carefully selected and adhered to unless directed otherwise by a relevant authority.
	O2	Specialist goods and abnormal loads	Fleet operators who transport hazardous waste, dangerous goods and / or abnormal loads shall have a written policy to ensure they are handled and transported in compliance with the appropriate regulations, and will appoint a qualified DGSA where necessary.
	O3	Incidents and insurance	Fleet operators shall ensure that incidents, collisions and reported near-misses are documented, investigated and analysed, and that insurance claims are monitored, reviewed and acted upon.
	O4	Engine idling	Fleet operators shall have a written policy and procedure to reduce instances of engine-idling.
	O5	Vehicle/ equipment theft and unauthorised access	Fleet operators shall reduce the risk of vehicle and equipment theft and limit the possibility of unauthorised or illegal access to vehicles.

Such a scheme could work for Malawi, to ensure that commercial road transport companies are only granted licenses to operate on fundamental principles that must be ensured around management, vehicles, drivers and operations. The above could be tailored following discussions with the Government around which categories should be made mandatory, and how the remaining categories should be graded.

11.2.4 Improved regulation

11.2.4.1 External regulation

External regulation of the road freight industry is needed in two important areas: safety and overloading.

Road Safety

Trucks comprised 21% of the vehicle registered in Malawi in 2014, but contributed to 26% of all fatalities in 2015. There is a need for greater emphasis on road safety within the industry, and for enforcement of both driving and vehicle standards. The DRTSS needs to take a strong lead on effective sensitisation and education of truck drivers, along with enhanced vehicle inspection. Enforcement by both traffic police and DRTSS of existing regulations needs to be strengthened.

Overloading

Truck overloading, by axle or combinations of axles, is rampant. This needs to be addressed by massive sensitisation, and improved enforcement. This need not lead to increased transport costs, as balanced loads can still be within the gross vehicle weight limit.

11.2.4.2 Self-regulation

In order to strengthen the capacity of the domestic industry, with a view to reducing transport costs self-regulation is more appropriate. The Government may wish to foster a stronger and more efficient industry, but its role in doing this should be limited to providing the overall legal and regulatory framework that allows for the road freight sector to grow and provide more efficient services. A model for this exists in the form of the National Construction Industry Council (NCIC) which is mandated under law to regulate the construction industry and build its capacity.

A similar Road Haulage Industry Council should be established, under which all road transporters wishing to provide domestic or international services for hire and reward would be required to register, and meet certain conditions, similar to the FORS scheme outlined above. Only registered fleet operators would be able to bid for public sector transport work, and shippers would be encouraged to use only registered companies, in the same way as MERA encourages the use of registered electrical contractors.

The council would be funded by registration fees, and would have no financial implication for the Government. The council would be responsible for the grading companies and building capacity with a particular emphasis on growing small businesses into large ones.

Aim of the Council will be to foster the industry, improve its quality and seek to reduce transport costs.

Action: The establishment under law of a council to regulate the commercial road transport industry is recommended. This may be called the Road Haulage Industry Council.

The council will:

- Register all commercial road transport companies, and only those registered will be able to operate in Malawi. Both domestic and foreign companies would have to register;
- Set standards for registration that meet the expectations of the Government and shippers/customers. Standards to be transparent to aid procedure and appeal processes;
- It will grade companies based on management and operational arrangement, quality and scale of fleet and drivers. Grading's will determine the scale and type of work that they can carry out;
- Advise the Minister on policies and standards for the industry;
- Ensure adherence to international obligations;
- Be responsible for capacity building within the sector and build relationships with development partners to enhance the efficiency of the sector;
- Set the levels of registration fees to be paid by companies, according to grade;
- Seek to embrace technological solutions that will drive efficiencies in the sector;
- Foster the use of low polluting fuels in the road haulage sector; and
- Regulate members with regards to axle load violations and road safety incidents.

11.2.5 Private sector engagement – freight and logistics forums

In order to facilitate better operations, and drive safety and efficiency benefits within the sector, it is important for the public sector to become more attuned to the needs and desires of the private sector.

It is clear that there are strong alliances within the private sector including the Road Transport Operators Association (RTOA) and the Clearing and Forwarding Agents in Malawi (CAFAM), however there is seemingly little engagement between the public and private sector groups.

Whilst the public sector are responsible for setting regulations and policies for these companies to adhere to, it is the private sector that are closer to the operational pressures faced in practice. For example, the private sector are closer to the issues of seasonal variation, staging of vehicles at warehouses, and parking of vehicles at depots for loading and unloading.

Engagement between the public and private sector is critical, to allow for collaboration and mutual development of policies that are of benefit to both the Government and to those operating in the sector. As such, the Government should be responsible for organising freight and logistics forums, on a regular basis, where the public and private sectors come together to discuss issues, and work together to develop policies and solutions to address these.

It is proposed that the public sector seek to understand the issues faced by the private sector, and champion their interests within the framework of road regulation, to enhance mutual benefits within the sector.

11.2.6 Investment in data analytics and technology solutions

The ability to drive efficiencies in any sector comes in the first instance from understanding the current situation, and understanding where the key issues and challenges are in a given area or sector. Currently there is very little data collected within the commercial road transport sector, and thus it is difficult to drive efficiencies and improvements.

It is important to generate a baseline of evidence, collecting trucking industry data e.g. journey times, clearance times, border crossing volumes and times, goods volumes carried by routes, number and locations of accidents; as such data will allow for the public sector to have a greater understanding of the commercial road operations in Malawi, and the interface with bordering countries. Such information paves the way for reviewing trends in information, and this greater understanding of operations allows for greater analysis of the sector, and ultimately for more effective policy formulation and targeted infrastructure development that matches the demands of the industry and addresses key issues.

In addition to basic data collection and analysis, the commercial road transport and logistics sector would benefit greatly from increased investment in technology solutions. There are a number of investments that this could include:

1. **Access to information and communications technology** – firstly to ensure that commercial road operators have access to basic information and communication technology including mobile telephones, computers and the internet. This will be critical to ensure all operators have access to the systems required for operating in this sector – such as online booking systems and telephone communications.
2. **Single window development** – this is critical to drive efficiencies in the sector. The single window will allow for electronic processing of documents and payment of tariffs from any location, and thus remove the need to visit the Malawi Revenue Authority to make cash payments for goods movements.

3. **Vehicle and goods tracking systems** – this allows for live monitoring of vehicles and goods movements. It can include GPS systems for vehicle monitoring, to allow a company to understand at any one time where their vehicles and drivers are. Combined with data analysis, this can drive efficient planning and allocation of drivers and vehicles, to ensure that goods movements are effectively coordinated with continuous utilisation of drivers and vehicles, and reduce 'down time' in use of staff or trucks. In addition, it can include Radio Frequency Identification (RFID) tagging of goods. This is of benefit to customers as it allows customers to monitor where their goods are when in transit, and if they have been checked off through various milestones or not e.g. loaded onto vehicle, border crossing, loaded on ship etc. Each of these measures allow for effective and efficient next stage planning processes. There is the added possibility to have special monitoring of hazardous materials. This could be utilized if required by the Government for monitoring the movement of dangerous goods. Such data could be used to understand which routes are utilized for carrying dangerous goods, and if modifications to restrictions on particular routes (e.g. through urban environments) are required.
4. **Online warehouse and auction floor booking systems** – this allows for efficiencies between the warehouses, auction floors and the road transport operators. It is clear that trucks need to account for an amount of time to load and unload at both warehouses and the auction floor (in the case of tobacco). It is noted that some operators have to wait for long times at the auction floors due to the high demand of trucks wanting to access these at a similar time. In response to this, an online booking system can be developed to allow operators to book slots at times that are convenient to their delivery and onward schedules. This will drive efficiencies for both the auction floors and the road haulage operators.

11.3 Improve road safety

This strategy comprises the following measures:

- Comprehensive education and awareness campaign that targets all categories of road user;
- Improve the speed and standard of accident response;
- Link Malawi's Road Traffic Accident (RTA) system with the Malawi Traffic Information System (MalTIS);
- Review the institutional setting for achieving road safety objectives;
- Improve road signing and marking;
- Assign regional road safety coordinators;
- Introduce a theory test for all drivers;
- Prepare design guidelines for roads in urban areas;
- Issued based enforcement;
- Introduce safe level crossings at road rail crossings; and
- Implement a capacity building programme to support delivery of the strategy.

As with all strategies the phasing of the measures proposed to improve road safety needs to be carefully considered. A capacity performance review activity for all agencies involved in road safety, for example, should be conducted before measures are implemented. Short- and long-term issues need to be differentiated both owing to practical issues of resource and the benefit of being able to adapt the approach adopted based on learnings from implementing priority measures.

11.3.1 Comprehensive education and awareness campaign that targets all categories of road user

Aim: Promote safe behaviours on the road network amongst all road users.

Description: Educating road users is one of the three pillars of the strategy to improve road safety. The DRTSS currently provides road safety education in schools, which includes a programme of road safety clubs and scholar patrols to ensure that children learn about the principles of road safety and practice them from a young age, but this type of education and awareness campaign does not reach many of the users of Malawi's

roads. A number of related efforts have been made. Road safety awareness campaigns have, for example, included the purchase of an interactive mobile screen, radio broadcasts, outdoor advertisements, television and print media campaigns, and a number of road safety functions are commemorated annually including:

- Joint Easter awareness and enforcement;
- Independence period awareness and enforcement;
- Africa Road Safety Day on the third Sunday of November; and
- Road Safety Month in December.

In addition, the Directorate is directly involved in the following training programs: defensive driving courses; in-vehicle assessment programmes and cyclist training. The Directorate also inspects driving schools at least once a year to check compliance. It is proposed that these measures are more clearly packaged and critically reviewed in terms of their engagement with all road users. In spite of the activities referred to above there is, however, still inadequate awareness and understanding about risks associated with travelling on Malawi's road network. Hazard perception, road safety and traffic regulation awareness, and driving standards tend to be poor. International experience has shown that targeted programmes of road safety education and training, preferably comprising both national and regional level activities, can have a positive impact on road user behaviour.

There is a wide range of literature regarding good practices that can be drawn upon to help to increase the effectiveness of the campaign. These extend to training trainers (see proposal in section 11.3.12) and a programme monitoring its impact.

11.3.2 Improve the speed and standard of accident response

Aim: To reduce the likelihood of victims of collisions on the road network being killed or seriously injured.

Description: DRTSS has acknowledged that Malawi has inadequate capacity for the post-crash response and care. There is an acute shortage of ambulances, well trained paramedics, firefighting equipment and personnel. Often the people first to the scene following a road traffic accident do not have basic first aid training to assist people who are injured and are rarely able to communicate with trauma units. The Directorate in collaboration with relevant stakeholders such as the Ministry of Health and World Bank will initiate the establishment of the emergency centres staffed with trauma trained personnel along the M1 road and the procurement of trauma response vehicles. It is also considered that first responder trainings will be conducted. Furthermore, the Directorate intends to introduce a toll-free number in its quest to improve accident reporting. This has not yet been implemented.

11.3.3 Link Malawi's Road Traffic Accident (RTA) system with the Malawi Traffic Information System (MalTIS)

Aim: Improve the Road Traffic Accident (RTA) system.

Description: When the DRTSS introduced MalTIS in 2001 the system was considered state-of-the art. It has since been upgraded and currently has many interfaces, including with the Malawi Revenue Authority and the Malawi Police Service. It is proposed that its utility could be improved by creating an interface with the RTA system. The beneficiaries would include the police, DRTSS, the Ministry of Health and insurance companies.

11.3.4 Review the institutional setting for achieving road safety objectives

Aim: To clarify, and where necessary simplify and streamline, roles and responsibilities relating to the realisation of road safety objectives.

Description: Numerous stakeholders and agencies are involved in the delivery of road safety objectives and there is merit in conducting an independent review of the institutional framework to ensure that the optimal arrangement is in place. This should extend to a critical review of each agency. In the DRTSS, for example, eight of its currently 268 staff work within Management, Policy and Planning functions, and the impacts of the internal distribution of resources, roles and responsibilities should be reviewed.

11.3.5 Improve road signing and marking

Aim: Introduce more warning and instructional road signage and demarcation of space on carriageways to improve awareness of risk and encourage safe behaviours.

Description: Signs that provide warnings and give orders (mainly prohibitive) inform road users and in doing so improve compliance and reduce risk. Road markings can have a similar impact by guiding vehicles and segregating road-users, thereby decreasing the potential for conflict.

11.3.6 Reinstate road safety in primary school curriculum

Aim: Increase awareness about the risks associated with using the road network and contribute towards the development of a national road safety culture.

Description: A wealth of road safety teaching materials are available to educate children from a young age about how to be more aware of risks posed by the road network and about the behaviours that they can adopt to reduce this risk. A programme of related resources, including both materials and activities suited to the Malawian context, are readily available for delivery in classrooms. Standard teaching materials should be prepared and teachers trained to deliver them effectively.

11.3.7 Assign regional road safety coordinators

Aim: To introduce dedicated experts and a related communication channel where local road safety concerns can be raised and related initiatives conceived and communicated.

Description: The Government of Malawi and stakeholders in all of Malawi's districts are aware of both the need and scope to improve rural road safety. The same factors are responsible for collisions across the country but there are some variations by district and the assignment of regional safety coordinators could help to ensure that opportunities to increase the safety of local road networks are identified and their implementation supervised. Related district level initiatives can be challenging to sustain and so this is a more cost-effective approach.

The functional sections of the DRTSS are decentralised into four regional operations, and these could be enhanced by having road safety coordinators assigned to act as a point of communication and engagement with the districts in their region.

11.3.8 Prepare design guidelines for roads in urban areas

Aim: To enhance the road user safety of the urban road network.

Description: Appropriate road design can contribute towards the effectiveness of numerous transport policies and the achievement of multiple social, economic and environmental objectives. Road design in Malawi's urban areas needs to better accommodate NMT users and prioritise safety. It can have an impact on traffic speeds, road user behaviour, and modal split. There are an extensive number of urban road design manuals that detail good practices and that can be readily tailored to the Malawian context.

11.3.9 Introduce a theory course for all drivers

Aim: To improve the competence of drivers with a focus on enhancing their ability to drive safely.

Description: Drivers are required to pass a theory test before obtaining a driving license. New drivers should be required to take a theory course before being granted a provisional licence. It has been demonstrated in countries such as Zambia that they can have a direct positive impact on road safety.

11.3.10 Issue based enforcement for road user behaviour change through road policing

Aim: To increase awareness of regulations relating to discrete motoring offences and road safety, and ensuring parallel enforcement.

Description: Almost all road crashes are caused by, or involve, human error. It is therefore necessary to influence the way drivers, cyclists and walkers behave when using the road network. Measures with the potential to deter drivers from offending include improved and more stringent driving tests, better road signing, and road safety campaigns designed to increase awareness of the consequences of offending.

There are also various ways of influencing behaviour and it is recognised that the most effective approach is a co-ordinated strategy of education and awareness, engineering and enforcement. This proposed measure focuses on enforcement to support and complement education and engineering measures, to specifically target irresponsible, dangerous and unlawful behaviour.

The Road Traffic Act sets out powers and duties of examiners to stop and inspect vehicles and drivers to ensure they are in keeping with the laws, particularly to ensure that vehicles meet the requirements for a certificate of fitness and that drivers have the correct licences and permits to drive. These personnel are in addition to traffic police officers, but despite the dedicated resource enforcement of regulations remains inadequate. It is proposed a campaign of high-profile policing, road-checks and intelligence-led operational patrols to target offenders and act as a deterrent. Examples of issue based enforcement include the following:

1. Drink driving – police can carry out discretionary road stops and require a person to take a breath test, if they have reasonable cause to suspect that they have been driving or attempting to drive with alcohol in their body. This activity can be specific prior to festive periods (more collisions occur during the festive period in Malawi than at any other time of year) and month ends, with discretionary police stops at or near drinking premises. A person failing to provide a breath test is guilty of an offence.
2. Vehicle fitness checks at depots especially for passenger-carrying vehicles. Traffic police are to carry out specific check campaigns prior to vehicles getting on to the roads, this will ensure that drivers of minibuses are given the responsibility to ensure that their vehicle is in it's best condition before carrying passengers. If a vehicle is checked and does not meet the safety standards required, they are disallowed, by revoking of the driving licence and or vehicle registration paper, to continue carrying passengers until the issue(s) is fixed.
3. Vehicle lights – closely related to the general vehicle checks, lighting checks ensure that motorists are made aware of the importance of being seen and their ability to see other road users timely. Low visibility on Malawi's roads is the cause of a significant number of crashes that occur. The traffic police will carry out discretionary stops and check that all lights inherent on a vehicles design are working, these include: headlights, tail lights, daytime running lights, fog lights, signal lights, brake lights, hazard lights and driving lights. Where a set of lights is found to not be working, the choice of a monetary fixed penalty or spending time watching an in-car safety video of how accidents occur due to lights not being used. The video can also contain content on the risk of misusing hazards, full beam nights as well.
4. Special education campaigns: The Police in conjunction with the Department of Safety Services within DRTSS should organise and promote catchy road safety awareness campaigns like Speedwatch in April, Summer Safety in August and Festive Safety over the Christmas and New Year period. The campaigns would ensure that the police are working more intensively during the campaign period, and are supported by media campaigns sponsored bythe private sector or donor patterns.
5. A Speed Watch campaign which aims to reduce the number of deaths and injuries on Malawi's roads caused by excessive and inappropriate speed. Each year, over a four week period, traffic officers across Malawi use the technical equipment and high profile patrols to crackdown on speeding drivers. This is coupled with a publicity campaign on Government owned media to increase public awareness of the dangers associated with this behaviour. Enforcement is increased at locations where speed has been identified as a major causation factor in crashes. The M1 corridor would be a good pilot for this project.
6. Seat Belt Campaigns - safety publicity campaign focuses on education and awareness about seat belt wearing about 3 or 4 times each year. Police enforcers are to give offenders when stopped at a discretionary stop the choice of a monetary fixed penalty or spending time watching an in-car safety video of a car crash and talking to a road safety officer.

11.3.11 Construct safe level crossings

Aim: To improve safety at road and rail crossings.

Description: A risk assessment needs to be conducted at level crossings to ensure that road authorities and network operators identify technical and operational hazards to users and manage any identified risks to people, property and the environment, including with a clear understanding of stakeholder roles and responsibilities. The standard criteria for grade separated crossings is where Average Daily Traffic (ADT) of motorised vehicles multiplied by the trains per day is greater than 50,000 within the space of a few years. Very few, if any, crossings meet this criterion in Malawi, but grade separation is nevertheless recommended in the following cases:

- New railways
- New roads
- Road rehabilitation projects, upon review of a road safety audit

In the context of railway crossings the criteria for introducing grade separated crossings is calculated as follows: *Train Vehicle Units (TVU) = Daily traffic (motorised and non-motorised) x Trains per day*. Where the TVU is less than 6,000 an unmanned level crossing with warning signs is required. Where TVU is more than 6,000 but less than 10,000 an unmanned crossing can be erected and manned on priority basis, and where the TVU is greater than 10,000 a manned level crossing is ideal.

11.3.12 Implement a capacity building programme to support delivery of the strategy

Aim: To ensure that measures to improve road safety are developed, implemented and managed in a manner that optimises their positive impact.

Description: There needs to be an independent review of the capacity of all agencies and their officials involved in road safety work to deliver and sustain the measures outlined above and action taken to address the training needs identified. This could include the development of training programmes and the identification of external resource to facilitate, the establishment of performance evaluation and monitoring a system to ensure that training needs and capabilities are regularly reviewed. There is a shortage of human, as well as financial, resource within the DRTSS, for example, which is having a negative impact on their ability to oversee existing policy and training provision, and so will need to be critically reviewed before this measures advocated in this strategy are rolled out.

11.4 Improve road infrastructure

Whilst this chapter focuses on the soft measures, this section focuses on the support infrastructure, including non-motorised transport infrastructure:

- Review geometric design standards to accommodate non-motorised traffc safely;
- Improve facilities on existing roads for NMT where flows justify;
- Introduce segregated cycle lanes where flows justify;
- Introduce street lighting;
- Construct rest stops on strategic routes;
- Introduce climbing lanes;
- Introduce more forgiving infrastructure;
- Inclusion of Universal Design principles in road infrastructure;
- Introduce a more cost-effective approach to selecting contractors;
- Construct and upgrade roads; and
- Enhance road maintenance and rehabilitation.

These are outlined in turn below.

11.4.1 Review geometric design standards to accommodate non-motorised traffic safely

Aim: To improve the comfort, convenience and safety of NMT.

Description: Geometric design standards provide guidance regarding the positioning of physical elements of road infrastructure. The objectives of this type of engineering extend to improving the infrastructure's 'liveability,' which refers to the potential to design roads to support the realisation of community goals including accommodating a range of modes of transport, such as walking and cycling and to provide access to employment, education and other services. It is now timely to review geometric design standards in the context of their potential to accommodate NMT users safely, as bicycle use is increasing in Malawi and particularly on main roads. Geometric design standards can be considered in terms of alignment, profile, and cross-section, and it is the cross-section element that shows the position and amount of space allocated to different road users including pedestrians, cyclists and motorised vehicles. There are many international design standards that can be reviewed in the context of their suitability for application in Malawi.

11.4.2 Improve facilities on existing roads for NMT where flows justify

Aim: To improve road safety and contribute towards maintaining high levels of walking and in some areas cycling.

Description: Guidelines should be developed regarding the existence of, and standards for, dedicated provision for NMT in areas of high demand. This will encompass infrastructure including footways, cycle paths, and pedestrian crossings.

11.4.3 Introduce segregated cycle lanes where flows justify

Aim: To improve road safety and encourage an increase in cycling's modal share in the long-term.

Description: As with wider provision for NMT, guidelines should be developed and issued regarding the location and specification of segregated cycle lanes. Countries across the world are recognising the benefits of developing networks of connected and segregated cycle lanes, which also have the impact of encouraging cyclists to obey traffic regulations. In an increasing number of countries segregated cycle lanes are also being featured on main carriageways. In Zambia, for example, there is a segregated cycle lane on the main road of T4 at Chipata.

11.4.4. Introduce street lighting

Aim: To improve road safety, personal security and mobility after dark.

Description: Street lights have been introduced in a number of districts in Malawi but in a number of cases they have proved too costly to operate. They have, however, been successfully introduced in some cities in Malawi. Owing to the potential benefits of installing street lights it is proposed that the potential for the implementation and use of solar powered street lighting is explored. The cost of the technology has reduced considerably in recent years.

11.4.5. Construct rest stops on strategic routes

Aim: To aid road safety by combatting driver tiredness.

Description: Rest stops should be provided on strategic routes, where vehicles are undertaking long journeys, so that drivers can benefit from a rest and other amenities. Such amenities should include toilets, fuel, food and drink, and possibly overnight accommodation. These facilities are relatively low cost and can be franchised to the private sector. In road rehabilitation and upgrading schemes land should be identified for rest stops.

11.4.6 Introduce climbing lanes

Aim: To reduce localised delays to traffic.

Description: Climbing lanes are introduced on steep inclines to allow large vehicles to travel at a slower speed than the prevailing traffic without posing an obstruction. The topography of parts of Malawi combined with the relatively old age of some of the vehicle fleet makes it prudent to conduct a review of locations where climbing lanes can be accommodated to improve the efficiency of the road network.

11.4.7 Introduce more forgiving infrastructure

Aim: To reduce the severity of certain road traffic accidents.

Description: The introduction of crash barriers or median barriers, which are effectively strong barriers located either at the side of a road or to separate lanes of traffic travelling in opposing directions (for example in the middle of a dual carriageway) can help to reduce the severity of road traffic accidents. They can, for example, prevent vehicles from crossing over into opposing traffic and leading to a head-on collision, reduce the likelihood of a vehicle that leaves the road gaining momentum down a gradient, and serve as a means to segregate motorised from non-motorised links. They are relatively low-cost measures to implement and have had a positive impact where already implemented in Malawi. It is therefore proposed that their use is more widespread on the road network.

11.4.8 Inclusion of Universal Design principles

Aim: To make provision for ensuring that there is appropriate pedestrian access for the elderly, men and women in wheelchairs and people walking with small children or with pushchairs.

Description: Universal Design infrastructure includes ramp alternatives where there are steps or kerbs and hand-railings alongside steps and where paths have dangerous side drops. Footways, footpaths and cycleways should be free from raised obstructions, dangerous holes, uncovered cross drains and unnecessary poles and signs. Street furniture should not produce narrow pinch points. Street lighting and clear signage are other features of 'Universal Design' concepts, as these benefit pedestrians of all abilities, as well as bicyclists and all road users. When incorporated at the design stage, Universal Design principles have negligible effect on overall costs, but benefit a wide range of pedestrians, including disabled people (VTPI, 2012; Venter et al, 2004; NZ Transport Agency 2009).

Universal Design features benefit pedestrians of all abilities and have a negligible effect on overall costs when included at the design stage.

The Government will require that appropriate 'Universal Design' principles will be included in all new and refurbished NMT transport infrastructure. The Government will expect existing NMT infrastructure that is non-compliant will gradually be retrofitted to 'Universal Design' to be with emphasis on priority situations where existing obstructions and dangerous places cause problems for vulnerable pedestrians and users of mobility devices.

Universal design planning should in effect include:

- Standards for pedestrian facilities, transit vehicles and other transport services adopted by the Local and the Central Government;
- Programme to educate planners and designers on incorporating Universal Design into planning and transport facility design;
- Special projects and funding to reduce barriers and upgrade facilities to meet new accessibility standards;

- Public transit vehicle and station design to accommodate wheelchair users, parents with strollers, hand carts, wheeled luggage, and other baggage (Nelson 2012);
- Complete Streets policies which ensure that roads are designed to serve diverse users and uses, including people with disabilities and other special needs;
- Pedestrian road safety audits to identify potential problems and barriers, and opportunities for improving pedestrian safety (Nabors, et al., 2007);
- Parking facility design standards that dedicate spaces for vehicles used by people with disabilities, and include extra-large spaces for vans with lifts;
- Development of Multi-Modal Access Guides, which include maps and other information to guide people with disabilities to a particular destination, including availability of transit and taxi services, and the quality of walking conditions; and
- Provide travel training, which help people with disabilities learn to use public transport services (Wolf-Branigin and Wolf-Branigin, 2008).

11.4.9 Introduce a more cost-effective approach to selecting contractors

Aim: To improve the quality and resilience of road infrastructure.

Description: The tendency for the Roads Authority to prioritise cost over quality when evaluating tenders regarding road infrastructure development and improvements, for example relating to road design and maintenance, can have a negative impact on the appropriateness and resilience of portions of Malawi's road network. The evaluation process for service contract tenders should be reviewed and a more consultative procurement and design process could be adopted as a result.

11.4.10 Construct and upgrade roads

Section 12 outlines proposed road interventions.

11.4.11 Enhance road maintenance and rehabilitation

Section 13 contains proposals regarding road maintenance and rehabilitation.

11.5 Enhance rural roads and access to services

This strategy comprises the following measures:

- Adopt a regular and sustainable maintenance programme for rural roads;
- Develop local programmes of road infrastructure improvements;
- Develop means of segregating and/ or safeguarding NMT in rural areas;
- Implement traffic calming measures;
- Improve public transport infrastructure;
- Foster safe kabaza use;
- Review road classification;
- Implement rural transport cost SMS centres; and
- Develop a Rural Transport Master Plan.

These are introduced in turn below.

11.5.1 Adopt a regular and sustainable maintenance programme for rural roads

Aim: To contribute towards the provision of timely and adequate road maintenance.

Description: Maintenance is key to the longevity of any road network. It is proposed that a maintenance programme, comprising routine and periodic maintenance, should as a minimum accommodate the following:

- Timely patching of potholes to prevent major loss of pavement (monthly);
- Regular cleaning of drainage systems to prevent any blockage leading to overtopping and washout of the highway infrastructure (annually prior to the start of rainy season and inspection to remove trees and large debris during the rainy season);
- Re-gravelling of shoulders on sealed roads to prevent the sealed surface being undermined (8 to 12 year as periodic maintenance); and
- Re-grading and re-compaction of unsealed roads to restore camber to shed water and maintain 'ride' (annual).

The issue of road maintenance is revisited in section 13.

11.5.2 Develop local programmes of road infrastructure improvements

Aim: To improve road infrastructure across Malawi.

Description: This programme should be developed with the participation of both national and district level officials. It should first prioritise improving infrastructure to ensure reliable all-season basic access to areas of social and economic activity with priority given to areas of agricultural production. It should then support a programme of gradual improvements to infrastructure for all modes beyond basic access that:

- Maximizes contribution to district level rural social and economic development, rural development and agricultural development plans;
- Is equitable and reflect the needs and priorities of vulnerable groups including women, mobility impaired citizens, and children; and
- Has sufficient capacity and resilience to cater for forecast demand.

11.5.3 Develop means of segregating and/or safeguarding NMT in rural areas

Aim: To increase road safety and contribute towards maintaining high levels of walking and in some districts cycling.

Description: Dedicated walking and cycling infrastructure should be provided as well as related instruments designed to guide the mobility of these users and improve their safety. Improvements to the condition of routes and their maintenance, segregation of NMT users from motorised traffic (by physical barriers or demarcation on a shared carriageway), traffic calming measures for motorised road users, formal pedestrian crossing facilities and the provision of bicycle stands can all contribute towards the development of more favourable environments for walking and cycling. The regulatory and policy framework needs to support their introduction, and design guidelines be provided to maximise their impact where implemented.

11.5.4 Implement traffic calming measures

Aim: To reduce congestion at capacity bottlenecks and improve road safety.

Description: A wide range of high- and low-tech traffic calming measures should be introduced in Malawi to make better use of existing infrastructure, improve safety and enhance the environment. Traffic calming measures such as route and right-of-way restrictions, for example, can be applied to alter the direction and movement of traffic, and parking measures designed to improve traffic flow in areas where a lack of restrictions hinder movement. Speed limits and measures to enforce them, such as speed humps, build outs and rumble devices can also be applied to greater effect on Malawi's road network to create smoother driving conditions.

11.5.5 Improve public transport infrastructure

Aim: To improve the accessibility, security and journey experience of public transport.

Description: Public transport infrastructure in Malawi is currently limited in urban but particularly rural areas. There is therefore considerable potential to introduce new infrastructure, and optimise the infrastructure that already exists, to improve public transport. As a minimum bus stops should be provided, traffic calming introduced to improve service reliability, and service information provided at hubs.

11.5.6 Encourage kabaza associations that provide training and road safety equipment

Aim: Foster safe kabaza service provision.

Description: The organisation of public transport operators varies between districts. In some, such as Ntchisi, kabazas are not registered or licensed whereas in others kabaza associations regulate where services are provided and assign drivers to serve specific routes. Associations tend to levy chargers and in return operators are said to receive occasional training, basic safety equipment such as reflective jackets and reflectors, and transport to hospital in the event of a collision. The extent to which these benefits are realised are, however, said to be limited and kabaza

operators have expressed demand for more support post registration. It is recommended that all associations are encouraged to provide their members with training and equipment to increase the safety of the services that they provide and therefore to safeguard both the drivers and their passengers.

11.5.7 Review road classification

Aim: To improve the suitability of roads prioritised for investment.

Proposals for a road re-classification have been drafted. They provide that the public roads of Malawi be classified as follows

a. Main roads, being the inter-territorial roads defined as the international and national arterial roads so designated by the Minister. The Roads Authority will be the responsible authority, including those Main roads in any city, municipality or township.

b. Secondary roads will be defined as the arterial and collector roads between main centres of population and other traffic generators of national importance. The road authority will be the authority.

c. District roads will be collector roads and links between local centres of population and other traffic generators in any district and the road authority will be the DA.

d. Community roads are defined as providing access to land adjacent to the collector network serving travel over relatively short distances, and all rural roads not classified as principal arterial, minor arterial or collector roads, branch roads, estate roads, local access roads and private roads. The authority will be the district assembly concerned.

e. Urban roads are roads, other than main and roads secondary roads, within a city or municipal assembly. The authority will be the city assembly or municipal assembly.

Table 11.2 shows how the existing classified road network will be allocated to the new road classes.

By and large the proposed re-classification is to be supported as it simplifies responsibilities and results in the Roads Authority with a smaller network, more in line with a core economic network for the country.

Bringing community roads into the classification is important because it elevates the position of these rural roads, and provides the potential for funding, at the very least, basic maintenance to ensure all-weather access.

It should be noted that HDM4 does not differentiate between classes of road in prioritising maintenance interventions.

11.5.8 Implement rural transport cost SMS centres

Aim: To provide efficient access to details of transport costs associated with the production and distribution of agricultural produce.

Description: A transport unit, controlled by a central server, could be strategically placed within districts to provide real-time information regarding the transport costs associated with the inputs and outputs of agricultural production, as well as contact details of related transporters in the area. Real-time information could also be provided regarding costs in other regions of Malawi. This could support planning and encourage competition between transport suppliers thereby driving down costs.

Table 11.2 Proposed road re-classification

From existing class		To proposed class				
Class	**Length (km)**	**Main**	**Secondary**	**District**	**Urban**	**Community**
Main	3,587	3,572	15			
Secondary	3,131	434	2,679			
Tertiary	4,168		1,455	2,713		
District	3,410		72	2,909		
Urban	1,560				1,560	
Unclassified	9,073		10	2,473		
Total	**24,929**	**4,006**	**4,429**	**8,095**	**1,560**	**7,019***

* Community road is a new category of road and does not constitute of any of the other classes mentioned in the table.

11.5.9 Develop a Rural Transport Master Plan

Aim: To develop a dedicated and holistic vision and strategy for rural transport in Malawi.

Description: A comprehensive and standalone multi-modal rural transport master plan should be prepared to complement the National Transport Master Plan, which has a very limited scope in terms of rural transport. The activities that have informed the development of this sub-sector strategy reveal the clear need for a more in-depth targeted review and action plan for the rural transport sub-sector. This would be a sizeable task that would require a detailed profile of rural transport demand, infrastructure and services to be developed, including a coherent survey and in-depth interviews. Qualitative and quantitative analysis would also need to be undertaken to understand the economic, socio-economic, environmental and social impacts and constraints of the status quo in rural transport and the gains and losses associated with do nothing, do minimum and ambitious levels of intervention. A thorough review would need to be undertaken to determine the adequacy of existing policy, legislation and institutional arrangements to contribute towards addressing rural transport challenges. Related international rural transport best practices would need to be reviewed, and planned and proposed rural transport investments identified and developed. These should be conceived in the context of rural accessibility strategies, and transport investment programming and financing proposals should be developed.

11.6 Strengthen regulation

This strategy comprises the following measures:

- A legislation review and update;
- Automation of administration processes and systems;
- Regulate and foster rural transport that is safe and appropriate, and establish standards for a minimum route network;
- Regulate service levels with incentives if necessary;
- Regulate fares to safeguard the interests of rural population and consider concessionary the fares; and
- Enhanced enforcement.

11.6.1 Legislation review and update

Aim: To simplify and streamline legislation and regulations to allow for greater understanding and ease of use.

Description: This relates to three key areas of regulation:

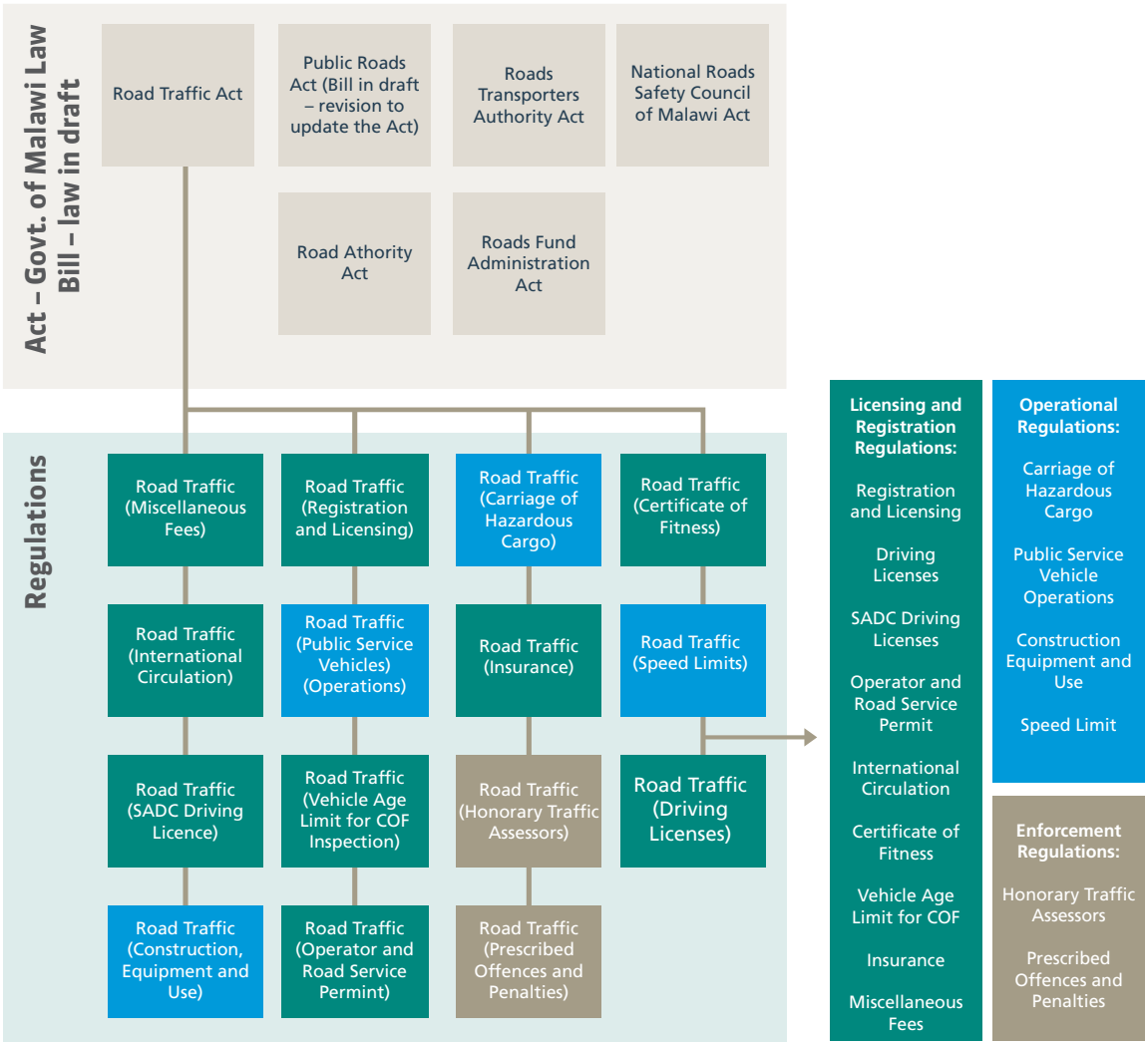
1. Licencing and registration regulations;
2. Operational regulations; and
3. Enforcement regulations.

Figure 11.1 highlights the existing regulation documents, and how these could be streamlined into the three key areas (associated by the colours red (1), green (2) and blue (3)).

In addition to the above, it is important that the revised legislation addresses the key gaps and deficiencies as set out in Chapter 9 which includes the following:

- Addressing gaps in driver and vehicle safety legislation – this would include areas such as use of lights during the hours of darkness; wearing of seat-belts for all passengers; limiting the level of alcohol consumption permitted for drivers; and
- Providing further legislation on operating safely – including limiting the levels of driving hours permitted; the provision of installed safety equipment in operating vehicles.

Figure 11.1 Simplification of existing road regulations



- Setting out clear regulation on vehicle inspection – stating what exactly should be tested as part of a vehicle inspection test and what criteria must be met for a vehicle to operate on the network – this could be administered through stricter protocols on vehicle standards including minimum road tyre treads, minimum tyre pressure levels, and engine quality;
- Providing transparency in the driver licence requirements – standardising the testing procedure through the development of a consistent testing mechanism that is a requirement for operating a vehicle on the road;
- Development of regulations relating to goods handling, to ensure drivers are proficient in the handling of goods – and to develop a shift towards manual and automated truck and trailer loading (rather than the human manual loading of vehicles);
- Provision of legislation on axle load limits to ensure safe operation on the network and which limits the detrimental impact of the road network;
- Ensuring that drivers of hazardous goods vehicles have obtained a respective licence to do so; and
- Stricter penalties for a wider range of regulation infringement, including drink-driving, exceeding driving hours as key examples.

Furthermore, it is recommended that the Public Road Act should be amended to be aligned with Article 4.2 of the SADC Protocol that requires, amongst others, the introduction of road commercial management practices that foster institutional, economic and technical efficiency in the national roads sector within the region, and supporting, nurturing and coordinating national roads activities to the benefit of the region as a whole.

11.6.2. Automation of administration processes and systems

Aim: To use data to drive sub-sectoral efficiencies.

Description: The ability to drive efficiencies in any sector comes in the first instance from understanding the current situation, and understanding where the key issues and challenges are in a given area or sector. Currently there is very limited data collected about road traffic, and thus it is difficult to drive efficiencies and improvements.

It is important to generate a baseline of evidence, collecting predominantly vehicle flow (traffic count) statistics, speed data alongside a detailed accident dataset; such data will allow for the public sector to have a greater understanding of the road utilisation and issues. Such information paves the way for reviewing trends in information, and this greater understanding allows for greater analysis of the sector, and ultimately for more effective policy formulation and targeted infrastructure development that matches the demands on the sector whilst addressing key issues.

In addition to basic data collection and analysis, the road sector would benefit greatly from increased investment in technology solutions and more detailed evidence gathering. There are a number of elements this could include:

1. **Collection of traffic flow information** – firstly to develop an understanding of how the road network is utilized in Malawi, it is important to obtain data regarding vehicle flows on the road network. This should be collected at frequent intervals, and should be classified to show the types of vehicles on the road. At present, the Roads Authority maintain a number of permanent traffic counters, however data from RA suggest a lack of regular collection and management. The data could be collected through manual traffic counting, automatic pneumatic tubing, or through more sophisticated systems including traffic loops built into the road – the latter two which detect vehicles crossing over them.

   The collection of flow data allows for an assessment of volume to capacity ratio which shows which parts of the network are heavily utilized, including areas that are over-saturated.
2. **Speed flow information** – collecting information about traffic speed can be utilized to develop a greater understanding of where there are issues of speeding on the network. This can be collected in parallel with traffic flow data where tubes/ traffic loops are utilized, but alternatively, fixed cameras can be utilized. A knowledge of areas where speeding is prevalent will allow for targeted interventions such as traffic calming, to decrease the risk of accidents and improve road safety.
3. **Vehicle loading data** – weighbridges can be utilized to undertake on-spot checks of vehicle loads to review levels of compliance with weight limits. Breaches can be penalized accordingly by on-site traffic police enforcement. In addition, DRTSS has equipment to undertake loading surveys using mobile equipment as shown in the photographs below. This equipment should be restored so it can be functional and put into use across Malawi, and to target key links where overloading of vehicles is most common.
4. **Use the comprehensive accident database** – it was observed that DRTSS have made progress in the development of an accident database. In order to ensure consistency in the reporting of accidents, DRTSS have developed a standardized form to be utilized by traffic police when on-scene at an accident. The form contains the following areas and thus provides the department with details on the location of the accident, the severity of the accident and its cause. The DRTSS will need to study areas where accidents frequently occur, and also trends in the causes of accidents to develop interventions that can help address these problems in the future. The importance of reporting, evaluating and monitoring this database will be essential to improving road safety in the future.

Figure 11.2 Mobile Weighbridge

11.6.3 Regulate and foster rural transport that is safe and appropriate, establish standards for a minimum route network

Aim: Increase the mobility of rural populations.

Description: Routes should be set along with stipulation regarding the number and size of vehicles to serve each route to ensure that rural mobility needs are satisfied. This must be based on a spatial and demand analysis of rural transport networks, including intra-village and between villages and small towns. It should also be developed in the context of a hub-and-spoke model of public transport provision, which recognises that journeys can comprise several modes and that capitalises upon the unique characteristics of each, such as Intermediate Modes of Transport (IMT), which will continue to play a vital role in rural transport, including as feeder services to minibuses.

11.6.4 Regulate service levels with incentives where necessary

Aim: Increase the mobility of Malawi's citizens.

Description: Incentives should be provided to encourage the operation of public transport services to timetables that meet minimum service levels. Service levels should be based on an analysis of demand, and their scheduling should not compromise the ability of rural populations to rely on the services to facilitate journeys from early morning until late evening.

11.6.5 Regulate fares to safeguard interests of rural population and consider concessionary fares

Aim: Increase the mobility of rural populations.

Description: Introduce, monitor and enforce fare levels, including a concessionary level, that are appropriate to the level of public transport service provided. In order to reduce transport costs, maximum permitted fares should be set and enforced that reflect incomes in rural areas but that do not compromise the ability of operators to comply with regulations and make a profit.

11.6.6 Improve enforcement of Road Traffic Act, with an emphasis on safety

Aim: To improve road safety.

Description: Poor enforcement of road rules and regulation will continue to contribute to Malawi's poor road conditions and road safety statistics. It is a significant issue that must be addressed, to ensure safer operations on the road, and improvement in safety standards.

Some key areas for improving enforcement are set out below, based on four key areas, which will be significant in contributing towards road safety improvements:

- General enforcement;
- Speeding;
- Drink-driving;
- Seat-belt use; and
- Axle overloading.

Enforcement needs to be introduced as a very urgent issue. In order to promote safe operation on the road, any concern about bribery and corruption, if exist, by enforcement officers on the road need to be stamped out. Effective enforcement leads to a rapid reduction in deaths and injuries and can have a long-lasting effect on driver behaviour if implemented in a sustained and intensive manner.

The above may be achieved through police training, centred on education and awareness. Fundamentally in highlighting the implications of unworthy vehicles operating on the road network – potentially through high-impact videos of accidents that could occur. In addition, a reward scheme for police reporting incidents could be encouraged, with targets and goals for reporting metrics. Overall, efforts should be made to develop a safety-culture within both the road related organisations, vehicle operators, and traffic police.

Proposals relating to general enforcement should include the following:

- Prepare national enforcement plans with yearly targets for compliance in the areas of axle-overloading, speeding, drink driving and seat belt use;
- Evaluate regularly and adapt the enforcement plan in accordance with developments and lessons learned;
- Communicate the information on the implementation on the plan, and progress against stated targets – to include formal reporting every two years minimum;
- Ensure that traffic police adopt an enforcement and safety culture given the importance of their presence as a deterrent to commit offences on the roads;
- Apply a 'Zero-Tolerance' approach to enforcing the four priority areas of road safety legislation; and
- Sanctions should be proportioned to the offenses and standardised.

Proposals relating to speeding should include the following:

- Conduct mobile checks to deter speeding across the network;
- Use stationary camera equipment in places where speeding causes a high level of accidents;
- Channel revenues from camera enforcement back into road safety work;
- Promote the introduction of owner or keeper liability as opposed to driver liability to facilitate enforcement of speed limits;
- Install safety cameras able to detect speeding riders and enforce their compliance with speed limits;
- As well as fixed safety cameras, introduce 'section control' or 'time over distance' cameras in places where speeding over appreciable distances is a problem;
- Incorporate speeding offences in penalty point systems, and make sure that levels of penalty escalate as the level of speeding above a speed limit increases;
- Adopt 30 km/h as the maximum speed in residential areas and promote traffic calming measures; and
- Monitor development of speed patterns (mean speed and 85 percentile) and publish regular overviews of change for different road users.

Proposals relating to drink-driving should include the following:

- Introduce targeted breath testing to complement enforcement based on suspicion. This would allow roadside breath testing of anyone driving within a defined location for a defined period of time. This would give the police extra scope to target drink-driving hotspots, and would increase

the perceived likelihood of getting caught, which is a major deterrent to drink driving. This should also be supported by the introduction of evidential roadside breath testing;
- Systematically allow for the testing of drink driving in all police checks relating to driver behaviour;
- Introduce obligatory testing for alcohol in all collisions dealt with by the police;
- Intensify enforcement of laws against driving after drinking by setting targets for minimum level of alcohol checks of the motorist population;
- Introduce systematic breath-testing in all police checks relating to driver behaviour;
- Introduce obligatory testing for alcohol for all road users involved in fatal accidents, if not in all injury collisions dealt with by the police;
- Consider adopting a lower limit for commercial and novice drivers thus stressing the seriousness of drink driving among these two target groups;
- Organise regular nationwide campaigns to raise the public's understanding that drinking and driving is never a good mix;
- Consider the launch of a nationwide initiative for commercial organisations to consider drink driving by their workforces within the context of their business model; and
- Introduce extreme low levels of alcohol tolerance for certain categories of drivers (e.g. bus drivers transporting children) and fleet drivers.

Proposals relating to seat-belt use should include the following:

- Apply international best practices in increasing the use of seat belt, for example conduct intensive enforcement actions at least twice a year;
- Increase enforcement of seat belt use in both front and rear seats. Each driver stopped for whatever reason should be checked for seat belt wearing, as well as any passengers;
- Increase awareness of road-safety incidents related to not wearing seat-belts and use of child restraints;
- Incorporate non-wearing of seat belt as an offence in penalty point systems;
- Provide support for increasing use of child restraint devices;
- Collect yearly data and monitor progress on seat belt wearing rates and use of child restraints; and
- Introduce a set of fixed penalties for low level speeding and seat belt offences.

Proposals relating to axle-overloading should include the following:

- Introduce roadside overloading testing using mobile weigh-stations to complement testing at weigh-bridge locations. Roadside overloading testing would give the Police extra scope to target over-loading hotspots, and would increase the perceived likelihood of getting caught, which would act as a major deterrent;
- Intensify enforcement of laws against vehicle overloading by setting targets for minimum level of checks of goods vehicles;
- Organise regular nationwide campaigns to raise understanding and awareness of the consequences of vehicle overloading; and
- Consider the launch of a nationwide initiative for commercial organisations to consider vehicle overloading within the context of their business model.

11.7 Use less, and less polluting fuel

The demand for petrol and diesel is dependent on the growth of road infrastructure, the price of oil, the future efficiency of vehicles, the growth of alternate modes of transport and the emergence of substitutes like biofuels. Due to the rapid growth of the number of vehicles, the demand for petroleum products will witness a growth in demand and it is expected to rise

to approximately 560 million litres by 2030 considering a high output growth (NCST, 2011) from a total of around 260 million litres in 2015.

The following strategies need to be considered to secure Malawi's energy supply for road transport:

1. Reduce fuel dependency by introducing plug-in hybrid engines;
2. Increase percentage of ethanol petrol blend from 20% to higher levels;
3. Introduce biofuels (as biodiesel or 100% ethanol) and other technologies;

4. Fiscal incentives such as duty free importation of hybrid vehicles;
5. Government procurement of hybrid vehicles for its fleet; and
6. Legislation on compulsory blending of fuel.

11.8 Institutional reform

This strategy comprises the following measures:

- Strengthen role of MoTPW in fostering rural accessibility;
- Establish an Inter-Ministerial Rural Transport Working Group (IMRTWG);
- Consider the establishment of a dedicated (rural) transport authority;
- Increase district council participation in decision-making that impacts rural transport in their district;
- Build district capacity for decentralisation; and
- Establish a Road Haulage Industry Council (RHIC).

These are introduced in turn below.

11.8.1 Strengthen role of Ministry of Transport and Public Works in fostering rural accessibility

Aim: To promote and safeguard rural road infrastructure (and service) development and improvement.

Description: The MoTPW's mandate should be extended to cover guiding and maintaining momentum for the improvement of rural transport infrastructure and services to ensure that:

- Related actions are developed and implemented in a co-ordinated manner,
- There is momentum to sustain their progress, and
- Amendments or ameliorative action can be taken as and when necessary.

This could be done by extending the role (and title) of the Roads Department.

11.8.2 Establish an Inter-Ministerial Rural Transport Working Group (IMRTWG)

Aim: To improve rural transport policy coherence.

Description: A long-term arrangement that would enable synergies both internal and external to the transport sector to be identified and capitalised upon and potential conflicts to be addressed. Led by the MoTPW it should contain officials from the: Ministry of Agriculture, Irrigation and Water (MoAIW); Ministry of Health (MoH); Ministry of Education, Science and Technology (MoEST); Ministry of Gender, Children, Disability and Social Welfare (MoGCDSW); Ministry of Local Government and Rural Development (MoLGRD); Ministry of Industry, Trade and Tourism (MoITT) and; Ministry of Natural Resources, Energy and Mining (MoNREM).

11.8.3 Consider the establishment of a dedicated (rural) transport authority

Aim: To promote and safeguard transport development and improvement particularly in rural areas.

Description: If efforts to strengthen the role of the MoTPW in fostering rural accessibility are either not possible or effective then the potential to establish a dedicated authority with the responsibility to plan, coordinate, procure and monitor rural transport service provision should be explored. This will help to ensure that thresholds are set and enforced, for example in relation to service standards and fares.

11.8.4 Increase district council participation in decision-making that impacts rural transport in their district

Aim: To increase the meaningful participation of district level officials in the prioritisation of road projects submitted to the MoTPW.

Description: District officials are not involved in the prioritisation of interventions made by the MoTPW. A district representative, themselves having consulted with stakeholders within their district, should play an active role in related decision-making. This would help to enforce the bottom-up participatory approach advocated by the MoLGRD planning guidelines (2004).

11.8.5 Build district capacity for decentralisation

Aim: To identify opportunities to equip districts with the resources needed to deliver the functions of governance and development allocated to them in the National Decentralisation Policy (NDP) (1998).

Description: The current Decentralisation Agenda in principle gives DCs, including those for Cities and Towns, more powers and duties to plan and deliver services locally rather than through the Central Government. Whilst this evolution has not yet happened, six pilots are due to be undertaken later in 2016 and in principle, the RFA Act requires this activity to be co-financed by the Road Fund and such a commitment is set out in the current RFA Strategic Plan. However, appropriate technical support should be provided in order for districts to become contracting authorities in their own right, plan and prioritise their local road needs and manage the implementation of works over time possibly in the form of Technical Support Units. The Road Fund, Roads Authority and Roads Department of MoTPW have key roles to play in this respect.

11.8.6 Establish a Road Haulage Industry Council (RHIC)

Aim: To strengthen the domestic freight industry and reduce transport costs.

Description: A RHIC should be established to represent, promote, register and regulate Malawian operators of freight transport services. There are many opportunities to create a more modern, efficient, safe and effective sub-sector, and the dependence on the country's economy on such services justifies that this be treated as a priority. For comparative purposes, its function could be similar to that of the National Construction Industry Council (NCIC), which creates an enabling environment for the improvement of Malawi's construction sector, including conditions for the sector's employees. Its primary role would be to ensure that operators conduct their businesses efficiently while adhering to prescribed minimum standards.

11.9 Axle load control

This strategy comprises the following measures:

- Conduct a sensitisation exercise on truck operators and drivers on overloading and load balancing;
- Install CCTV at weighbridge stations;
- Increase number of inland weighbridge stations;
- Introduction of computer system derived spot fines for overloaded vehicles; and

These are introduced in turn below.

11.9.1 Conduct a sensitisation exercise on truck operators and drivers on overloading and load balancing

Aim: To reduce the deterioration of road conditions by increasing the capacity of freight vehicle drivers to more evenly distribute vehicle loads.

Description: A recent survey found that half of all trucks weight were overloaded by axle but very few by gross vehicle weight (see Table 3.3). The study reviewed the loading capacity of trucks based on three types of axles (single, tandem and tridem) and found that transporters prefer to overload specific axles while they observe the limit of the GVM. This however inflicts more impact on the road. Increasing the awareness of transporters about the overall dynamics of axle loading and how this could therefore reduce damage to road infrastructure.

11.9.2 Install CCTV at weighbridge stations

Aim: To record vehicle registration numbers, increase compliance and reduce corruption.

Description: CCTV with Automated Number Plate Recognition can be used to capture each vehicle's number plate as it passes through a weighbridge. This can help to facilitate revenue collection and also monitor activity in the vicinity of the trucks, which can contribute towards site management.

11.9.3 Increase number of inland weighbridge stations

Aim: To reduce domestic overloading of freight vehicles and increase revenues from related fines.

Description: Weighbridge stations are used to check both axle weights and gross vehicle weights, and increasing their number will contribute towards protecting the road condition by increasing the number of vehicles that can be checked, encouraging compliance with statutory limits, and increasing revenues generated from related fines, which can be reinvested in the transport network. The linking of weighbridge stations to MaLTIS is currently at an advanced stage of implementation and will further enhance the impact of increasing the number of weighbridge stations.

Priorities for new inland weigh bridges are:

- M12 Lilongwe to Mchinji

- M1 Lilongwe to Mzuzu

These should be Weigh-In-Motion (WIM) in order to limit disruption to legally loaded trucks.

Designs for major rehabilitation and road upgrading projects should include the installation of weighbridges. This should apply to all main roads and other roads where goods vehicles are in excess of 50 vehicles a day.

11.9.4 Introduction of computer system derived on-the-spot fines for overloaded vehicles

Aim: To increase compliance with payment of fines and improve efficiency.

Description: It can be quicker and less resource intensive to charge on-the-spot fines for overloaded vehicles, particularly when calculated by computer, than by alternatives, which require more paperwork and time from police and potentially also other public sector workers. There are numerous technologies that have already been installed across East Africa that have increased the compliance of truck owners.

11.10 Development of a fuel gas pipeline

Aims: Reduce cost of transporting fuel; reduce fuel cost and costs of transport

Description: Government of Malawi has in the recent past explored the possibility of bringing a regular supply of oil products into the country via a pipeline which would include construction of fuel stores in several regions of the country. Malawi currently imports 93% of its oil products, namely diesel, petroleum and lighting fuel, via the ports of Beira and Nacala, in Nampula province, northern Mozambique, in tanker trucks, whilst 7% arrives from Dar-es-Salam, in Tanzania. A pipeline has the benefit of increasing the country's fuel reserves by up to three months against the existing reserve of ten to 14 days.

Malawi also faces a major challenges in its ability to meet the country's energy requirements. Recent data shows that the electricity is accessible to less than 1% of the rural population and is unreliable. 2008 statistics in Table 11.3, show that for lighting, 85.7% of the population use paraffin in hurricane and pressure lamps, 7.2% use electricity, 2.2% use candles, 2.6% use firewood and 1.4% use other means of alternatives for lighting. For cooking, 88% of the population use firewood, 8% use charcoal, 2% use electricity, 1% use paraffin and 1% use other means such as crop residues and animal dung.

Table 11.3 Population distribution by source of energy for lighting and cooking

	Cooking (% of population)			Lighting (% of population)		
Source of energy	**National**	**Rural**	**Urban**	**National**	**Rural**	**Urban**
Charcoal	8	1.7	43.4	0	0	0
Electricity	2	0.4	13.6	7.2	1.9	37.5
Firewood	88	95.7	41.8	2.6	2.9	0.4
Gas	0	0	0.1	0	0	0
Paraffin	1	1.2	0.7	85.7	92.5	46.5
Others	1	1	0.5	1.3	1.6	0.3
Candles	0	0	0	3.2	1.1	15.3

Source : Malawi Census Main Report, 2009

Households account for 83% of all energy consumption, with industry taking 12%, transport taking 4% and the service sector taking 1%. Transport accounts for 95% of all petroleum products. A pipeline for transport fuel imports could reduce the overall cost of fuel, but the volumes, currently and in the future, do not justify a petroleum pipeline. Since transport accounts for nearly all such fuel there would be no potential co-beneficiaries.

Table 11.4 Total energy demand by sector by fuel in Malawi in 2008

	Energy demand by fuel type				
Sector	**Biomass**	**Coal**	**Electricity**	**Petroleum**	**Total**
Household	127,574	5	1,798	672	**130,049**
Industry	10,004	3,481	2,010	3,130	**18,625**
Transport	270	15	35	5,640	**5,960**
Service	452	174	477	558	**1,661**
Total	138,300	3,675	4,320	10,000	**156,295**
% of total	88.5%	2.4%	2.8%	6.4%	

Source: National Biomass Energy Strategy Document, 2009

Hence, it is more appropriate to consider a pipeline for:

- Less polluting fuels;
- Fuel which can be used in sectors other than transport.

A Liquid Petroleum Gas (LPG) pipeline has such potential. If it is linked with a move towards road vehicles that can use LPG, it can also serve in the longer term the much larger household market, particularly for cooking. This would avoid the need to burn charcoal and firewood, thus preserving forests. It would act as a huge mitigation agent against the production of greenhouse gases.

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Hard shoulder being used by non-motorised vehicles

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Malawi National Transport Master Plan

12 Proposed road infrastructure interventions

Road Sub-Sectoral Plan

12 Proposed road infrastructure interventions

The road network has a fundamental role to play in facilitating economic growth and ensuring national security. Economic and population growth forecasts and implications for road network demand, which are outlined in Appendix C, demonstrate that it is essential that the Government takes measures to develop transport infrastructure and services to support anticipated growth. Proposed infrastructure measures are introduced below.

12.1 Road projects to support agriculture

Current performance, forecast growth and related challenges that face the agriculture sector are outlined in section A.2.6 and road infrastructure projects proposed to support the anticipated growth in a sustainable manner are detailed below.

12.1.1 Overview of proposals

Table 12.1 lists rural roads with forecast traffic volumes in excess of 500 vpd in 2036, which are candidates for upgrading. These are intended to reduce transport costs and improve accessibility in rural areas.

Table 12.1 Candidate rural road upgrading projects

No.	Road No.	Length (km)	Name of start	Name of end	District	Region
1	D1	21.1	Zambia border	M9 turn off	Chitipa	North
2	S100	12.7	M26 turnoff	T301 junction	Chitipa	North
3	S100	9.2	T301 junction	T303 junction	Karonga	North
4	M9	48.8	Chendo	Chisenga	Chitipa	North
5	S101	26.8	M26 turnoff	Kopakopa	Chitipa	North
6	U	5.1	Karonga airport road		Karonga	North
7	T305	15.9	T306 junction	D30 junction	Rumphi	North
8	M24	39.3	Rumphi	M9 junction	Rumphi	North
9	S104	9.5	M9 junction	Hewe	Rumphi	North
10	M11	103.5	Chiweta	M5	Nkhtabay	North
11	S108	27.5	Luwazi Road		Nkhtabay	North
12	S108	19.9	Luwazi road	M11 junction	Nkhtabay	North
13	T309	17.1	Ekwendeni	T308	Mzimba	North
14	S105	47.7	Magido road	Chokora	Mzimba	North
15	S110	45.1	Chikangawa	Chinteche	Mzimba	North
16	S107	21.8	M22	Kafukula	Mzimba	North
17	S106	30.9	Euthini	S107	Mzimba	North
18	U	20.9	Kafukula	Ekwendeni	Mzimba	North
19	S112	48.0	Embangweni	Endegeni	Mzimba	North
20	M9	17.2	S111	Euthini	Mzimba	North

Table 12.2

No.	Road No.	Length (km)	Name of start	Name of end	District	Region
21	S113	64.9	M1 through Vipha	M5, Dwangwa	Nkhotakota	North
22	T325	69.3	M1		Kasungu	North
23	S231	50.2	M18	T339	Kasungu	North
24	M18	24.4	Kasungu	Mtanga	Kasungu	North
25	M18	47.8	Malomo	Nkhotakota	Nkhotakota	North
26	T333	34.2	Mkanda	Zambia border	Mchinji	Central
27	T336	22.0	Mkanda	Chikoto	Mchinji	Central
28	s116	21.2	Mchinji	Mponda	Mchinji	Central
29	D119	24.8	Kasiya	Nambuma	Lilongwe	Central
30	s115	17.9	S117	M1	Lilongwe	Central
31	d120	24.0	Nambuma	M1	Lilongwe	Central
32	M16	21.7	m7	m14	Dowa	Central
33	S119	45.1	Dowa	M5	Dowa	Central
34	T356	32.8	M5	Unknown	Salima	Central
35	U	17.2	Unknown	M5 at Mvera	Salima	Central
36	t361	5.9	M1 at Lumbadzi	M14	Lilongwe	Central
37	D189	12.3	Kabwabwa	M1 at Lumbadzi	Lilongwe	Central
38	S122	17.6	Chitedze	T347	Lilongwe	Central
39	U	16.0	Namitete	Zambia border	Lilongwe	Central
40	S124	23.2	Likuni	T346	Lilongwe	Central
41	t346	14.3	S125	S124	Lilongwe	Central
42	S124	42.6	Mitundu	Lobi	Dedza	Central
43	S126	26.7	Lobi	Linthepe	Dedza	Central
44	S371	15.6	Dedza Pottery	Chipasi	Dedza	Central
45	T372	3.4	Chipasi	Kapula	Dedza	Central
46	T373	9.9	Namoni	Nkhoma	Dedza	Central
47	T324	11.0	Mphomwe	Chulu	Kasungu	Central
48	S117	39.0	Kasiye	Santhe	Lilongwe	Central
49	T346	38.5	Kasiye	Namitete	Lilongwe	Central
50	T375	7.3	-	-	-	-
51	T373	15.4	Kapula	D374	Dedza	Central
52	T374	25.2	Kapula	Dedza	Dedza	Central
53	T376	19.0	Mlanda	Mua Mission	Dedza	Central
54	M10	15.4	Mlanda	S127	Dedza	Central
55	S286	115.3	Mirango	M3 at Mangochi	Mangochi	Central

56	T386	8.2	Namwera		Mangochi	Central
57	U	11.5	M3	S151	Mangochi	Central
58	T382	8.5	M10 - Nankumba	T371	Mangochi	Central
59	t381	95.8	M5	S133	Mangochi	Central
60	S280	75.5	M5	Mangochi	Mangochi	Central
61	D251	39.9	S280	Kalembo	Mangochi	Central
62	T383	1.7	S127	S134	Ntcheu	South
63	S134	19.4	T383	T344	Ntcheu	South
64	S275	7.1	T344	Ntcheu	Ntcheu	South
65	U	8.0	M1	S134	Ntcheu	South
66	t380	20.7	M1	Unnamed	Ntcheu	South
67	d240	9.5	Unnamed	M1	Ntcheu	South
68	T399	43.0	M8	M1	Balaka	South
69	S299	32.3	M3	S131	Machinga	South
70	T388	7.3	T397	S135	Mwanza	South
71	S136	22.8	Mwanza	Mozambique border	Mwanza	South
72	S137	58.1	Chileka	Kasapa	Blantyre	South
73	S138	28.7	Chileka	Tedzani	Blantyre	South
74	S146	8.4	S145	M3	Blantyre	South
75	S147	19.8	M4	Phalombe	Phalombe	South
76	T418	17.1	Michiru	M2	Blantyre	South
77	T418	9.8	S152	Michiru	Blantyre	South
78	S152	79.9	Kanjedza	Bangula	Chikwakwa	South
79	t393	43.5	Nsanama	Nayuchi	Machinga	South
Total		2,255.6				

The priority roads for upgrading are proposed to be in these 10 districts as shown in Table 12.2. The 10 districts depicted in Figure 12.1 make up a cumulative 61% of total national crop produ.ction.

Table 12.2 presents proposals for upgrading roads to paved standard.

Figure 12.1 District crop production as a % of national production

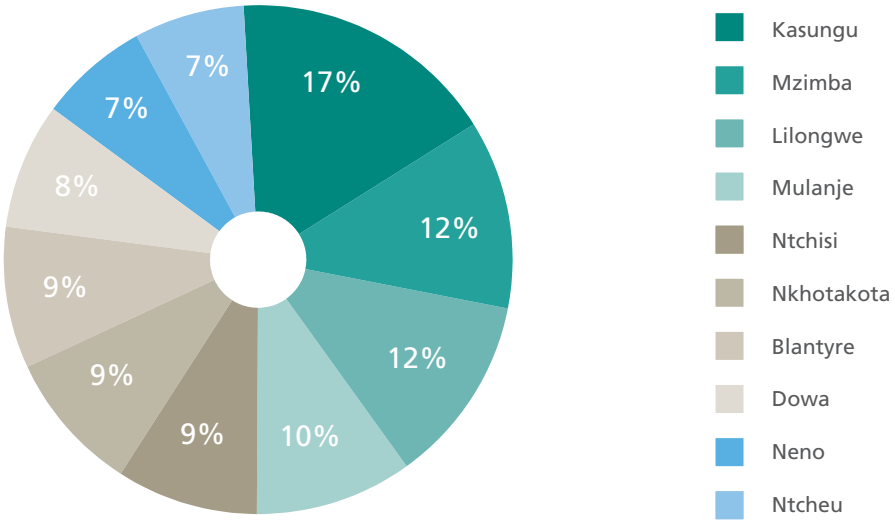


Table 12.2 Proposed rural roads for upgrading

Road No	Name of start	Name of end	Length (km)	Forecast motorised vehicles 2036
S100	M26 turnoff	T301 junction	12.68	378
U	Karonga airport road		5.12	940
T305	T306 junction	D30 junction	15.86	318
M24*	Rumphi	M9 junction	39.29	352
M11	Chiweta	M5	103.52	260
S108	Luwazi road		27.45	718
T309	Ekwendeni	T308	17.12	857
S106	Euthini	S107	30.92	423
D61			20.90	570
S112	Embagweni	Endegeni	48.03	403
M9	S111	Euthini	17.22	451
S101	M26 turnoff	Kopakopa	26.85	344
S113	M1 through Viphya	M5, Dwanga	64.90	183
S231	M18	T389	50.24	371
S125	M1 turnoff	S124	24.42	648
M18	Malomo	Nkhotakota	47.81	551
T333	Mkanda	Chikoto	34.18	909
S116	Mchinji	Mponda	21.21	461
D119	Kasiya	Nambuma	24.81	481
S115	S117	M1	17.88	390
M16	M7	M14	21.72	922
T361	M1 at Lumbadzi	M14	5.88	372
D189	Kabwabwa	M1 at Lumbadzi	12.29	1,356
S122	Chitedze	T347	17.59	1,018
U	Namitete	Zambia border	15.95	932
S124	Likuni	T346	23.20	2,757
S126	Loti	Linthepe	26.73	483
T371	Dedza pottery	Chipasi	15.62	965
T372	Chipasi	Kapula	3.41	907
D220	T374	T372	11.8	224
T375	-	-	7.26	579
T376	Mlanda	Mua Mission	18.98	794
T373	Kapula	T374	15.37	667
T386	Namwera		8.17	1,978
U	M3	S151	11.47	644
T382	M10 - Nankumba	T371	8.52	967
T381	M5	S133	95.80	510
S280	M5	Mangochi	75.54	753
T383	S127	S134	1.74	791

D240	Unnamed	M1	9.53	685
S299	M3	S131	32.27	509
S136	Mwanza	Mozambique border	22.80	1,452
S137	Chileka	Tedzani	58.14	1,170
S146	S145	M3	8.37	1,158
T418	Michiru	M2	17.09	1,617
T418	S152	Michiru	9.83	620
S152	Kanjedza	Bangula	79.91	747
T393	Nsanama	Nyuchi	43.47	1,395
S117	Kasiye	Santhe	39.04	1,055
T346	Kasiye	Namitete	38.46	630
			1,407	

12.1.2 Feeders roads to all farming areas

All agriculture feeder roads that cover the rural areas and provide farmer's ease of access to markets and farming inputs must be developed as listed in Appendix B.

These roads were provided in consultations with DC officials in Blantyre, Balaka, Chitipa, Karonga, Machinga, Mangochi, Mzimba, Nkhotakota, Nsanje, Rumphi and Zomba. The main objective of this programme would be to provide reasonable access to all farming areas by rehabilitating and maintaining full agricultural access roads networks. To this end, the more specific objectives can be listed as:

- To construct new roads or to rehabilitate old roads in key agricultural areas;
- To improve existing agricultural roads and safeguard works against impending deterioration; and
- To routinely maintain (1–2 times yearly) roads that have been rehabilitated.

12.1.3 Access (farm to market) roads for key crops

Malawi's agriculture is composed of two main subsectors: small-scale farmers and estates. Smallholder production is highly subsistent. It is characterized by low levels of input and low output levels. Despite being resource poor, smallholder farmers produce about approximately 80% of Malawi's food and 20% of its agricultural exports.

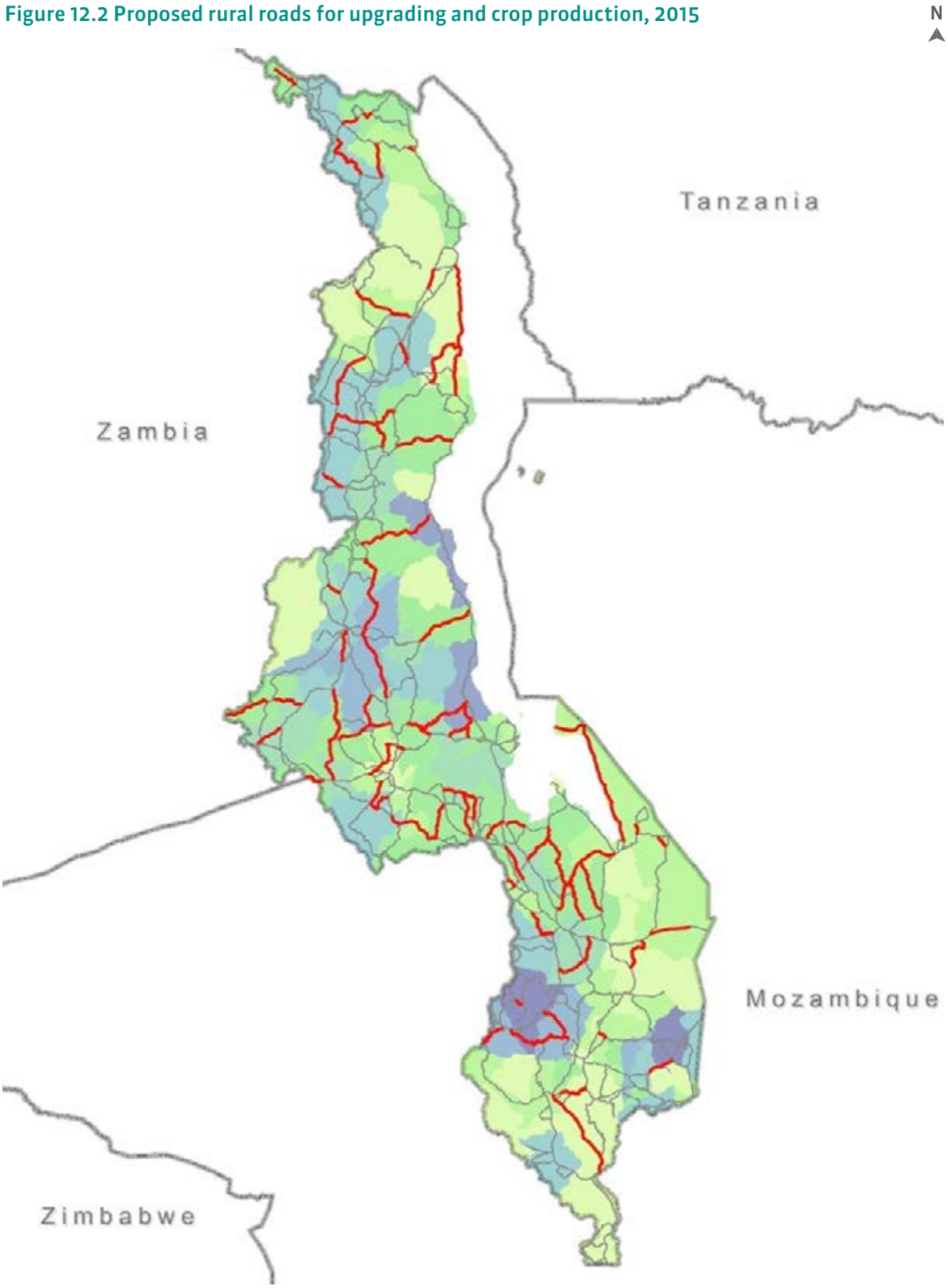
The estate subsector is the nation's principal foreign exchange earner. While it contributes only about 20 % of the total national agricultural production, it provides over 80 % of agricultural exports mainly from tobacco, sugar, tea and, to a lesser extent, coffee and macadamia. The estate subsector for sugar operates on leasehold or freehold land in Nkhotakota, Chikwakwa and Salima and tobacco is largely grown in Kasungu, Mzimba, Lilongwe, Nkhotakota, Ntchisi, Ntcheu and Dedza.

A farm-to-market road is a district road that connects rural or agricultural areas to market areas and or buyers. These will be wider roads that farmers and transporters use to transport products to market towns or distribution centres.

Other interventions include:

- Regulation of prices of transport for key crops to ensure continued production of the crop. Avoid formulation of cartels in the form of transport unions;
- Reduction of taxes on fuel, and vehicle importation and ownership which Agriculture is concerned. More transport choice or competition and higher trucking demand are associated with lower transport costs;
- Improved market facilities and good Government regulations can go a long way in helping poor farmers market and profit from their harvests;
- Financial support from cooperatives and financial institutions to allow farmers to purchase and own their own modes of transport at a subsidized rate; and
- Agriculture district offices in each district should acquire a lorry and / or pickups to allow small holders to hire the same for lower/subsidised fees.

Figure 12.2 Proposed rural roads for upgrading and crop production, 2015



Legend

Total agricultural production (tonnes per year)

- 0 - 50000
- 50001 - 100000
- 100001 - 150000
- 150001 - 200000
- 200001 - 300000
- 300001 - 400000
- 400001 - 500000
- 500001 - 1000000
- Proposed rural roads for upgrading
- Other road network

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National Transport Master Plan

12.2 **Road infrastructure projects to support mining**

The mining sector in Malawi is underdeveloped which is a result of years of very little investment and lack of mineral data. The The Government development strategies have recognised the sector as a priority and have a long-term goal "to increase production and value addition of mineral resources" of the sector. Sectoral context and the mining sector project pipeline are described in section A.2.7, and transport needs identified based on forecast sectoral performance are listed in Table 12.3.

Table 12.3 Road projects for the mining industry

District	Mineral locality	Mineral	Current infrastructure	Transport need
Chitipa	Illomba	Graphite	D2 and M9 roads	Upgrading of district road to tertiary road as a minimum
	Kaseye Mission		D7,D6, D4 and M9 roads	Upgrading of district roads to tertiary as a minimum
	Misuku Hills	Heavy sands	D10, D11, D15 and M26	Upgrading of district roads to tertiary as a minimum
	Ngana			
Karonga	Lufira and Kibwe -	Coal	D19	Upgrading of district roads to tertiary as a minimum
Rumphi	Kaziwiziwi	Coal	T305 road Construction of Njakwa-Livingstonia-Chitima road	Upgrading of road to tertiary as a minimum
Mzimba	Mzimba	Precious and semiprecious stones	M9 and M22	
Mzimba	Majiasawa	Precious and semiprecious stones	M5 and D52	Upgrading of district road
Nkhotakota	Dwangwa	Alluvial gold and aluminium	M5	
Kasungu	Chikoa Livwezi	Limestone	No identifiable infrastructure	
Dowa	Chisepo	Iron sulphide	S117 road	
Nkhotakota	Katengeza	Graphite	M18 and M5	
Lilongwe	Lilongwe	Graphite, iron sulphide, crystalline gypsum	No identifiable infrastructure	
Dedza	Linthipe Mouth	Kaolinitic clays	M1, S126, T372, D220 roads	
Lilongwe	Malingunde	Gold and zinc	T364 and S124 roads	Upgrading of roads
Ntcheu	Golomoti – Malowa Hill	Red and orange garnet	M5 and S127	

District	Mineral locality	Mineral	Current infrastructure	Transport need
Ntcheu	Nkhande, Rivirivi, Dzonze, Kapiridima and Chimwazulu	Kaolinitic clays, corundum and limestone	M1, M5 and M8 roads	
Close to Liwonde train station		Gold, copper, nickel and graphite	M1 road Liwonde train station	
Ntcheu	Likudzi	Gold, copper, nickel and graphite	M1 road	
Liwonde train station		Rare earth elements and strontianite	M1 Liwonde train station	
Balaka	Chenkumbi	Limestone	M8 road Liwonde train station	
Mangochi	Lake Malombe	Natural cement and hydraulic lime	M3 road Liwonde train station	
Zomba	Junguni Hill	Sodalite syenite and nepheline syenite	No identifiable infrastructure	
Zomba	Mongolowe Hills	Nepheline synenite	M3 and S131 roads	
Zomba	Lake Chirwa	Heavy mineral sands	S143 and T404 M3 to Liwonde and Limbe	
Zomba	Changalume	Limestone		
Zomba	Chingale	Phosphate		
Neno	Matope	Marble	M1 and T416	
Neno	Lisungwe	Platinum group metals	D313 and M6	
Mwanza	Nsengwa	Rare earth elements	S136	
Blantyre	Lirangwe	Marble	M1	
Blantyre	Mindale Hill	Iron ore	M1	
Phalombe	Tundulu	Rare earth elements, pyrochlone – carbonatite, phosphate, soevite	S147	Upgrading of roads
Phalombe	Nkalonje	Rare earth elements	S147	Upgrading of roads
Phalombe	Songwe Hill	Rare earth elements	S147	Upgrading of roads
Mulanje	Chambe Basin	Rare earth elements	No identifiable infrastructure	
Mwanza	Thambani	Niobium and uranium	No identifiable infrastructure	
Nsanje	Tengani	Titanium	M1	

12.3 Road infrastructure projects to support tourism

An overview of the potential for growth in Malawi's tourism industry is provided in section A.1.2. It is forecast to grow by 4%, in terms of contribution to GDP, on average per year for each of the next ten years.

Malawi's main tourist attractions are listed in Table 12.4, which also shows the current transport options available to reach each destination.

Table 12.4 Malawi's main tourist attractions

Attraction	Major access points	Transport
Lake Malawi	Nkhata Bay	Road, M5, Lake Services
	Salima	Road, M14, S122
	Mangochi	Air, Road, M10
	Monkey Bay	Road M10, S128, Lake Services
	Nkhotakota	Road, M5, Lake Services
Nyika National Park	Rumphi – Thazima Gate	Road, unpaved
Nkhotakota National Park		Air, Road, M18
Kasungu National Park	Kasungu	M1, S118, potholed road, and gravel road in Park
Liwonde National Park	Liwonde	M3, 14km unpaved road, M8, 30km unpaved road
Majete Game Reserve	Chikwawa	S136, paved
Mulanje Mountain Reserve	Mulanje	M2
Lengwe National Park	Chikwawa	M1, paved roads
Likoma Island	KIA, Lake ports	Air, Lake Services
Mwabvi Wildlife Reserve	Bangula	M1
Namizimu Forest Reserve	East of Mangochi	Road, 3km unpaved
Vwaza Marsh Reserve		M8

In this context, additional roads that will require interventions are:

- Nthalire to Chitipa; banks on either side of the road significantly high;
- Rumphi - Nyika – Chitipa – Misuku road;
- Nkhata Bay-Mzuzu; excessive deforestation in the area leads to heavy rains always washing the road away;
- Nkhata Bay-Salima; sections of the road in poor condition (along Nkhotakota road), especially with frequent passing of overloaded trucks;
- Upgrading of the following access roads:
  - Salima – Senga - Maganga roads 40 km;
  - Cape Maclear and Kasankha Bay road 26km to bitumen;
  - Liwonde Mnsanama to Mvuu Camp Road (3km bitumen and 30km all weather);
  - Off Rumphi -Nyika – Chitipa Road to Chelinda Camp (20km all weather);
  - Chitimba – Livingstonia road (17km Bitumen);
  - Bua T-Off - Nkhotakota Wildlife Reserve (100km all-weather);
  - Kasungu – Lifupa (70km all weather);
  - Dedza to Chongoni Art Site (15km Bitumen);
  - Bunda T—off to Tsang'oma Rain shrine (10km grading);
  - Namwera –Fort Mangochi (15km all weather);
  - Grading of all earth roads within strategic protected areas of Nyika, Vwaza, Kasungu, Nkhotakota and Liwonde (1000km);
  - Old Bandawe Missions in Nkhatabay (10km all weather to M5 Lakeshore);

- Fort Lister Slave Trade from Phalombe (15km all weather);
- Chitipa- Nakonde Road (Nakonde Corridor);
- Senga Bay-Mafco through Maganga to Salima; and
- Likuni - Dzalanyama OR Mchinji Road – Dzalanyama Forest Reserve.

12.4 Toll roads

The PPPC commissioned a report entitled "Feasibility Study on Toll Roads in Malawi", which assessed the feasibility of tolling existing roads with a view to enhancing maintenance funds.[17]

This report concluded that "... tolling does not provide an effective and efficient solution to funding the maintenance backlog. The real value driver is the more efficient and effective use of funds by leveraging in private sector skills, experience and innovation. While tolling of the internal road network is not recommended at this stage, there appears to be potential for taxing foreign light vehicles at the border posts and the RFA is currently investigating this."

The report added: "While tolling will add to the available road funding, it will place a large portion of the financial burden on the lower income urban commuters that live in the peri-urban areas surrounding the cities. Furthermore, the quantum of funds recovered through tolling is expected to be similar to funds already extracted from road users in the form of a rural electrification levy. Therefore, it is recommended that tolling not be considered as a source of additional road maintenance funding but that the rural electrification levy be phased out and transferred to the road fund."

It is recommended that tolling is appropriate on new roads, where a clear and obvious benefit is being provided to the road user, and where there is an alternative route available to those unwilling to pay the toll. In such cases toll revenue should be retained within the financial confines of the new project and used to finance operating and maintenance costs, and capital expenditure where possible. Where toll revenue is insufficient to meet all capital operating costs the public sector may contribute, so long as the economic benefits of the scheme outweigh the funding gap. In such a case, a PPP is an appropriate delivery vehicle.

Potential candidates for toll roads are: Blantyre Elevated Expressway, Lilongwe Western By-pass.

12.5 Road safety projects

Improving road safety is a high priority in this plan. Specific road infrastructure projects were developed from a review of overall road crashes, along with the existing and future demand for motorised and non-motorised transport on these roads, all designed to improve safety. The schemes all propose the introduction of segregated non-motorised transport lanes, primarily to protect cyclists and pedestrians from motorised traffic on the following roads:

- M12 from Lilongwe to Mchinji (90km);
- M1 Mponela to Dedza (120km);
- M1 Dedza to Blantyre (198km);
- M6 Blantyre to Mwanza (95km);
- S143 (10km), Zomba and
- S108 (10km), Mzuzu

Table 12.5 presents the proposed measures to improve road safety.

17 SMEC, 2016

Table 12.5: National Transport Masterplan Action Plan for road safety

Attraction	Major access points	Transport
Comprehensive education and awareness campaign that targets all categories of road user;	Develop specific awareness programmes and packages aimed at: • Motorised vehicle drivers • Cyclists • Pedestrians	Promote awareness through continual TV, radio, newspaper and poster campaigns throughout 20 year plan period
Improve the speed and standard of accident response	Introduce toll free telephone number for accident reporting Procure ambulances and develop trauma centres on M1	Ensure GPS reporting of crash sites and connections between police and ambulance services Roll out trauma centres/ambulances across the country
Link Malawi's Road Traffic Accident (RTA) system with the Malawi Traffic Information System (MalTIS)	Link crash data to vehicle and driver fields in Maltis	Provide aggregate data to stakeholders
Strengthen leadership and co-ordination in road safety	Commission study on costs and benefits of a National Road Safety Authority	
Improve road signing and markings	Review traffic signs and road markings in light of international experience and best practice	Ensure signs and markings explicitly included in road agency budgets
Reinstate road safety in primary school curriculum	Consult with Ministry of Education	Prepare and update training materials and brochures. Train trainers for teachers
Introduce theory course for all new drivers	Prepare regulation and course material	Ensure issuance of provisional license on course attendance
Issue based awareness and enforcement	Design awareness programmes of key issues: drink driving, speeding etc. Consult with Traffic Police to ensure enforcement campaigns carried out at same time	Repeat annually

Heavy trucks to and from Mozambique through Dedza border area

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Malawi National Transport Master Plan

13 Road maintenance and rehabilitation

Road Sub-Sectoral Plan

13 Road maintenance and rehabilitation

13.1 Road maintenance programme

The 2017/18 Annual National Roads Programme (ANRP) sets out the maintenance plans and spending for the financial year 2017/18.

Table 13.1 Road maintenance plans, 2017/18

Works programme description	Unit	Amount	Cost (US$ million)
Cyclic Maintenance	Km	15,853	2,466
Grading / Reshaping	Km	4,795	2,549
Pothole Patching on Paved Roads	m2	99,800	1,328
Road Centre and Edge Lines Marking	Km	2,003	1,212
Accident Spots Improvement	Lump sum	-	409
Road Signs Replacement / Marking	Lump sum	-	86
Spot Repair Interventions	Lump sum	-	4,108
Routine and Periodic Maintenance (Tracks and Trails)	Lump sum	-	696
Sectional Periodic Maintenance of Paved Roads	Km	100	10,938
Sectional Rehabilitation of Paved Roads	Km	-	-
Shoulder Reconditioning of Paved Roads	Km	20	1,573
Rehabilitation of Unpaved Roads	Km	15	2,360
Replacement of Timber and Bailey Bridges with Concrete Decks	M	209	556
Total			**28,281**

Source: Roads Authority

The total planned maintenance budget for 2017/18 is US$28,281 million, of which US$14,3 million is allocated for the paved network, and within that, US$13,9 million allocated for periodic maintenance. This is first time since 2011 that periodic maintenance will be undertaken.

Table 13.2 lists the overall network statistics for the paved MST network 2007 and 2014 to 2015, when the last condition survey was carried out. Traffic has grown by 8.5% annually. Whilst the average IRI has dropped only 0.5% over seven years, the proportion of roads in 'good' condition (IRI<3.5) fell from 58% to 31%.

Table 13.2 Paved network overview

Year	Total km	AADT	Average IRI	IRI			
				<3.5	3.5-5.0	5.0-7.0	>7.0
2014-15	2,931	1,268	4.0	31%	57%	9%	3%
2007	2,924	660	3.5	58%	28%	13%	1%

Source: Roads Authority and TRL HDM-4 Database
AADT and IRI weighted by section lengths
Incomplete data

The paved network was divided into three traffic and three conditions bands, and the percentages of the network in each band are shown in Table 13.3. Over 50km of the highest traffic band is on poor condition, and hence a major cause for concern.

Table 13.3 Paved network condition and traffic levels, 2014

Traffic	Good, IRI< 3,5	Fair, 3.5<IRI<5.0	Poor, IRI>5.0	Total km
>1,000 vehicles/day	14.5	17.8	5.1	1,094
250-1,000 vehicles/day	12.6	31.5	4.9	1,434
<250 vehicles/day	6.2	4.3	3.2	403
Total km	976	1,569	**386**	**2,931**

Note: Total MST paved roads km in RA database less than actual total

Table 13.4 reveals that over 80km on the M1 are currently in poor condition. All the sections listed are likely to merit intervention, since their conditions are worst, and traffic highest, across the network. No interventions, other than routine maintenance have been carried out on the paved network since 2011.

Table 13.4 Road sections in poor condition with high and medium levels of traffic

Region	Road	Km	AADT (2015)	IRI (2014)
South	M1	32	1,400	6.4
	M2	6	5,800	7.5
	M3	56	2,300	6.0
	M4	7	6,300	5.4
	S131	11	1,800	6.4
	S137	7	8,300	6.5
Central	M1	23	4,600	5.6
	M5	7	630	6.0
	M12	5	5,000	5.5
	S125	12	2,700	5.5
North	M1	26	420	6.0
	M5	11	560	5.8
	M24	61	500	5.4

Road maintenance funding

In the road sub-sector, as detailed in section 8.1, the main source of recurrent funding is from the Road Fund. The 2016/17 budget provides for an allocation for road maintenance of MWK 20.6 billion. This is intended to split between national roads (MWK12.6 billion) and urban roads (MWK 8 billion). The fuel levy, collected by MERA, is routed directly to the RFA's account. The overall allocation for road maintenance is therefore non-discretionary with funding being legally ring-fenced. Thus the funding source for road maintenance is sustainable.

The fuel levy is forecast to raise MWK 23 billion in 2016/17. The levy provides a reasonably predictable source of funds, and is sustainable to the extent that it should continue to contribute an increasing source of funds for road maintenance over the next 20 years. However, since this source, set as a percentage of the pump price of fuel does not fully cover road maintenance needs it is not wholly sustainable.

Current annual maintenance needs for the national and urban road network can be calculated grossly using:

1) 1% of GDP; or
2) 2.5% of the asset value.

The first gives an annual need of US$64 million (MWK46 billion), and the second a value of US$158 million (MWK113 billion). Therefore, the current levy provides between 24% and 64% of present needs. A more detailed analysis will provide a clearer figure of long-run road maintenance needs. In the meantime, in order for the funding mechanism to provide a sustainable source of funds, our preliminary conclusion is that the fuel levy will need to be increased.

It should be noted that MERA is projecting that fuel consumption will only rise marginally in the next few years. As such the fuel levy at present rate may not rise sufficiently to meet the expected increase in maintenance costs.

13.2 HDM4 Analysis

HDM4 provides a harmonised systems approach to road management. It is widely used to analyse road management and investment in one of four modes. These are project appraisal, works programme, strategic planning and software environment.

In the analysis conducted for this plan HDM4 was run in Strategy Mode, which is suited to supporting policy development, long-term resource allocation plans and road network planning. It was run for the paved MST network with an unconstrained budget, over the period 2016 to 2035, with major works programmed to start (realistically) in 2018. The following are the findings:

1. The recommended investment in capital maintenance averaged US$64 million per year, with an additional requirement of US$90 million for recurrent activities over the whole period;
2. This resulted in a long run average IRI across the network between 4.1 and 5.5, representing the most efficient use of the resources;
3. Of the required total expenditure of US$1,280 million[18] over the analysis period, around US$167 million is recommended for the reconstruction of 334km of roads. If the cost of reconstruction is removed from the long run maintenance need, the total average annual requirement becomes US$59.7 million; and
4. When applied to whole MST paved network of 3,533 km, this gives a total cost of US$72.0 million annually.

HDM4 was then run in constrained mode with annual budget limit of US$30 million annually. This resulted in an average end state IRI across the paved MST network of 7.3, with a total additional recurrent requirement of US$93 million. The total cost for the MST paved network would be US$42.4 million annually.

HDM4 was run to assess the impact of the proposed interventions for 2017/18, along with higher cost interventions designed to address the priority areas of deterioration in the network. The scenarios tested are shown in Table 13.5, along with average annual costs.

Table 13.5 HDM4 scenarios tested, HDM paved network

Test No.	Maintenance regime	Average annual cost (US$ million)
1	Do Nothing	0
2	Regime Planned for 2017/18	19
3	Crack Sealing on all sections	31
4	Crack Sealing on Sections > 2,500 AADT	20
5	Slurry Seal and overlays	24
6	Overlays and limited reconstruction	34

The outcomes of the above scenario tests are shown in Table 13.6

Table 13.6 Comparison of HDM4 scenarios

Test No.	Average network IRI	Average pavement IRI by traffic category (AADT)			
		>5,000	2,500 to 5,000	1,000 to 2,500	500 to 1,000
1	16.0	16.0	16.0	16.0	16.0
2	7.5	15.4	9.4	7.5	6.9
3	6.8	9.0	7.4	6.7	6.5
4	7.2	9.0	7.4	7.5	6.9
5	6.7	8.2	6.9	6.8	6.3
6	6.3	5.9	6.1	5.8	6.2

18 Expended over less than 20 years, as any recommended works could not start until 2018.

Table 13.7 Maintenance regime cost vs outcome, whole MST paved network

Test No.	Test	Average annual cost (US$ million)	Outcome IRI
1	Do Nothing	0.0	16.0
2	Regime Planned for 2017/18	19.0	7.5
3	Crack Sealing on all sections	37.4	6.8
4	Crack Sealing on Sections > 2,500 AADT	24.1	7.2
5	Slurry Seal and overlays	28.9	6.7
6	Overlays and limited reconstruction	41.0	6.3
7	Constrained Strategy	42.4	7.3
8	Unconstrained Strategy	72.0	4.8

The Unconstrained Strategy provides the best long-term outcome for the paved network. The annual cost is equivalent to around 2.2% of the value of the paved MST network.

There is insufficient data for HDM4 to be run on the remaining, mainly unpaved, network. As a result, it has been assumed 2.2% of the asset value of the remaining network to represent the average annual maintenance need. This equates to US$68.5 million. The total road maintenance need for the paved and unpaved networks is US$140.5 million (equivalent to MWK 101.2 billion). This is 3.6 times the allocation for 2017/18. The implications of reduced levels of expenditure below this optimum as shown in Table 13.8.

Table 13.8 Outcomes for varying levels of maintenance expenditure

Percentage of required maintenance expenditure on paved roads	Average IRI
100% (unconstrained strategy)	4.8
59% (constrained strategy)	7.3
26% (Regime planned for 2017/18)	7.5

A cost-benefit comparison for the various tests is shown in Table 13.9. It shows that test 4 provides the best value for money, followed by test 2, the regime planned by the Roads Authority for 2017/18.

Table 13.9 Economic appraisal of maintenance interventions

No.	Test	NPV/C
2	Regime Planned for 2017/18	23.3
3	Crack Sealing on all sections	14.9
4	Crack Sealing on Sections > 2,500 AADT	27.0
5	Slurry Seal and overlays	9.6
6	Overlays and limited reconstruction	11.5
8	Unconstrained	13.9

The long run maintenance needs of the network can be compared to the allocations provided in the draft 2017/18 expenditure plan, as shown in Table 13.10.

Table 13.10 Road maintenance needs and allocation, US$ million annually

	Annual needs			2017/18 Plan		
	MST paved	Other	Total	MST paved	Other	Total
Routine	6.0	5.7	11.8		7.0	7.0
Periodic	66.0	62.8	128.7	17.4	14.9	32.3
Total	**72.0**	**68.5**	**140.5**		**39.3**	**39.3**

The resultant recommendations for periodic maintenance are shown in Table 13.11.

Table 13.11 Periodic maintenance interventions from HDM4

Year	Length (km)	Cost (US$ million)
2018	608	112.2
2019	46	8.3
2020	732	134.6
2021	307	63.0
2022	270	48.6
2023	0	0
2024	98	17.3
2025	148	29.7
2026	639	115.0
2027	456	82.1
2028	7	0.6
2029	270	55.4
2030	270	48.6
2031	68	12.2
2032	0	0
2033	80	11.1
2034	408	73.4
2035	639	115.0
2036	0	0
2037	278	57.8

13.2 Road rehabilitation

The unconstrained HDM4 strategy run recommended 167 km of road rehabilitation as summarised in Table 13.12.

Table 13.12 Road reconstruction lengths by recommended year

Year	Total km
2018	7
2019	11
2023	32
2030	107
2034	18
2036	67
2037	69
Total	**334**

In the HDM4 Strategy Test, roads were grouped into sections according to roughness and traffic as shown in Table 13.13.

Table 13.13 Traffic and roughness categories for HDM4 strategy run

Traffic category	Roughness category									
	R1		R2		R3		R4		R5	
	AAADT	IRI	AADT	IRI	AADT	IRI	AADT	IRI	AADT	IRI
T4	1,742	2.8	1,637	4.1	1,692	5.5	1,663	6.4	1,491	7.6
T5	3,330	2.8	3,233	5.4	3,476	5.4	2,743	6.5	2,949	8.4
T6	9,548	2.4	9,164	4.0	8,875	5.3	13,554	6.6	8,241	8.8

The resultant reconstruction lengths in each category are shown in Table 13.14.

Table 13.14 Road reconstruction lengths (km) by traffic and roughness category

	R1	R2	R3	R4	R5	Total
T4	0	0	0	19	14	**33**
T5	93	69	23	13	5	**203**
T6	27	33	12	12	14	**98**
Total	**120**	**102**	**35**	**44**	**33**	**334**

Ongoing road rehabilitation/reconstruction projects are listed in Table 13.15

Table 13.15 Ongoing rehabilitation projects

Name	Funding agency	Length (km)	Completion
Mzuzu-Nkhata Bay	AfDB	47	2017-2022
Liwonde-Mangochi	AfDB	75	2017-2022
Blantyre-Zomba endpoints	AfDB	60	2017-2022
Karonga-Songwe	WB	45	2017-2022
Total		**227**	

Source: RA, 2017

Ongoing upgrading projects are listed in Table 13.16.

Table 13.16 Ongoing upgrading projects

Name	Funding agency	Length (km)	Completion
Chiringa-Chiradzulu*	GoM	80	2017-2022
Lilongwe old airport – Kasiya Santhe (S117)	GoM	95	2017-2022
Jenda-Edingeni	GoM and Abu-Dhabi Fund for Development	38	2017-2022
Zomba-Jali-Phalombe-Chitakale (S144, S147, S148)	Kuwait Fund , BADEA and OFID	51	2017-2022
Thyolo – Thekerani – Makhanga (S151)	Kuwait Fund , BADEA and OFID	82	2017-2022
Chikwawa – Chapananga (S136)	GoM	47	2022-2027
Lirangwe-Chingale-Machinga (S139)	Kuwait Fund , BADEA and OFID	62	2022-2027
Lumbadzi-Dowa-Chezi (M7/M16)	GoM	18	2017-2022
Mzimba-Mzalangwe	GoM	62	2022-2027
Ntcheu-Tsangano-Neno-Mwanza turn-off (S118)	Government of China	140	2022-2027

Njakwa Livingstonia – Chitimba (S103)	GoM	75	2022-2027
Msulira – Nkhotakota (M5)	GoM	33	2027-2032

* Completed 2017

Ongoing and proposed road improvement projects are shown in Table 13.17.

Table 13.17 **Road improvement projects**

Name	Funding agency	Length (km)	Completion
Illovo roundabout to Midima roundabout (M2) – dualling	GoM	0.5	2017-2022
Area18 roundabout - Area 49 at Kaunda Road Junction -widening	GoM	3	2017-2022
Area18 roundabout - Parliament roundabout - KCH - Amina House – dualling	GoM	4.2	2017-2022
Kaunda - Chendawa and Area 25 - Nzenza – M1 Junction - widening	GoM	20	2017-2022
KIA turn off to Bunda turn off (M1): (i) KIA turn off to Kanengo (ii) Kanengo to Mchinji Road roundabout (iii) Mchinji Road roundabout to BIWI (iv) BIWI to Bunda turn off	GoM/JICA/China	14	2017-2022

Proposed rehabilitation projects are listed in Table 13.18. These reflect priorities on the main road network.

Table 13.18 **Potential rehabilitation projects**

Road name	Funding agency	Length (km)	Completion
Nsanje-Marka (M1)	GoM	30	2022-2027
Ntcheu-Kasinje (M5)	GoM	50	2022-2027
KIA Junction-Kasungu-Jenda-Mzimba turn-off (M1)	COMESA	234	2022-2027
Mangochi-Chiponde (M3)	AfDB	138	2022-2027
Mzimba turn-off -Mzuzu-Kacheche (M1)	WB	138	2022-2027
Nsipe-Liwonde (M8)	GoM	55	2022-2027
Balaka-Salima (M5)	GoM	200	2022-2027
Kapatenga-Nkhotokota-Dwangwa (M5)	Chinese Government and GoM	150	2022-2027
Chiweta-Bwengu-Kacheche	World Bank and European Investment Bank	63	2022-2027
Rumphi-Hewe-Zambia Border (M24)	AfDB	65	2022-2027
Mangochi-Makanjira (S256)	Chinese Government and GoM	138	2022-2027

Source: RA – Schemes under design or feasibility, 2017

The M3 towards Zomba - good pavement condition and road markings

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Malawi National Transport Master Plan

14 Implementation plan

Road Sub-Sectoral Plan

14 Implementation plan

14.1 Programme implementation

Table 14.1 lists the sub-sector plan costs and implementation phases. Some schemes appear in more than one plan. There are blanks in the table below where there are no implementation costs, or such costs are covered by internal revenues.

Table 14.1 Roads sub-sector programme cost and implementation

S.I	Programme	FY2017 -FY2022	FY2022 -FY2027	FY2027 -FY2032	FY2032 -FY2037
Major Projects					
1	Rural roads upgrade	75,000,000.00	214,000,000.00	224,000,000.00	195,000,000.00
2	District transport plans	40,000,000.00	56,000,000.00	56,000,000.00	56,000,000.00
3	M12 Safety project	30,000,000.00	-	-	-
4	M1 Safety projects	-	70,000,000.00	-	-
5	M1 Dualling	-	-	50,000,000.00	300,000,000.00
6	Lilongwe Western Bypass	-	40,000,000.00	-	-
7	Lilongwe Eastern Bypass	-	-	70,000,000.00	-
8	Mthandizi - Mpingwe (Blantyre)	-	8,000,000.00	-	-
9	Misesa - Soche Hill - Manja (Blantyre)	-	-	9,000,000.00	-
10	Blantyre Inner Relief Road	-	-	100,000,000.00	-
11	Blantyre elevated expressway	-	-	-	182,000,000.00
Minor Capital works and Programmes					
12	Reconstruction (ongoing)	150,000,000.00	-	-	-
13	Planned Reconstruction	9,000,000.00	21,500,000.00	54,000,000.00	82,500,000.00
14	Major works (Commited	197,000,000.00	-	-	-
15	Major works (Planned)	40,000,000.00	125,000,000.00	105,000,000.00	85,000,000.00
16	Road maintenance	700,000,000.00	700,000,000.00	700,000,000.00	700,000,000.00
17	Level crossings	10,000,000.00	10,000,000.00	10,000,000.00	-
18	Increase fuel levy to 20% of pump price	-	-	-	-
19	Remove all other levies and give only to road	-	-	-	-
20	Road tolls	-	-	-	-
21	Agriculture cess	-	-	-	-
22	Ring fence RFA income for rural roads	-	-	-	-
23	Sponsorship of road maintenance	100,000.00	-	-	-
24	Carbon tax	-	-	-	-
25	Data analytics and technology	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00
26	Education and awareness	2,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00
27	Link RTA system, with MALTIS	1,000,000.00	-	-	-
28	Ring fence traffic fines	-	-	-	-
29	Increase insurance surcharge	-	-	-	-

S.I	Programme	FY2017 - FY2022	FY2022 -FY2027	FY2027 -FY2032	FY2032 -FY2037
30	Signs and markings	1,000,000.00	2,000,000.00	2,000,000.00	2,000,000.00
31	Road safety in school curriculum	2,000,000.00	2,000,000.00	-	-
32	Road safety clubs in schools	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00
33	Public awareness	2,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00
34	Issue based enforcement	3,000,000.00	5,000,000.00	7,000,000.00	7,000,000.00
35	Design standards - all other roads	500,000.00	-	-	-
36	Street lighting	4,000,000.00	5,000,000.00	6,000,000.00	7,000,000.00
37	Rest stops	80,000.00	400,000.00	400,000.00	-
38	Climbing lanes	-	4,000,000.00	8,000,000.00	-
39	Automation of processes and systems	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00
40	Sensitization	500,000.00	500,000.00	500,000.00	500,000.00
41	CCTV	5,000,000.00	-	-	-
42	Inland weighbridge stations	-	6,000,000.00	6,000,000.00	-
43	Fuel gas pipeline feasibility study	500,000.00	-	-	-
District transport infrastructure and management					
44	District road safety councils	2,000,000.00	2,000,000.00	2,000,000.00	2,000,000.00
45	Capacity building for districts	4,500,000.00	-	-	-
46	NMT facilities and integrated cycle lanes	-	10,000,000.00	10,000,000.00	10,000,000.00
Institutional and regulatory					
47	Road Traffic Authority (RTA) establish	3,000,000.00	-	-	-
48	RTA running costs	2,500,000.00	2,500,000.00	2,500,000.00	2,500,000.00
49	National road safety authority (NRSA)	2,000,000.00	-	-	-
50	NRSA running costs	750,000.00	750,000.00	750,000.00	750,000.00
51	Legislation review and update	500,000.00	-	-	-
52	Strengthen MoTPW	500,000.00	-	-	-
53	Establish rural transport working group	500,000.00	100,000.00	100,000.00	100,000.00
54	Establish road haulage industry council	500,000.00	-	-	-

14.2 Enabling actions

Table 14.2 lists the preparatory actions for the roads sub sector.

Table 14.2 **Preparatory action plan**

Action	2017-2022	2022-2027	2027-2032
Detailed justification for RHIC	x		
Cabinet paper for RHIC	x		
Cabinet paper for Carbon tax	x		
Establish traffic police/DRTSS coordination committee - Chaired by Minister to coordinate enforcement	x		
Constitute private sector partnership for road safety funding and initiatives	x		
Cabinet paper to amend Road Traffic Act	x		
Paper of agricultural profit tax	x		
Constitute private sector partnership for sponsoring routine maintenance	x		
Comprehensive safety campaigns	x		
Strengthen road safety leadership and coordination	x		
Primary school road safety curriculum	x		
Train trainers in Teachers Training Colleges	x		
Design guidelines for urban roads and transport	x		
Theory course on driving for provisional licence holders	x		
Review status of all level crossings	x		
Amend geometric standards to better protect NMT	x		
Adopt Universal Design Principles	x		
Develop modalities for District Transport Plans	x		
Adopt new road classification in Roads Act	x		
Let consultancy contract for Rural Transport Master Plan	x		
Develop strategy for alternative fuel use	x		
Establish inter-ministerial rural transport working group	x		
Procure CCTV for weigh bridges	x		
Research fuel gas pipeline	x		
Detailed feasibility and design for rural road upgrade programme	x		
Establish inter-ministerial transport and mining working group	x		
Establish inter-ministerial transport and tourism working group	x		
Detailed design for Lilongwe Western bypass	x		
Appoint Transaction Adviser for Lilongwe Eastern Bypass	x		
Detailed design of M12 safety projects	x		
Detailed design of other main roads safety projects	x		
Feasibility and design of Blantyre bypasses and relief roads	x		
Feasibility and design of Blantyre elevated expressway		x	
Asset management strategy	x		
Pilot performance based maintenance contract	x		
Asses potential for Contractor Facilitated Finance projects		x	

Bycicle taxi on the M1 through Mzuzu

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Malawi National Transport Master Plan

Appendices

Road Sub-Sectoral Plan

Appendix A: **Policy and strategy review**

The 2015 National Transport Policy (NTP), as introduced in Chapter 9, contains eight priority areas[19], each of which contain policies and strategies for the road sub-sector. The key policies, for which this Plan contains proposals to supplement, are listed below.

Transport infrastructure

Table A.1 shows road sub-sector related policy objectives identified for transport infrastructure, the key strategies and a brief commentary.

Table A.1 Transport infrastructure – polices and strategies

Policy objectives	Key strategies	Remarks
To ensure the road network remains in good condition	▪ Introduce road tolls	Will increase transport costs, but moving towards international norms that user should pay full costs
To ensure use of appropriate road designs	▪ Review the current standards e.g. standard specification for roads & bridges (MoW 1987), SATCC Design standards	Possible move away from current international standards, but required to address NMT issues
To improve access to markets and social amenities and ensure value for money in construction of roads	▪ Secure funding for the construction of economically justified road programmes and projects	Economic justification may rule interventions to meet social needs
To improve the effectiveness of planning of local roads and deliver the best value for money from investment	▪ Improve and implement axle load control strategy	Vital to adhere to international protocols, but implementation is still weak
To ensure efficient operations of agencies in the roads sub-sector	▪ Review the existing regulatory frameworks to be in line with prevailing environment ▪ Strengthen Local Authorities	
To improve mobility in urban areas	▪ Undertake a feasibility study on the development of rail based urban transport systems	Poor strategy. Others needed in short/medium term
To improve the effectiveness of planning of local roads and deliver the best value for money from investment	▪ Develop simplified prioritisation tools based on traffic flow (motorised and Non- Motorised Transport (NMT)) social facilities and population served and/or agricultural production	Good strategy but is in conflict with strategy for economically justified road programmes

19 The eight priority areas of the NTP are: transport infrastructure; transport services provision; Non-Motorised Transport (NMT); international transport corridors; private sector participation; good governance; strengthening of institutional framework, and; crosscutting issues.

Policy objectives	Key strategies	Remarks
To improve the effectiveness of management of local roads and deliver the best value for money from investment	▪ Review alternative forms of maintenance management and mechanisms for funding ▪ Establish standard procedures for inspection of district & community roads ▪ Train local authority staff in use of guidelines & standards	Requires more funding, and hence alternative forms if funding is a good strategy
To engender a sense of ownership by the community of local roads and to ensure that investment contributes to the local economy and addresses gender balance issues	▪ Strengthen and expand village road maintenance clubs to ensure equitable representation of women	
To enable safe and convenient movement of people and goods from farm to market and home to social and economic centres	▪ Develop a specific Policy for Non-Motorised Transport ▪ Review all road standards to ensure adequate provision made for NMT ▪ Develop standard road safety and NMT provisions for trading centres	Strategy to fully maintain rural roads also required
To ensure adequate funding for routine and periodic maintenance of the urban road network	▪ Develop simplified analysis tools based on traffic flow and visual assessment of road and drainage condition ▪ Undertake annual surveys of road and drainage condition	Strategy to be reviewed in more detail in NTMP
To reduce transport costs through reducing journey times and vehicle operating costs	▪ Develop and implement prioritised programmes of junction improvements in major urban centres ▪ Develop capacity in City and Urban Councils for management of signalised junctions	Policy is for urban areas only. Strategy should focus on low cost-high impact interventions
To enable safe and convenient movement of people and goods in urban areas	▪ Improve the provision for pedestrians and cyclists in urban road standards	
To improve the quality of urban roads and reduce urban transport costs	▪ Develop simplified evaluation tools based on traffic and pedestrian levels, population served and commercial and/or industrial activity	To be reviewed further in NTMP
To improve the efficiency of public transport services and reduce their impact on the traffic flow for other road users	▪ Undertake a public transport demand study in major urban areas including identification of necessary infrastructure	Priority for policy and strategy should be legal, regulatory and institutional arrangements for urban public transport

Transport services provision

Table A.2 shows road sub-sector related policy objectives identified for transport services provision, the key strategies and a brief commentary.

Table A.2 Transport Services Provision – polices and strategies

Policy objective	Key strategies	Remarks
To improve service provision	▪ Consider outsourcing operations such as vehicle inspection	The general strategy should be to tighten up regulatory controls, as well as further outsourcing
To enhance law enforcement	▪ Review penalties for traffic offences ▪ Review road traffic act	Strategy should be more specifically aimed at specific offences
To promote bilateral and multilateral cooperation	▪ Harmonise the highway code with that of the region ▪ Implement agreements from bilateral, regional and international road transport and traffic conventions ▪ Review bilateral and multilateral road transport agreements	Important strategies to meet international norms
To promote safety on the designated road network	▪ Develop and implement national road safety strategy ▪ Intensify awareness campaigns ▪ Improve the accident database ▪ Expand school safety programs ▪ Enhance and standardise driver training ▪ Increase training and education of cyclists ▪ Intensify motorcycle rider training	A road safety action plan exists, but not a separate road safety policy, which tends to be the international norm
To ensure that road transport operators are aware of their role in the preservation of road infrastructure	▪ Conduct sensitisation workshops to discourage overloading ▪ Vigorously enforce vehicle weight limits and vehicle dimensions	Important to meet international obligations
To improve provision of road transport services	▪ Ensure users pay a fuller share of all costs, while respecting equity concerns ▪ Conduct research on transport needs for major urban areas ▪ Promote development of local transport industry ▪ Ensure that road transport pricing system is determined by market forces	First and fourth strategies
To strengthen regulation of the road transport services	▪ Strengthen coordination with relevant associations in the sub-sector ▪ Review road transport services regulations and licensing ▪ Ensure visibility of passenger vehicles such as taxies and minibuses	The issue of improving co-ordination with the private sector is very important

Policy objective	Key strategies	Remarks
To reduce vehicle operating costs	▪ Engage RBM, MOF&ED and IAM to look at ways of reducing insurance premiums ▪ Request CFTC to monitor the insurance industry	Fuel cost appears to be the biggest component of vehicle operating costs
To strengthen capacity of the private sector	▪ Establish training institutions for transport operators	Needs to be clarified as to whether this is technical, financial or business capacity
To provide a conducive environment for private sector participation in service provision	▪ Review laws, regulations and procedures relating to PPPs ▪ Promote BOT activities ▪ Review tax and tariff regimes to create conducive environment for private sector investment ▪ Include incentives for local participation in the PPP	To be covered in NTMP
To ensure that local people have access to essential services and that disadvantaged and marginalised groups are not discriminated against in transport provision	▪ Develop incentive schemes for rural public transport provision	May go against liberal market principles. Government interventions tend to be limited to road maintenance, and this needs greater resources
To ensure that local people have access to essential services and markets using appropriate and affordable means	▪ Develop a specific Policy for Non-Motorised Transport ▪ Develop district-level programmes to promote the use of IMT	NMT Policy required. Will be recommended in NTMP, along with policy principles
To develop viable proposals for improved public transport measures, including mass transit, aimed at reducing road congestion and improving accessibility for all	▪ Undertake a public transport demand study in major urban areas including options for meeting identified and future demand	Urban (public) transport policy required
To reduce road accidents. Included in NTMP.	▪ Implement the relevant measures included in the National Road Safety Master Plan ▪ Conduct public awareness campaigns ▪ Develop improved standards and facilities for driver training	
To improve accessibility to social and commercial facilities for all members of society	▪ Undertake a gender disaggregate urban transport customer profile and needs ▪ Conduct gender analysis as part of feasibility studies in the development of urban transport infrastructure	NTMP surveys will disaggregate by gender
To improve standards of driving, vehicle safety and comfort in public transport provision	▪ Review the Road Traffic Act ▪ strengthen driver training programme	To be covered partly under Task E4

Non-motorised transport

Table A.3 shows road sub-sector related policy objectives identified for non-motorised transport, the key strategies and a brief commentary.

Table A.3 Non-motorised transport – polices and strategies

Policy Objective	Key strategies	Remarks
To develop appropriate measures for addressing NMT issue	▪ Incorporate NMT in national road safety strategy ▪ Conduct study on NMT in Malawi	Important at policy level to direct NTMP
To apply universal design principles in transport infrastructure	▪ Conduct baseline study on status of NMT inclusion in road designs ▪ Incorporate universal design principles in design manuals for roads ▪ Implement roads maintenance strategy	UDP should be applied to all infrastructure and buildings
To improve road safety	▪ Enforce traffic laws ▪ Incorporate NMT awareness in Driver Training manuals	Mainly an infrastructure issue
To raise awareness of NMT issues	▪ Awareness campaigns	Should be directed at motorised traffic
To improve state of NMT infrastructure	▪ Formulate maintenance strategy for facilities ▪ Lobby for increased financing towards maintenance of NMT infrastructure	Road maintenance planning should be more focussed towards NMT, particularly on the unpaved network. Strategies to be included in NTMP

International transport corridors

Table A.4 shows road sub-sector related policy objectives identified for international transport corridors, the key strategies and a brief commentary.

Table A.4 International transport corridors – polices and strategies

Policy objective	Key strategies	Remarks
To improve coordination in the provision of freight forwarding services by the private sector	▪ Support the private sector in the operations of the Shipper's council ▪ Encourage international shipping investment by private sector	Institutionalise private-public sector dialogue
To facilitate movement of traffic along the corridors	▪ Lobby for funding ▪ Improve infrastructure for hub-points including communication in transit facilitation	Consider special institutional arrangements for corridor management

Private sector participation

Table A.5 shows road sub-sector related policy objectives identified for private sector participation, the key strategies and a brief commentary.

Table A.5 Private sector participation – polices and strategies

Policy objective	Key strategies	Remarks
Policy objective	▪ Undertake scoping study on PPPs in provision of transport services ▪ Provide incentives to the private sector to participate in the provision of services ▪ Promote awareness of PPPs in the sector ▪ Train staff in the Ministry of Transport on PPP development, management and monitoring	Potential schemes to be identified/reviewed in NTMP Incentives may conflict with free market
To ensure the provision of safe, reliable, effective and efficient transport operations by private sector	▪ Review policies at negatively affect local entrepreneurs in the provision of transport services ▪ Take affirmative action to encourage participation of local entrepreneurs ▪ Provide tailor made trainings for local transport industry players	Requires citizens' empowerment legislation
To increase participation of local private sector in transport service provision	▪ Encourage/arrange the relevant training for the private sector players ▪ Lobby universities and colleges to develop courses relevant for private sector players	Should identify technical and financial capacity separately
To strengthen the capacity of the private sector	▪ Implement strategies identified in the national construction industry policy	Contracts let to foreign firms can have thresholds for domestic participation Foreign contractors should have capacity building clauses for Malawian firms Contracts to be let only to Malawian companies
To strengthen the capacity of the private construction sector	▪ Undertake scoping study of potential PPPs in the sector	Potential PPP's to be identified in NTMP
To ensure the provision of sustainable expansion of infrastructure by the private sector	▪ Engage MoF&ED in the budget preparation process to ensure that the macroeconomic environment is conducive for the growth of private sector ▪ Lobby banks and other financial institutions on ways for improving access to financing	Access to finance and high interest rates inhibit the growth of local contractors and transporters. Government-backed guarantee fund to be investigated

Good governance

Table A.6 shows road sub-sector related policy objectives identified for good governance, the key strategies and a brief commentary.

Table A.6 Good governance – polices and strategies

Policy objective	Key strategies	Remarks
To promote compliance with regulations	▪ Collaborate closely with Traffic Police ▪ Sensitise MoF&ED on the regulatory function of DRTSS and Traffic Police	Institutionalise joint working on vehicle and driver inspections, safety outcomes, and data sharing

Strengthening of institutional framework

Table A.7 shows road sub-sector related policy objectives identified for institutional strengthening, the key strategies and a brief commentary.

Table A.7 Institutional strengthening – polices and strategies

Policy objective	Key strategies	Remarks
To improve performance of sector institutions	▪ Regular monitoring of Policy Implementation Plan ▪ Strategic Plan in place and regularly monitored ▪ Hold annual Joint Transport Sector Review meetings ▪ Development and review of business plans for DRTSS, RFA, RA	Other agencies included in NTMP

Cross-cutting issues

Table A.8 shows road sub-sector related policy objectives identified for cross cutting issues, the key strategies and a brief commentary.

Table A.8 Cross-cutting issues – polices and strategies

Policy objective	Key strategies	Remarks
To increase sectoral commitment towards social and environmental management in the Transport sector	▪ Advocate for full provision in the Transport sub-sector policies and strategies for management of social and environmental issues ▪ Build institutional capacity in all Transport sub-sectors to adequately address social and environmental issues ▪ Introduce public education campaigns aimed at reducing vandalism of transport infrastructure	Ensure this is carried through to NTMP
To ensure that the sector is environmentally friendly	▪ Ensure that environmental Impact Assessment (EIA) mandatory for all development programmes and projects in the Transport sector ▪ Mainstream gender in Social and Environmental Impact Assessments (SEIA) for all transport sector projects and programmes ▪ Strengthen transport systems for all modes of transportation to ensure conformity to Environmental Laws ▪ Monitor all Transport sub-sector agencies and concessionaires to ensure that they identify environmental and social impacts and implement necessary management and mitigation actions. ▪ Align existing policy and regulatory frameworks with international protocols and agreements on transport sector crosscutting themes	
To increase Transport sectoral commitment towards mainstreaming of gender, HIV and AIDS and the plight of marginalised and vulnerable groups in all sectoral programmes and projects	▪ Promote use of gender analysis tools in the planning of transport infrastructure development and provision of transport services ▪ Promote the development of Gender, HIV and AIDS workplace policies among players in the transport sector ▪ Prevent gender-based violence, harassment and HIV in the Transport sector ▪ Promote adequate nutrition among staff members in the Transport sector ▪ Make mandatory the provision of equitable access to male and female members of communities surrounding project areas in HIV programmes	Gender to be taken account of in transport surveys for NTMP

Policy objective	Key strategies	Remarks
To improve transport infrastructure conditions in both the urban and rural areas	▪ Strengthen/enhance the institutional capacity of subsectors to adequately improve transport infrastructure conditions in the country ▪ Promote construction of transport infrastructures which are user friendly to all gender categories including the physically challenged people	To be reviewed in NTMP Universal Design Principles
To promote participation of women in institutional decision making processes	▪ Disseminate gender mainstreaming guidelines to all transport sector players and monitor implementation ▪ Strengthen institutional structures to ensure effective gender mainstreaming and coordination in the Transport sector ▪ Advocate for equal participation in decision making and access to opportunities in the transport sector regardless of gender	Promotion of women-owned companies in transporting and construction sector to be reviewed
To increase transport sectoral commitment towards Disaster Risk and Climate Change Management	▪ Advocate for disaster preparedness and contingency planning in all Transport sub- sectors ▪ Strengthen Transport sub-sectors capacity to effectively do contingency planning in preparedness for disasters	Climate change needs to be mainstreamed into NTMP
To promote transport infrastructure resilience to natural disasters	▪ Sensitise all transport stakeholders on disaster risks and mitigation measures in design and construction of various infrastructure. ▪ Build the capacity of construction industry players in developing appropriate designs and construction methodologies that take into account various disaster risks. ▪ Strengthen the transport sectoral monitoring capacity to effectively assess construction projects' compliance to relevant standards and regulations for disaster risks mitigation	

Appendix B: **Agriculture road construction, upgrade and maintenance needs**

B.1 Blantyre

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Lunzu TC to Mankhowe Road	Lunzu PTC to Mankhokwe Road	LUNZU Trading Centre starting from Lunzu PTC	5	Needs reshaping and 3 lines Culvert	Connecting the Hinterland social service Institutions (Schools , health facilities) to the Trading Centre
Lirangwe to Makomano School	Lirangwe Trading Centre	Namwali Siyo Village near Makomano School	10	Needs reshaping and constructing a Concrete Irish Bridge and some culverts	Strategic road for agriculture produce
Domwe to Ngongomwa Road	Muhura Market	Domwe Village	9	A double deck concrete bridge was washed away with 2015 floods and requires replacement	Market, agriculture area, health centre and schools
Chitungu to Domwe	Chitungu near Mkwate Market	Domwe T.C.	7	Needs 3 span bridge	Market, agriculture area, health centre and schools
Lunzu T.C to Chilaza	Chitimbe Shop	Chilala School	6	No camber , No check dams	Market , agriculture area,
Jubeki to Billy Village	Near Mdeka Village	Billy Village	8	Black cotton soil requiring gravelling, culvert structures broken	Market, agriculture area, health centre and schools
Chisi to Kholombodzo	Lundu Court	Billy Village	6	More culverts damaged	Irrigation farming
Mdeka to Mpanda	Mdeka T C	Mpanda School	6	No camber road, more broken culverts	Agriculture area, and schools
Fred II to Midule School	Fred II Village	Midule School	5	No camber road , more broken culverts	Irrigation schemes, schools
Makomano to Mhura	Makomano FP School	Muhura Mkt	8	Most drainage structures damaged	Market, agriculture area, health centre and schools
Chigumula to Chiradzulu Border	Chigumula Trading Centre	Chiradzulu border endpoint. Railway line crossing	7	The road has completely lost camber and has very big gulleys	Market, agriculture area, health centre and schools

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Ndogolo to Thyolo Boundary	Chiradzulu border via GVH Mtenje	Mang'omba U-5 Clinic and Primary School	8	Requires 20m Irish bridge and replacement of damaged culverts	Market, agriculture area, health centre and schools
Mpemba SDI to Nancholi	Mpemba SDI Junction	Nancholi Primary School	8	Has lost camber. Heavy scouring of side drains. Requires additional culverts. Very slippery during rainy season.	Market, agriculture area, health centre and schools
Tsoka to Chimembe	Tsoka Village	Chilingani Primary school Chimembe Health Centre	7	No camber, no side drains, No check dams. Requires 100metre concrete padding	Agriculture area, health centre and schools
Chileka PTC to Lemu	Chileka Trading Centre	-	7	Needs re-concreting irish bridge driveway no camber, no side drains, no check dams. Slippery during rainy season	Dapp ttc, agriculture area, irrigation scheme and schools
Chimembe to Likhubula Bridge via Namitala	Chimembe Health Centre	Namitalala J.P. School	11	No camber, no side drains, no check dams, requires small drifts, splashes.	Market, agriculture area, health centre and schools
Chumachiyenda to Makanjira	Andiseni Trading Centre	Makanjira Village, Makanjira Primary School		No camber, no side drains, no check dams, slippery in rainy season, need 300m concrete padding.	Market, agriculture area, health centre and schools

B.2 Balaka

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Type of surface	Current condition of road	Strategic importance of road to the district
S133 Balaka - Ulongwe	Balaka	Ulongwe Trading Centre	30	Earth	Fair	Agricultural areas, markets, health centres and schools
T387 Chembera-Kapire	Chembera Trading Centre	Kapire Trading Centre	17	Earth	Fair	Agricultural areas, markets, health centres and schools
T399A Chendausiku - Utale 2	Chendausiku Trading Centre	Utale 2 Community Day Sec School & Health Centre	20	Earth	Fair	Agricultural areas, markets, health centres and schools
T399B Utale 1 - Phalula	Utale 1 Trading Centre	Phalula Trading Centre	32	Earth	Bad	Agricultural areas, markets, health centres and schools
T400 Balaka – Shire North Via Phimbi	Balaka Boma	Shire North	50	Earth	Bad	Agricultural areas, markets, health centres and schools
S74 Balaka Town Loop Road	Ngwana Filling Station	Chembekezo Motel	2	Bitumen	Bad	Agricultural areas, markets, health centres and schools
M8 Liwonde – Chingeni	Liwonde Township	Chingeni Road Block	30	Bitumen	Fair	Agricultural areas, markets, health centres and schools
D251 Ulongwe to Chisongwe	Ulongwe Court	Chisongwe School	12	Earth	Fair	Agricultural areas, markets, health centres and schools
D268 Ulongwe - Mvera	Ulongwe Trading Centre	Liwonde National Park	17	Earth	Bad	Agricultural areas, markets, health centres and schools
D269 Likangwa to Mvuu Camp	Ulongwe Mission School & Health Centre	Mvuu Cam (Liwonde National Park)	9	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Nzengeza -Mwima	Nzengeza Trading Centre	Mwima Trading Centre	26	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Mwima - Namanolo	Mwimwa Trading Centre	Namanolo Health Centre, School and Chilanga School	15	Earth	Bad	Agricultural areas, markets, health centres and schools

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Type of surface	Current condition of road	Strategic importance of road to the district
UD Mangochi Turn Off – Utale 2	Mangochi Turn off	Utale 2 Schools & Health Centre	20	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Mbaza - Mululu	Mbaza	Mululu Railway Station	18	Earth	Bad	Agricultural areas, markets, health centres and schools
Rivirivi School to Senzani	Rivirivi School	Senzani Trading Centre	17	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Kapalamu - Chitseko	Kapalamula	Chitseko	5	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Kaliyati - Kuntiyani	Kaliyati Trading Centre	Kuntiyani	10	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Tambala - Nkaya	Tambala	Nkaya	16	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Disi - Kwitanda	Disi	Kwitanda	7	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Mponda - Khwisa	Balaka Boma	Khwisa	11	Earth	Very Bad	Agricultural areas, markets, health centres and schools
UD Chikombola – Fulano via Sawali	Chikombola	Fulano	10	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Jimu – Kapire via Misu	Jimu	Kapire	20	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Dziwe - Mawira	Dziwe trading Centre	Mawira School	10	Earth	Very Bad	Agricultural areas, markets, health centres and schools
UD Kachenga – Nkasi via Nambira	Kachenga Trading Centre	Nkasi School	15	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Kuntiyani - Nambira	Kuntiyani	Nambira school	6	Earth	Fair	Agricultural areas, markets, health centres and schools

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Type of surface	Current condition of road	Strategic importance of road to the district
UD Kankao to Manjawira via Mfulanjobvu	Kankao Trading Centre	Manjawira Trading Centre	15	Earth	Fair	Agricultural areas, markets, health centres and schools
UD Disi - Magomero	Naliswe School	Magomero Trading Centre	10	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Kwitanda -Dziwe	Kwitanda Trading Centre	Dziwe Trading Centre	7	Earth	Bad	Agricultural areas, markets, health centres and schools
UD Naliswe – Njale	Naliswe school	Njale Trading Centre	6	Earth	Bad	Agricultural areas, markets, health centres and schools
Mbera Tower – Magombo CBCC	Mbera Tower	Magombo CBCC	20	Earth	Bad	Agricultural areas, markets, health centres and schools
UD M1 – Tsite	M1 Just after Phalula	Tsite	8	Earth	Fair	Agricultural areas, markets, health centres and schools

B.3 Chitipa

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Chilinda Turn Off - Nkhanga, Tanzania boarder, M09	Nyika National Park	Tanzania	115	Very bad, drainage not available	Transportation of agricultural products
Mwamkumbwa - Kapenda,	Mwamkumbwa	Kapenda Health Centre	10	Muddy during rainy season and impassable	Transporting patients and agricultural products
Kapirinkhonde - Rukuru, S101	Kapirinkhonde	Mibanga	32	Very, needs to rehabilitate irish birdges, need to install washed away bridge at Navipalakata stream	Transportation of farm produce. Access to health centres, schools
Kalenge Bridge - Mwandambo Via Sokola, S100	Kapoka	Ngerenge, Karonga	32	Very bad, no drainage, culverts damaged	Transport farm products like coffee. Access to schools, health centres
Kameme - Ipula, Zambia boarder, T300	Kameme Centre	Zambia boarder	14. 5	Very bad, culvert, Irish bridges damaged	Transportation of farm products
Chisenga - Kabanje and Kakasu. S104	Chisenga	Zambia boarder	17	Very bad, drainage not available	Access to schools and health centres, transport farm products.
Ibuzga - Chipitu	Ibuzga	Chiwanga	28	Very bad, drainage not available	Access to schools, transport farm products
Lufita - Ifumbo - Upighu	Lufita	Upighu	28	Very slippery during rainy season, damaged culverts and irish bridges	Access to schools and health services. Transport farm produce
Udonda - Mwamkumbwa, D2	Kameme	Mwamkumbwa	12. 8	Slippery during rainy season	Access to schools. transport farm products
Nthalire - Chinthi, T331	Nthalire TC	Chinthi, Zambia boarder	11	Fair condition, damaged timber deck bridge and irish bridge	Access to schools and transportation of farm produce

B.4 Karonga

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Karonga -Chitipa	Karonga	Chitipa	86	Fairly good- poor quality final layer Final levels very compromised	Facilitates movement of agricultural produce from between Chitipa and Karonga
Mpata- Mahowe Ntharile road	Mpata- Karonga	Chitipa- Nthalire	35	Very bad- bridges were done but no backfill	Connects agriculture zone of Nthalire
Wovwe – Chihepusha rice scheme road	M1- Wovwe	Chihepusha rice scheme	18	Not gaveled part of it The bridge washed a way	Agricultural area
Ighembe Kakolya Road	Ighembe	Kakolya	25	Very bad – require gravel and bridges	Agricultural Area
Songweborder to Ngana Road	Songwe border	Ngana	36	Require culverts and expansion plus gravelling	Agricultural area, Health and education institutions
Katili Road	Katili turnoff	Kazguli -Nthalire	55	Require upgrading to gravel condition	Agricultural Area

B.5 Machinga

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Mbonechera T/Off - Masanje	Namandanje	Mangamba	19	Half of road graded	Provides access to farm produce
Nselema - Malundani	Nselema T.c	Nyambi	11	Good	Provides access to farm produce
Nantwe - Nkwepele	Chisise	Nkwepele T.c	20	Good	Provides access to farm produce
Ntaja - Chikweo Via Mpiri	Kawinga	Chikweo	30	Good	Provides access to farm produce
Chikweo - Lake Chiuta	Chikweo	Njerwa	24	Rutting and sectional damages	Fishing area
Chikweo - Nanyumbu	Chikweo	Kawinga	24	Good	Agricultural area
Nsanama - Nayuchi	Lambulira	Nchunguza	54	Rutting and sectional damages	Agricultural area
Chingale T/Off - Chinkwezule	Bisa	Mdele	9	Good	Agricultural area
Namwela T/Off - Naminga	Ndecha	Mlomba	34	Good	Agricultural area
Nanyumbu - Mbanira	Kawinga	Mbanira	19	Rutting and sectional damages	Agricultural area
Umbwa - T390 Junc.	Umbwa	Majiga	6	Good	Agricultural area
Mpiri - Nselema	Lokho	Nainunje	11.8	Gullies on side drains and potholes developed	Agricultural area
Nampeya - Mwenye			9.3	Rutting and sectional damages	Agricultural area
T391 Junc. (Mijombo) - Nlaluwe	Mijombo	Adamson	9.1	Rutting and sectional damages	Agricultural area
Mlomba - Puteya via Mposa	Mlomba	Puteya	27.8	Good	Agricultural area
Puteya - Chamatwa	Puteya	Msumbo	14.9	Good	Agricultural area
Majiga - Mpheta	Chamba	Mpheta Irrigation Scheme	7.3	Rutting and sectional damages	Agricultural area
Mpilisi - Lisanjala	Naungu	Makaluka	26	Rutting and sectional damages	Agricultural area

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Mpotola - Kwirasha	Mpotola T.c	Kwirasha	9.1	Rutting and sectional damages	Agricultural area
Umbwa - Nainunje	Umbwa T.c	Nainunje	19	Rutting and sectional damages	Agricultural area
Fakili - Mpango	Nkalo	Mpango	11	Gullies on side drains and potholes developed	Agricultural area
Misikizi - Masi	Nsosa	Makaluka	9	Rutting and sectional damages	Agricultural area
Ndecha - Chamatwa	Ndecha	Msumbo	7	Rutting and sectional damages	Agricultural area
Mlenje - Nthiniwa	Chikojo	Nthiniwa	26	Rutting and sectional damages	Agricultural area
Namandanje - Mjahito	M'mwala	Njahito	7.5	Rutting and sectional damages	Agricultural area
Nyenje - Ngongondo	Nyenje	Ngongondo	10	Gullies on side drains and potholes developed	Agricultural area
Mkwepele - Mwitiya	Nkwepele T.c	Kayuni	21	Rutting and sectional damages	Agricultural area
Nkwate - Malundani	Nkwate	Nyambi Hq	13.5	Gullies on side drains and potholes developed	Agricultural area
Mpata - Gawanani	Wilisoni	Nsosa	14	Gullies on side drains and potholes developed	Agricultural area
Mjoho - Nkhumbwa	Joho T.c	Nkhumbwa	10	Rutting and gullies on side drains	Agricultural area
Dinji - Kondoni	Chikweo	Dinji	24	Silted sidedrains	Agricultural area
Mwase - Chimwankhwazi	Mwase	Chimwankhwazi	11	1 IB washed away	Agricultural area
Mpilisi - Chindungwa	Nliwo	Mpingo	9.5	Gullies on side drains and potholes developed	Agricultural area
Mapuloti - Naungu	Kalonjere	Naungu	7.1	rutting and gullies on side drains, 2 Ibs washed away	Agricultural area

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Molipa - Chisuwi	Molipa T/ Centre	Chisuwi	12	Rutting and sectional damages, 7m long bridge required	Agricultural area
Chisuwi - Mwambala	Chisuwi	Mwambala	15.5	Rutting and sectional damage	Agricultural area
Mwambala - Masanje	Mwambala	Mangamba	15	Rutting and sectional damage	Agricultural area
Mbonechera - Mbweso	Ta Liwonde	Mbweso	12.5	Rutting and sectional damage	Agricultural area
Mlomba - Masinde Dip Tank	Machinga	Masinde	9.5	Rutting and sectional damage	Agricultural area
Mangamba - Chikuluma	Mangamba	Chikuluma	16	Rutting and sectional damage	Agricultural area
Tcholo - Ntemankhalamba	Tcholo	Ntemankhalamba	10	Rutting and sectional damage	Agricultural area
Perasha - Ntambo	Perasha	Ntambo	9	Rutting and sectional damage	Agricultural area
Gowero - Namazengeza	Gowero	Namazengeza	17	Rutting and sectional damage	Agricultural area
Nkasaulo - Kamwendo	Chinthenga	Kamwendo	9	Rutting and sectional damage	Agricultural area
Mombe - Ntubwi	Mombe	Nliwo	8	Rutting and sectional damage	Agricultural area
M'mwala - Nangondo	Namandanje	Nangondo	12	Rutting and sectional damage	Agricultural area
Nyanyika - Chipakwe	Nkoola	Chipakwe	10	Rutting and sectional damage	Agricultural area
Nkomankhani - Mchiji	Nkomankhani	Mchiji	9.2	Rutting and sectional damage	Agricultural area
Admarc - Nyama	Kalonjere	Nyama	8	Rutting and sectional damage	Agricultural area
Mitawa School - Ngokwe	Mitawa	Ngokwe	30	Rutting and sectional damage	Agricultural area

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Lutenje - Maweha	Lutenje	Maweha	7.7	Rutting and sectional damage	Agricultural area
Laluwele - Thundu	Mlaluwere	Adamson	6.3	Rutting and sectional damage	Agricultural area
Kalidoso - Nsinja	Kalidoso	Khuzumba	5	Rutting and sectional damage	Agricultural area
Masambuka - Kalambo	Masambuka	Kalambo	9.5	Rutting and sectional damage	Agricultural area
Ntaja - Masambuka	Ntaja T/Centre	Masambuka	7	Rutting and sectional damage	Agricultural area
Chamatwa - Likwenu	Chamatwa	Mpango	3	Rutting and sectional damage	Agricultural area
Mowere - Chikojo	Mowere	Chikojo	7.4	Rutting and sectional damage	Agricultural area
Mambo - Mikwanda	Ntila	Tambula	3.9	Rutting and sectional damage	Agricultural area
Lipongo - Mpango	Machinga Boma	Mpango	7	Rutting and sectional damage	Agricultural area
Mbalame - Chipole	Mposa T/ Centre	Chipole	5.7	Rutting and sectional damage	Agricultural area
Zumulu - Mbawe	Zumulu	Mbawe	5.7	Rutting and sectional damage	Agricultural area
Mayera - Nachaje	Mayera	Nachaje	2.2	Rutting and sectional damage	Agricultural area
Malundani - M'bwabwa	Malundani	M'bwabwa	9	Rutting and sectional damage	Agricultural area
Sawanje - Maliro	Swawnje	Maliro	9	Rutting and sectional damage	Agricultural area
Ngokwe School - Chitundu Sch	Ngokwe T/ Centre	M'mwala	4.4	Rutting and sectional damage	Agricultural area
Chimwaza - Nangondo	Chimwaza	Nangondo	5.2	Rutting and sectional damage	Agricultural area
Chibwana - Nsanama	Chibwana	Nsanama Scheme	5.2	Rutting and sectional damage	Agricultural area

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Nkool - Phwiti	Nkoola	Phwiti	7.4	Rutting and sectional damage	Agricultural area
Nkoola - Nampeya	Nkoola	Nampeya	6	Rutting and sectional damage	Agricultural area
Nchedweka - Mpiri	Nchedweka	Mpiri	3	Rutting and sectional damage	Agricultural area
Makogolo - Mayera	Makogolo	Mayera	2.2	Rutting and sectional damage	Agricultural area
Nampeya - Limera	Nampeya	Limera	4	Rutting and sectional damage	Agricultural area
Nayuchi - Misi	Nayuchi	Misi	5.2	Rutting and sectional damage	Agricultural area
Mwitiya - Chimbira	Mwitiya	Chimbira	6	Rutting and sectional damage	Agricultural area
Mgodi - Mapata	Mgodi	Mapata	5	Rutting and sectional damage	Agricultural area
Namwini - Ntaja Chipanga	Namwini	Ntaja	6.2	Rutting and sectional damage	Agricultural area
Bakali - Khama Estate	Bakali	Khama Estate	6.5	Rutting and sectional damage	Agricultural area
Nainunje - Mkhweya	Nainunje	Nkhweya	5.7	Rutting and sectional damage	Agricultural area
Kwirasha - Chiganda	Kwirasha	Chiganda	5	Rutting and sectional damage	Agricultural area
Mbonechera - Mitusi	Mbonechera	Mitusi	5.2	Rutting and sectional damage	Agricultural area
Muhatere - Chidothi	Muhatere	Chidothi	7.2	Rutting and sectional damage	Agricultural area
Mpumbe - Sowani	Mpume	Sowani	5.1	Rutting and sectional damage	Agricultural area
Makwemba - Mijombo	Makwemba	Mijombo	4.8	Rutting and sectional damage	Agricultural area
Namwera - Nsoma	Namwera	Nsoma	5.3	Rutting and sectional damage	Agricultural area
Kamandani - Macherera	Kamandani	Macherera	6.1	Rutting and sectional damage	Agricultural area

B.6 Mangochi

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
T389	Masuku	Ipani	17.7	Poor	Agriculture
S129	Mangochi	Makanjiraz	97	Fair	Fishing
T382	Chantulo	Sosola	19.5	Poor	Agriculture/ Fishing
D270	Majiga	Chiunda	6.8	Fair	Agriculture
D262	D621 junction	Mbele	3.1	Poor	Agriculture
UDY	T387 junction	Mponda	7.6	Poor	Agriculture
T387	Namwera	Katuli	45	Fair	Agriculture
T386	Idruss	Kwisimba	48	Fair	Agriculture
T379	Sumbi	Malembo	23	Poor	Fishing
UD	Kela	Mawiliga	34	Fair	Agriculture
UDX	Brahim	Ngapani	20.5	Poor	Agriculture/ Fishing
T385	Mangochi Boma	Chilipa	66.4	Poor	Agriculture
T377	Makanjira	Chipole	43	Poor	Fishing
T388	Mbalula	Masanje	63	Poor	Agriculture + A2A1:F19

B.7 Mzimba

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Sokopo – Mnyanjagha Bota (T311) &	Mpherembe	Manoro	30	Earth, very poor	Tobacco Estates, Green Vegetables & farm produce in TA Mpherembe, Boarder to Zambia
Kamwe - Vongo	Kamwe	Rumphi Boma	15	Earth, poor – requires a bridge across Rukuru river to Rumphi.	Access to Rumphi Hospital, Tobacco Estates
Lake Kazuni – Ekwendeni (T309)	Ekwendeni	Kazuni	50	Earth, poor – needs a bridge	Access of Ekwendeni Hospital, Tobacco Estates, Tourism at Lake Kazuni
Chanyama – Mnyanjagha Bota (S105)	Chanyama	Manoro	64	Earth, very poor	Tobacco Estates at Mbalachanda, Produce Markets at Mbalachanda and Madede
Chimaliro forest – Kanjuchi via Mabulabo (T326 & D71) to Mgoza	Chimaliro forest	Mgoza School	64	Earth, very poor, Bridge with collapsed pier at Misusu River Kanjuch – Mgoza Section is inaccessible.	Kanjucchi CDSS, Mkoma Health Centre, Emfeni CDSS, Emfeni Health Centre & Mgoza Agriculture area.
Phazi - Kasangazi	Chamaji	Chizani	55	Earth, very poor	Irrigation scheme called Rupasha that supplies vegetables, and green maize
Chizani - Kapita	Chizani	Kapita	45	Earth, bad	Supply route of beans and green maize (Irrigation) to Jenda Trading centre

B.8 Nkhotakota

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Mkaika -Mwansambo	Mkaika	Mwansambo	30	Weather(gravel)	Transportation of agriculture produce from Mwansambo to M5 road e.g Ground nuts
Rajab - Kayoyo	Rajab (kalimanjira)	Mpamantha, Mtaya, Likowa, Kayoyo	41	Weather(partly gravel)	Transportation of agriculture produce from Mpamantha and Likowa to M5 roade.g Rice, Ground nuts
M1 (M5) Main road	Dwangwa	Salima (kaphatenga)	169	Tarmac but very narrow with heavy portholes	Transportation of agriculture produce from Nkhotakota to Salima e.g Ground nuts, Sugarcane and Rice etc
Nkhunga -Mchilazi	Nkhunga	Mchilazi	20	Weather (no gravel)	Transportation of agriculture produce from Mchilazi to M5 roade (Nkhunga).g Sugarcane
Msenjere -Chizeo	Msenjere	Katimbila,Jeja	32	Weather (no gravel)	Transportation of agriculture produce from jeja,Katimbila to M5 road e.g Rice and Sugarcane
Chulingali	Bauti	Chanika	11	Weather (no gravel)	Transportation of agriculture produce from Mwansambo to M5 road e.g Ground nuts
Kasitu-Lupachi	Kasitu	Lupachi	69	Weather (no gravel)	Transportation of agriculture produce from Lupachi to M5 road.
Dwambazi	Dwambazi	Kaluweya	12	Weather (partly gravel)	Transportation of agriculture produce from various irrigation schemes to M5 road.
Mtachi	Mtachi	Natiyi	10	Weather (no gravel)	Transportation of agriculture produce from various irrigation schemes to M5 road.

B.9 Rumphi

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Rumphi Boma – Chitanga (M24)	Matunkha Centre	Chitanga	38	Poor	Serves agricultural areas of Bolero &Mwazisi EPAs. Used as route to Nyika National park (tourism)
Bowe - Chilinda T/Off (M9)	Bowe Trading Centre	Chitanga	23	Poor	Serves agricultural areas of Bolero &Mwazisi EPAs. Used as route to Nyika National park (tourism)
Chiweta – Mlowe (M11)	Chiweta Trading Centre	Mlowe CDSS	11	Fair	Serves fishing areas of Mlowe, Zunga and Tcharo.
Chikwawa – Bowe (S9)	Chikwawa Trading Centre	Bowe	20	Poor	Serves agricultural areas of Bolero &Mwazisi EPAs. Used as route to Vwaza Game Reserve and Lake Kazuni (tourism)
Thumbi – Uzumala(T307)	Thumbi	Uzumala Trading Centre	33	Poor	Serves agricultural areas of Mphompha and Uzumala where Irish potatoes, beans, maize, coffee, Apples and Macademia are grown
Mphompha-Jinthajembe (T319)	Mphompha Trading Centre	Jinthajembe	10.1	Poor	Serves agricultural areas of Jinthajembe and Mphompha
Mlowe - Zunga	Mlowe CDSS	Zunga	12.4	Poor, requires drainage structures	Serves fishing areas of Mlowe, Zunga and Tcharo.
Phwezi – Uzumala	Phwezi Boys Secondary School	Uzumala	10	Poor, requires drainage structures	Serves agricultural areas of Uzumala, Usowoya, Katunga and Ntchuka
Phoka – Chakaka	Phoka Court	Chakaka	12	Poor	Serves agricultural areas of Phoka and Chakaka where coffee, bananas and honey are produced.

Name of road	Name of area that the road comes from	Name of area the road goes to	Road length (kms)	Current condition of road	Strategic importance of road to the district
Kawaza - Jumbi	Kawaza Trading Centre	Jumbi FP School	12	Poor	Serves agricultural areas of Jumbi, Lundu and Kawaza where tobacco, maize are grown. Also provides access to the water intake for the Nkhamanga Water Scheme
Rumphi Boma - Bondi	Rumphi Boma	Bondi	13	Poor	Serves agricultural areas of Bondi and Jalako.

Appendix C: **Forecast population and economic growth**

C.1 Current population and forecast growth

C.1.1 Base line population

In the 2008 National Statistics Office (NSO) census, the population of Malawi was measured to be 13,007,160. In the 42-year period from 1966 to 2008 the population grew at an average of 3% per year as follows:

Table C.1 Inter-census population growth rates

Year of census	Population	Average international growth rate (%)
1966	4,039,583	3.3
1977	5,547,460	2.9
1987	7,988,507	3.7
1998	9,933,868	2.0
2008	13,077,160	2.8

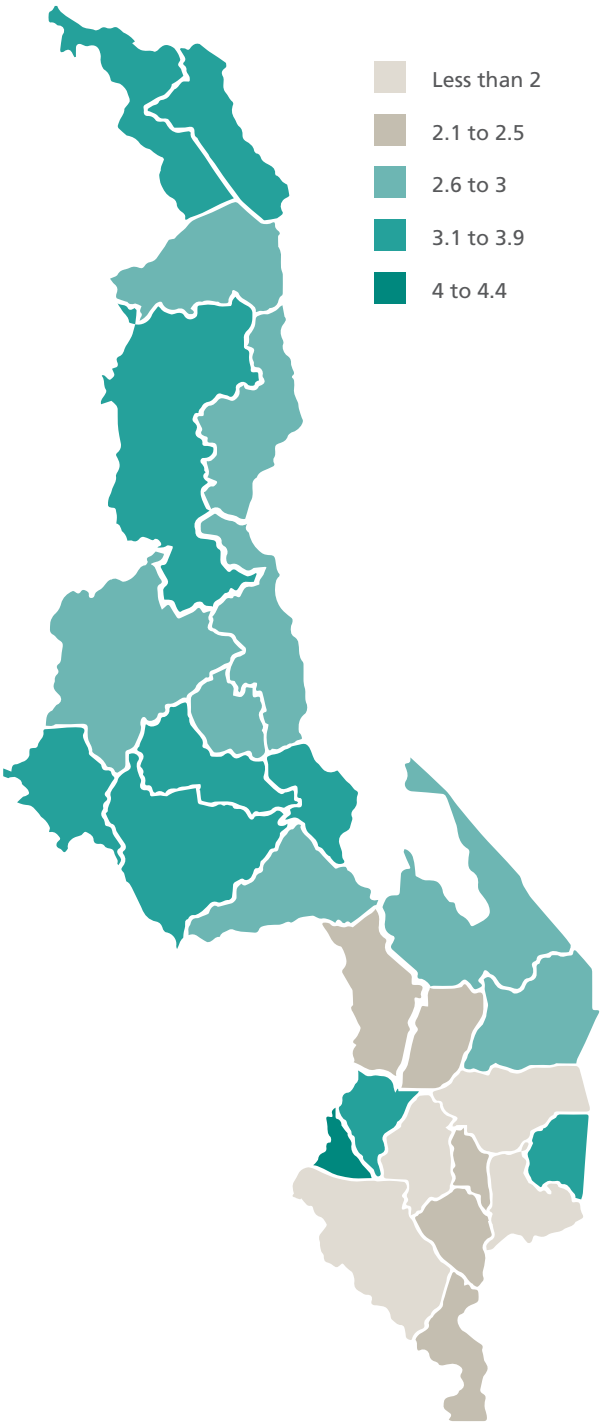
C.1.2 Population forecasts

Population projections prepared by NSO up to the year 2030 are presented in Table C.2. The country's population is expected to double in the 20-year period 2016 to 2036. The population is growing faster in the northern and central districts. Growth is slower in the districts of the more densely populated southern region as shown in Figure C.1.

Table C.2 Population projections for Malawi

Year	Population
2016	16,832,910
2021	19,718,415
2026	23,067,018
2031	26,895,288
2036	31,191,010

Figure C.1 Forecast annual population growth (%) by district, 2016 to 2036

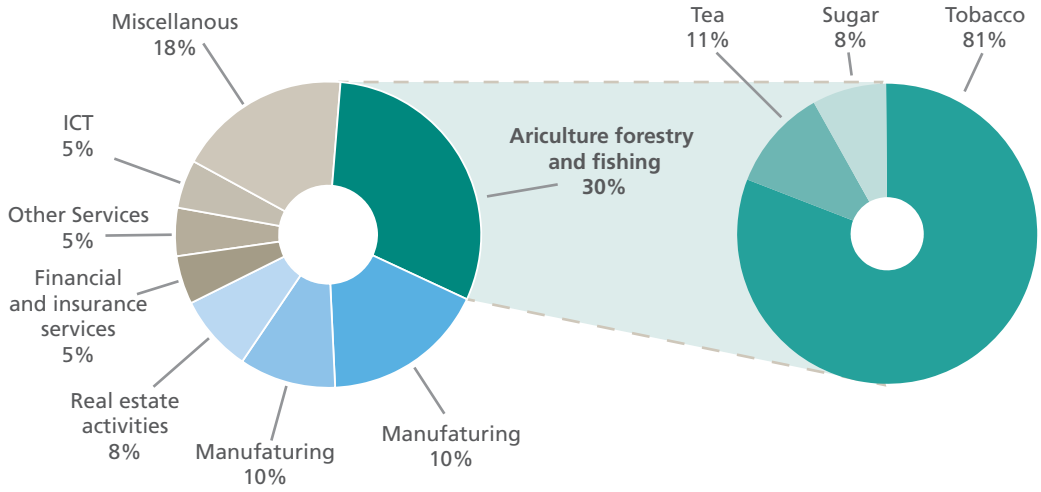


C.2 Economic performance and forecast growth

C.2.1 Overall

Malawi is highly dependent on agriculture exports for revenue. Growth in trade flows is expected to be subdued over the medium term due to the slump in commodities prices and slack demand for Malawi's major export, tobacco.

Figure C.2 Contribution to GDP by sector and breakdown of exports, 2016



Source: National Statistical Office (NSO) and Department of Economic Planning and Development (DEPD).

C.2.2 Sectoral economic performance

Sectoral growth is shown in Table C.2. Sectors that have experienced the highest growth rates recently are wholesale and retail trade, accommodation and food services (tourism), and information and communications.

In 2015, the agricultural sector contracted by 1.6 percent. The reduction is on account of the adverse weather conditions such as the late onset of rains, the January 2015 floods, the uneven distribution of rainfall and dry spells which negatively affected the sector. Crop production declined by the following rates; maize decreased by 30 percent, rice by 18 percent and cassava by 2 percent. The overall decline was not as pronounced as originally estimated due to an increase in tobacco production.

Table C.3 Annual sectoral growth (%), 2013 to 2017, and sectoral contribution to GDP

Sector	2013	2014	2015	2016*	2017*	2017 Contribution to GDP
Agriculture, forestry and fishing	6.2	6.3	-1.6	3.2	6.9	28.0
Mining and quarrying	6.9	-4.6	1.1	0.4	1.6	0.8
Manufacturing	5.6	6.3	3.8	3.4	5.4	9.3
Electricity, gas and water supply	5.5	3.0	2.3	2.7	4.0	1.2
Construction	2.0	4.8	3.4	2.1	3.5	2.6
Wholesale and retail trade	7.9	6.3	4.7	5.6	7.9	16.2
Transportation and storage	5.3	4.8	4.6	6.6	4.6	2.7
Accommodation and food services	5.1	5.9	5.6	6.2	6.5	2.0
Information and communication	7.5	12.2	8.5	5.4	6.4	4.3
Financial and insurance services	3.8	5.5	6.9	4.7	6.8	5.1
Real estate activities	2.5	3.7	1.6	3.1	2.9	7.3
Professional and support services	5.5	7.4	4.6	7.7	3.0	0.3
Public administration and defence	2.7	5.1	6.3	6.1	6.2	2.0
Education	5.4	4.0	5.9	7.4	6.7	2.6
Health and social work activities	5.1	4.2	3.5	7.6	6.7	2.7
Other Services	5.5	5.4	5.9	5.5	4.3	4.8
GDP at constant market prices	**6.3**	**6.2**	**3.1**	**5.1**	**7.0**	28.0
GDP at current prices	**23.8**	**31.5**	**26.5**	**21.5**	**23.6**	0.8

Within the **Agriculture** sector, tobacco production increased from 192 million kilograms in 2014 to 193 million kilograms in 2015. In 2016 the sector is projected to grow by 3.2 percent despite the adverse effects of El Nino weather conditions which resulted in erratic rainfall patterns and dry spells across the country. According to first round crop estimates, the moderate growth in the sector is being driven by commercial farming. In particular, tobacco production increased by 10 percent and sugarcane production grew by 2.8 percent.

The export value of edible nuts between 2014 and 2015 grew by 52.3 percent. This makes it the third largest export of Malawi, following tobacco and sugar. Even though the production of groundnuts and cashews decreased in 2015 due to unfavourable weather conditions, it appears that production of macadamia nuts increased significantly, particularly in the Northern region. Macadamia nuts are high-value nuts in international markets and can fetch up to US$12 dollars per kilogram.

In 2017, the sector is projected to rebound with growth of 6.9 percent on the assumption that the weather condition will normalise.

In 2015, the **Mining and Quarrying** sector is expected to grow quite modestly by 1.1%, compared to a negative growth of 4.6% registered in 2014. Growth in the sector will be driven by the production of minerals and coal. Growth was lower than expected in 2015, due to delays in the commencement of production of Kanyika Niobium Mine by Globe Metals and Mining in Mzimba. Modest growth will continue in 2016 and the sector is expected to grow by 0.4 percent and 1.6 percent in 2017 respectively. The resumption in production of uranium at the Kayelekera Uranium Mine is not expected to take place in the course of 2016 and 2017 as international uranium prices remain low.

The **transport and storage services sector** is estimated to grow by 4.6 percent in 2015 compared to 4.8 percent registered in 2014. While fuel prices generally reduced, damage to road and rail infrastructure sustained during the floods presented a challenge to the sector. On the other hand, the import of maize from Zambia has benefitted the sector. In 2016 the sector is projected to grow by 6.6 percent largely due to growth in the wholesale and retail trade sector and the modern depots that are to be built in Mzuzu and Lilongwe.

In 2017 the sector is projected to slow down to 4.6 percent. This is mainly attributable to the anticipated increase in international fuel prices in the year.

The **accommodation and food services sector** grew by 5.6 percent in 2015. In 2015, the Government supported the marketing of the tourist sector through a number of activities, including designating September 2015 as Malawi Tourism Month. Despite these positive developments, the introduction of a tourist visa fee in October 2015 has negatively affect international arrivals to the country. Growth is expected to remain strong in 2016 and 2017 at 6.2 and 6.5 percent.

C.2.3 Economic growth projections

C.2.4. National projections

National GDP growth projections for Malawi are shown in Table C.4.

Table C.4 GDP growth projections

Source	2015	2016	2017	2018
Economic Intelligence Unit	3.1	2.7	3.8	5.0
International Monetary Fund	2.9	3.0	4.0	5.5
World Bank	2.8	5.0	5.8	5.8
Government of Malawi	3.1	5.1	7.0	-
Average	3.0	4.0	5.2	5.4

For the initial purposes of this study we have taken the following GDP growth estimates:

Table C.5 GDP growth estimates

Year	GDP growth
2015	3.1%
2016	5.1%
2017	7.0%
2018	5.8%

Projections beyond 2018 have been using sectoral assumptions as outlined on the next page.

C.2.5 Economic growth assumptions by sector

Table C.6 Assumptions on sectoral growth

Sector	Assumption
Agriculture	Reasonably strong growth in first ten years reflecting a move towards more valuable export crops, with lower growth rates in the second ten years as a result of lack of significant growth in world-wide demand for tobacco-
Electricity, Gas and Water	Large growth in the electricity sector starting in 2019 reflecting investment in new hydro power schemes needed to cut the power deficit and required to service mining and manufacturing sectors.
Mining and Quarrying	Massive growth in the period 2019 to 2023 reflecting the availability of power and up-turn in world-wide demand for minerals. This to be followed by lower but sustained growth.
Manufacturing	Slightly increased and sustained growth reflecting the growth in the primary sectors.
Construction	Slightly increased and sustained growth reflecting the growth in the primary sectors.
Wholesale and Retail Trade	Significant growth over the period 2021 to 2027 following growth in primary sectors.
Transport and Storage	Sustained growth at current levels.
Accommodation and food	Increased and sustained growth reflecting growth in tourism.
Information and Communication	Significant growth to 2021 reflecting improvements in IT needs, followed by lower but sustained growth.
Financial and Insurance	Continued growth at current relatively high levels to 2025, followed by slightly lower growth.
Real Estate	Average but sustained growth.
Professional and support services	Average but sustained growth.
Public Administration and Defence	Average but sustained growth.
Education	Average but sustained growth.
Health and social work activities	Average but sustained growth.
Other Services	Average but sustained growth.

Assumptions regarding the composition of the economy in 2017, average growth over the next two decades, and resultant composition in 2036 are shown in Table C.8.

Table C.7 lists the 5 year average growth assumptions for the period 2016 to 2036. The highest rate of growth in the economy is expected in the period 2021 to 2026.

Table C.7 Five year growth assumptions

Period	Average annual GDP growth (%)
2016-2021	6.5
2021-2026	6.7
2026-2031	5.2
2031-2036	5.1

Table C.8 Economic growth assumptions by sector

Sector	% of GDP in 2017	Average annual growth (%) 2017 - 2036	% of GDP in 2036
Agriculture	28.0	5.2	26.5
Electricity, Gas and Water	1.2	11.4	3.5
Mining and Quarrying	0.8	17.6	6.2
Manufacturing	9.3	6.0	10.3
Construction	2.6	4.7	2.3
Wholesale and Retail Trade	16.2	6.7	20.1
Transport and Storage	2.7	4.5	2.2
Accommodation and food	2.0	7.9	3.1
Information and Communication	4.3	5.8	4.5
Financial and Insurance	5.1	5.8	5.4
Real Estate	7.3	2.5	4.2
Professional and support services	0.3	3.0	0.2
Public Administration and Defence	2.0	6.0	2.2
Education	2.6	5.2	2.5
Health and social work activities	2.7	5.2	2.5
Other Services	4.8	4.0	3.7

C.2.6 **Agricultural sector growth**

In the agriculture sector over the next 20 years, reasonably strong growth is expected in first ten years reflecting a move towards more valuable export crops, with lower growth rates in the second ten years as a result of lack of significant growth in world-wide demand for tobacco.

By 2036, agriculture will still be the dominant sector in the economy, with a slightly reduced importance. It is expected that mining will increase its role significantly to contribute to just over 6% of GDP. Accommodation and food will increase its share by over 50%, but remain a relatively small contributor.

Increasing food security is one of the main objectives of Malawi's Agricultural Sector Wide Approach (ASWAp 2010) and a strong focus on increasing maize production since the mid-2000 has resulted in rapidly increasing production. However, production risks continue to result in high losses to the sector, including for maize. Further, price interventions in the sector over the past year have implied greater price risks for producers and traders.

While maize has been the major food crop in terms of the policy agenda and hectarage planted, tobacco has been, and continues to be, the dominant cash crop in the economy accounting for approximately 63 percent of the country's total export earnings. Tea and sugar are other important cash crops accounting for 8 percent and 7 percent of export earnings, respectively. Livestock production, which contributes about one-fifth of the value of total agricultural production, consists mainly of subsistence grazing of sheep, cattle, goats, poultry and pigs (WTO, 2002).

The most recent agricultural production data is available from the 2016 APES. Data for sugar are taken from the major producers. Production figures for the main crops are listed in Table C.9.

C.2.6.1 Crop yields

The agricultural sector is drought-prone and experienced severe droughts in 1979–81, 1992, 1994 and 2012. About 77% of the total land area of Malawi is under customary tenure, i.e.: subject to land allocation by village headmen based on traditional rights of succession by descent. Estate farming occupies about 23% of the cultivated land and provides about 90% of export earnings. In all, about 21% of Malawi's total land area is arable. Malawi is self-sufficient in food production (except during droughts), but the population increased more rapidly than the food supply in the 1980s.

While maize has been the major food crop in terms of the policy agenda and hectarage planted, tobacco has been, and continues to be, the dominant cash crop in the economy accounting for approximately 63 percent of the country's total export earnings. Tea and sugar are other important cash crops accounting for 8 percent and 7 percent of export earnings, respectively (WTO, 2002).

Cereal yields, fruit yields, oil crop yields, and tuber/roots yields have been growing at 2%, 2%, 0%, and 1%, respectively as depicted in Figure 14.4. Tuber/roots and fruit yields experienced a sharp increase in the late 1990's. Cereal yields had drop in the mid-2000 but quickly recover from it while oil crop yields remained constant with multiple transitory fluctuations.

Malawi is famous for its successful fertilizer subsidy program which was instituted in 2005. The program has been administered via a series of coupon-vouchers that enable households to purchase fertilizer, hybrid seed, and/or pesticides at greatly reduced prices. Although it received many criticisms, most evaluations claim that the program was successful (Oxfam, 2010).

Figure C.3 Malawi crop yields

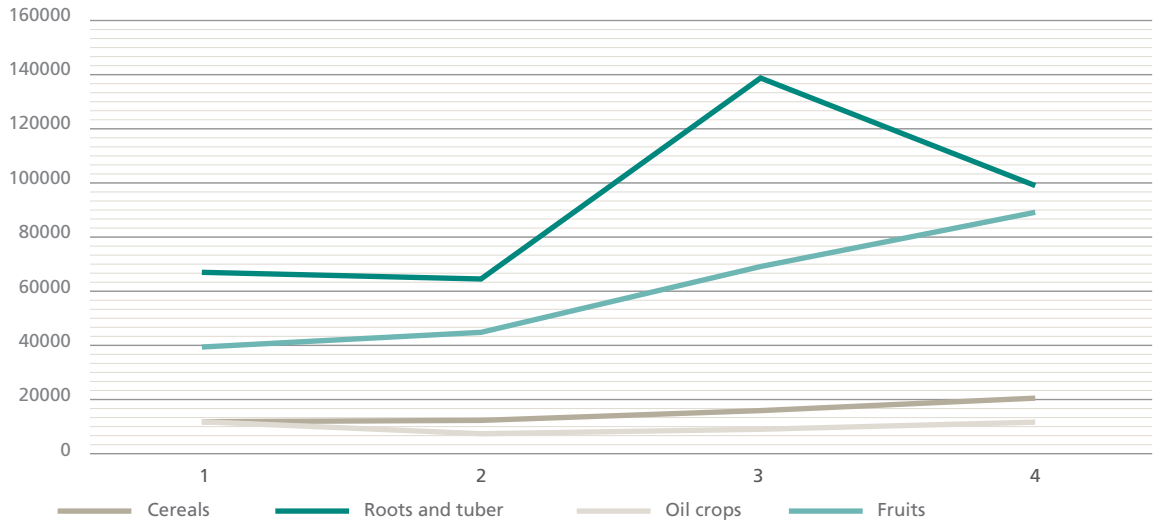


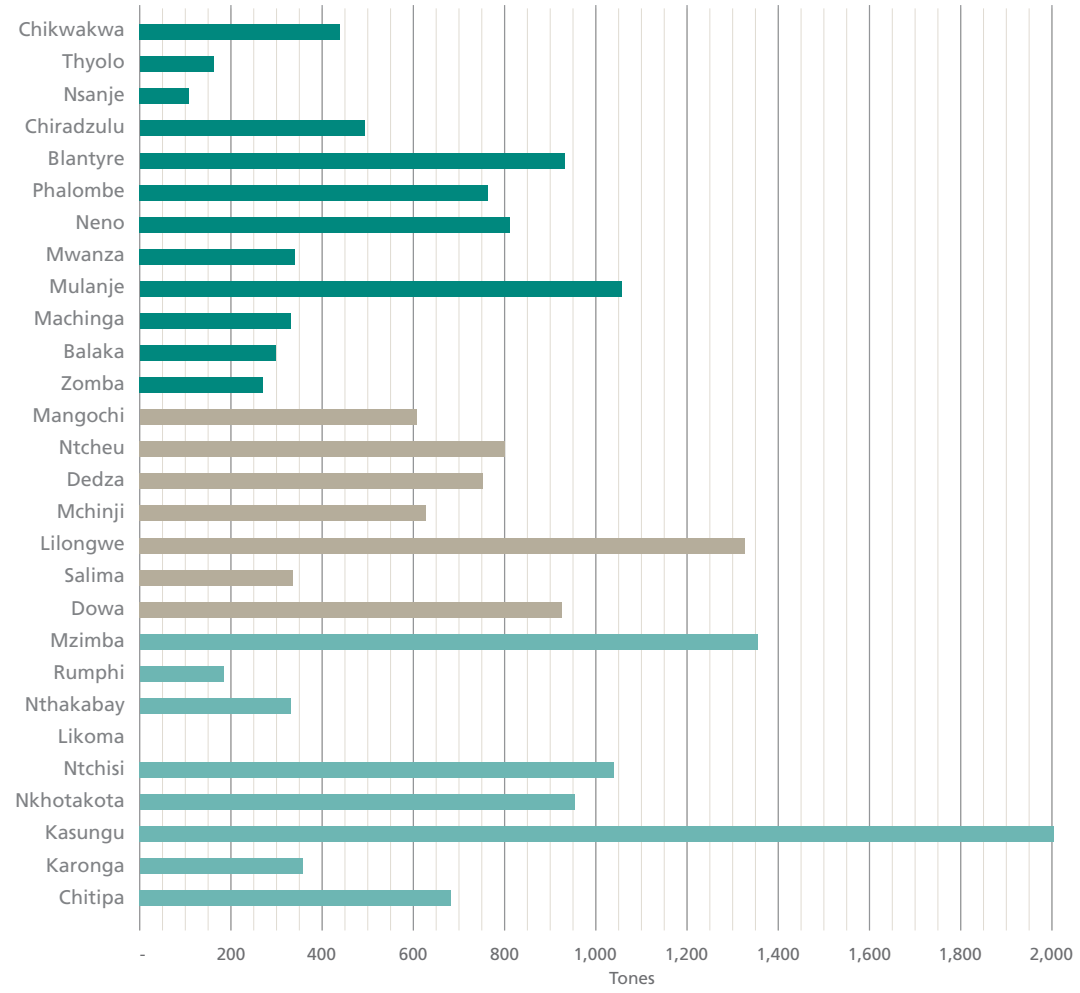
Table C.9 Crop production and yields, 2015

Crop	Production (Tonnes)	Hectares	Average yield (Tonnes/ Hectare)
Sugar	292,962	19,260	15.21
Maize	2,776,277	1,676,213	1.66
Rice	111,437	65,761	11.69
Groundnuts	296,498	373,925	0.79
Tobacco	127,195	123,111	1.03
Cotton	79,289	123,019	0.64
Other cereals	2,890,294.	1,821,399	1.59
Pulses	711,359	815,722	0.87
Coffee, spices, beans etc.	40,955	182,040	0.22
Cassava	5,012,763	222,750	22.50
Sweet potatoes	4,324,873	238,046	18.17
Irish potatoes	1,065,833	61,655	17.29
Total	17,729,735	5,722,901	-

Production within the districts

Population is growing faster in the Northern and Central districts. Growth is slower in the districts of the more densely populated Southern region as shown in Figure C.4.

Figure C.4 Total crop production per district, MT, 2016



C.2.6.2 Food security

Increasing food security is one of the main objectives of Malawi's Agricultural Sector Wide Approach (ASWAp 2010) and a strong focus on increasing maize production since the mid-2000 has resulted in rapidly increasing production. However, production risks continue to result in high losses to the sector, including for maize. Further, price interventions in the sector by the Government over the past year have implied greater price risks for producers and traders.

Food consumption per capita

Food consumption expressed in kilocalories (kcal) per capita per day is a key variable used for measuring and evaluating the global and regional food situation (FAO, 2003). Analysis of FAOSTAT data shows that dietary energy measured in kcals per capita per day, henceforth food consumption, has been increasing in Malawi. However food consumption has not been steadily increasing. In the period between 1981 and 1991, consumption decreased in Malawi and the region and this decrease could be attributed to the continent wide economic crisis that economists call the lost decade of Africa.

Table C.10 Historical total food consumption kcal/capita/day

	1961-1971	1971-1981	1981-1991	1991-2001	2001-2011
Sub Saharan Africa	2201.32	2210.82	2206.72	2236.89	2310.26
Malawi	2209.19	2345.11	2036.87	1981.62	2094.39

Malawi's current kcal/capita is 3560 for Maize.

C.2.6.3 **National food balance sheet**

The Ministry of Agriculture's national food balance sheet, which shows a deficit for Malawi as at September 2016 is shown below:

Table C.11 National food balance sheet

	Maize (MT)	Rice (MT)	Sorghum / Millet (MT)
kilocalories/kg	3,560	3,630	3,430
A. Domestic Supply	**2,384,493**	**83,630**	**77,702**
Gross Production	2,369,493	83,630	77,702
Carry Over Stocks from 2015/16	15,000	-	-
Strategic Grain Reserve (SGR)		-	-
ADMARC	15,000	-	-
Private traders	-	-	-
B. Total Utilisation (2016/17)	**3,510,800**	**75,765**	**89,567**
Food Use	2,788,086	74,913	59,461
Loses	305,665	22,496	9,480
Seed Use	67,049	852	30,106
SGR Replenishment	250,000	-	-
Feed and Industrial uses	100,000	-	-
C. Domestic Balance (A-B)	**(1,126,307)**	**7,865**	**(11,865)**
D. NET IMPORTS	294,879	13,031	20,282
Total Imports	296,500	13,800	20,702
Formal Imports	210,000	6,100	1,752
Informal Imports	15,000	1,200	950
Food Aid Imports	71,500	6,500	18,000
Total Exports	1,621	769	420
Formal Exports	-	43	220
Informal Exports	1,621	726	200
Food Aid Exports	-	-	-
E. Surplus/Deficit (C+D)	**(831,428)**	**20,896**	**8,417**
Cross Substitution	29,416	21,307	8,109
K. Total Food Surplus / Deficit	**(802,011)**		

Basic food balance sheet

Utilising similar principles to MOA's balance sheet, the calculations below shows there is an increasing deficit of maize, Malawi' staple food crops, in the forecast years.

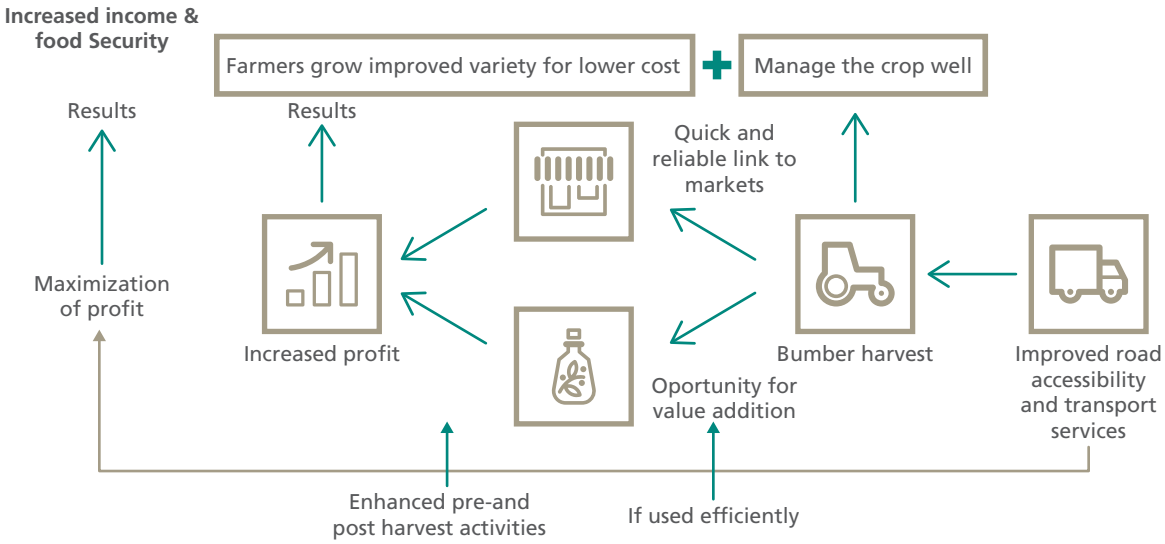
Table C.12 NTMP food balance sheet

	2016	2021	2026	2031	2036
Maize production	**2,829,947**	**3,013,894**	**3,215,825**	**3,383,048**	**3,555,583**
Production in Kilocalories (in millions)	21,836,378	23,255,746	24,813,881	26,104,204	27,435,515
Population	**16,832,910**	**19,718,415**	**23,067,018**	**26,895,288**	**31,191,010**
Calorie requirement (in millions)	21,872,683	25,622,108	29,973,283	34,947,737	40,529,598
Surplus / Deficit(in millions)	(36,305)	(2,366,362)	(5,159,401)	(8,843,532)	(13,094,082)
Surplus / Deficit in MTs	**(4,705)**	**(306,675)**	**(668,647)**	**(1,146,103)**	**(1,696,965)**

While the short-term results of improving food security in Malawi can be seen through the national fertiliser subsidy programmes, other farm input assistance initiatives and enhanced water management systems, the long-term outlook remains problematic, partly due to the fact that the Government of Malawi has not been able to develop a comprehensive food security policy.

Transport is a critical element in agricultural productivity and infrequent, expensive or poor quality transport and storage services increase product costs, damage goods, increase crop deterioration. Figure C.5 provides an overview of the role of transport in ensuring a food secure Malawi.

Figure C.5 Food security and transport



C.2.6.4 **Challenges facing the agriculture sector**

Major challenges in Malawi's crop agriculture sector include:

- Low and stagnant yields;
- Over dependence on rain-fed farming;
- Low level of irrigation development and poor water resource management;
- Low uptake of improved farm inputs and low profitability of small holder agriculture;
- Weak links to market;
- High transport costs;
- Few farmer organisations;
- Poor quality control and lack of market information;
- Low adoption of agricultural technology and farm power; and
- Lack of consistent financial resources provided through political will to enable growth of the sector.

Specific challenges relating to the transport and the agriculture sector are access to markets by farmers and high transport costs which have a myriad of effects on the productivity as follows:

- Unreliable or non-existent modes of transport. The number of goods vehicles available is insufficient to satisfy the transport demands of agricultural producers. Many factors were cited that contribute to this including the unavailability of trucks due to lack of credit facilities to purchase vehicles. Furthermore, importation of trucks is discouraged by the relatively high duties. Apart from the poor road conditions, which considerably increase operational costs to truck operators, the other problems include lack of a clear policy and Government attention to rural transport problems.

  There is however a major reliance placed on head loading; in the southern region districts like Mulanje and Thyolo transportation for produce from farm gate to local and district markets is by headload from the farm to a predetermined location for storage where Lorries/truck/Pick-ups then come to collect the produce.

  In some districts the unreliability of transport can lead to a loss of production. In Zomba, for example some crops (especially tobacco) and produce, are sometimes sold late as the lorries that transport the tobacco prefer to wait to have a full vehicle before setting off to the respective markets.
- Poor road network: The majority of farm produce in Malawi is wasted in the remote areas and by virtue of the fact that farmers find it very difficult transporting their farm produce to the market to sell. Roads often do not exist and most remote areas find themselves cut-off from the rest of the world. Because there are no proper storage facilities in the rural areas, a high proportion of perishable goods such as tomatoes, onions, leafy vegetables, tend to rot away in the remote areas.
- Cost of farm inputs: Farm inputs are costly and are made available by agro dealers who are liberty to sell their products at the prices they desire. Few programmes like the Farmer Input Subsidy Programme (FISP) and MASAF provides fertiliser and seed inputs to a small proportion of the population. Sometimes these programmes fail to meet their intended target farmers.
- Transport costs: Costs are generally high and the condition of feeder roads connecting farms to the main roads is an important factor influencing transport costs. Farmers have no bargaining power and are at the mercy of transporters who determines the price to be paid and when produce is transported.

Improving rural accessibility and road conditions is crucial to raising productivity through reductions in transportation costs and the loss of perishable produce.

C.2.7. **Mining sector growth**

C.2.7.1 **Overview**

The mining sector in Malawi is underdeveloped which is a result of years of very little investment and lack of mineral data. Significant steps have been made by the country to develop the sector which led to the opening of the Kayelekera Uranium Mine by Paladin (Africa) Limited in 2009. From the start of production through to mid-2014 when the mine was in operation, the mining sector's contribution to GDP increased dramatically, rising from 1% to 10%. However with the collapse of the spot price in uranium, the sector's growth came to a halt.

The Government development strategies have recognised the sector as a priority in both the MGDS and ERP, with emphasis being placed on the promotion of a conducive, transparent and accountable mining regime in the country. The long term goal is "to increase production and value addition of mineral resources" of the sector. The Government of Malawi identified seven key strategies aimed at growing the maximum potential of the sector and these are:

- Producing detailed geological map of Malawi;
- Strengthening institutional capacity of the sector;
- Developing an integrated data management system;
- Strengthening seismic monitoring;
- Promoting both local and foreign investment;
- Enforcing environmental, occupational health and safety in the sector; and
- Enforcing legislations on sustainable use and management of mineral resources.

Following the recognition of the sector's potential and identified key strategies, the mining sector has achieved the following:

- Launched the Mines and Minerals Policy of Malawi in 2013, whose goal is to "enhance the contribution of mineral resources to the economy so as to move from being agro-based to mineral based economy".
- Review of the Mines and Minerals Act (1981) with the aim to align it to the mining policy and among others, creating a good platform that enables enhancement of good investor/community relationships.
- Completed the Airborne Geophysical Survey that was completed in 2015 which aims at helping Malawi overcome some of the challenges faced in the mining sector by improving efficiency, transparency and sustainability. The results of the survey have yet to be released, though it is expected that some interesting geological features have been identified that were not previously known. Features of scale that could be indicative of a number of minerals, but this would need to be further understood through detailed interpretation of the existing data and follow up geophysical and drilling campaigns.
- Malawi has signed up to the Extractive Industries Transparency Initiative (EITI) and was accepted as a candidate country to the EITI global transparency standard which requires extensive disclosure and measures to improve accountability in how oil, gas and minerals are governed. This means that the country will publish accounts showing all payments the Government received from its extractives sector. Under the standard, the country will also be required to make public information about license holders, the licensing process, production data and the allocation of revenues from its natural resources.

It is important to note that the country needs to manage expectations as it takes a long time for an exploration target to become a mine and demand is strongly influenced by the global mining industry's performance, as seen with the Kayelekera Uranium Mine. The standard lead time from identification of a prospect to production can be 10 to 15 years. In this regard the availability of geophysical data and reforms in the sector should be considered as exceptionally important initial steps in a long process.

C.2.7.2 Potential for sector growth

Mineral sector growth is expected to stem from the current portfolio of mineral prospects in the country, some of which have been partly or fully evaluated. Based on the existing pipeline of mineral prospects and assuming that there will be steady improvement in the provision of infrastructure; if the world prices for the minerals that Malawi is endowed with improve; and the Government managed to create a transparent and conducive environment for investors there is huge potential for the sector to grow. Table C.13 shows the potential pipeline projects in the sector.

Table C.13 Mining sector project pipeline

Region	District	Deposit	Project description	Status
Northern	Karonga	Uranium	▪ Kayelekera Uranium Mine ▪ Open cast mine with proven reserves of 3,943Mt of contained uranium oxide as of 2008. ▪ Owned100% by Australia's Paladin Energy Limited	▪ Care and Maintenance
Northern	Chitipa	Niobium	▪ One of Malawi's largest Niobium deposits ▪ Estimate resource of 100,000 tons ▪ Uranium can be recovered as a by-product ▪ 90% of the tenement is owned by Resource Star Limited	▪ Application to extend existing tenement area was made in 2010 ▪ Unknown
Northern	Karonga and Chitipa	Oil	▪ Block 1 which is 12,265m2 and is the second largest petroleum exploration licence demarcated ▪ 100% owned by South Africa's SAC Oil Holdings	▪ Exploration stage ▪ Exploration licence divided into an initial 4 year period and 2 subsequent 3 year renewal periods
Northern	Karonga and Nkhatabay	Oil	▪ Owned by Hamra Oil and entails the exploration in blocks 2 and 3 oil exploration onshore ▪ Completed fuel tensor gravity survey	▪ Exploration work was suspended following a Presidential Order
Northern	-	Oil	▪ RAK GAS MB45 is owned by UAE Oil and entails the exploration in blocks 4 and 5	▪ Exploration work was suspended following an order from the Ministry of Natural Resources, Energy and Mining
Northern	-	Oil	▪ Owned by Pacific Oil Limited entails exploration in block 6	▪ Exploration did not commence following suspension of oil exploration works by the MoNREM
Central	Kasungu	Cement	▪ Owned by Shayona Cement ▪ Livwezi and Chikowa deposits ▪ Expansion project aimed at increasing mined quantities to 650 tons in phase1 and 1200 tons in phase 2	▪ Operational
Central	Lilongwe	Graphite	▪ One of the largest, high-grade, flake graphite deposits in the world based on the JORC Mineral Resource estimate ▪ 100% owned by Australia's Sovereign Metals Limited ▪ Can support a base case scenario with graphite concentrate production of over 110,000tpe over an initial mine life on 20 years	▪ Pre-feasibility and feasibility studies yet undertaken ▪ Scoping study to examine production scenario of 30,000tpa and expanded scenario of 65,000tpa
Northern	Mzimba	Niobium	▪ 100% owned by Australia's Globe Metals and Mining Limited ▪ Field exploration and bulk sampling completed successfully ▪ Estimated 60 million toned of ore grading 0.29% niobium metal ▪ The largest niobium mineral resource in Malawi ▪ By-products include uranium and tantalum	▪ Mining licence granted ▪ Development agreements negotiations ongoing
Southern	Phalombe	Rare Earth Elements	▪ Annual processing capacity assumed at 500,000 tpa of ore ▪ Mine life of 18 years ▪ Average annual production REO in concentrate of 2,841 tonnes ▪ Average "magnet" REO production in concentrate of 1,026 tonnes	▪ Exploration licence ▪ Pre-feasibility study completed in November 2014

Region	District	Deposit	Project description	Status
Southern	Nsanje	Titanium	▪ Owned by Crown Minerals limited ▪ Deposit is located between Ndiola and Chimbwimbwi rivers ▪ Indication of Rutile, ilmenite, apatite and zircon deposits	▪ Metallurgical test work continues
Northern	Karonga	Coal	▪ Nkachira Coal mining project owned by Malcoal Mining which is a joint venture between Australia's Intra Energy Corporation and Malawi's Consolidated Mining Limited ▪ Total core resources reported are 38.4 million tons based on the JORC Mineral Estimate ▪ Mine was intended to feed into Intra Energy's Pamodzi Coal Fired Power Project at Chipoka in Salima, aimed at producing 120MW	▪ Mining licence granted ▪ 5 Exclusive Prospecting Licences (EPLs) ▪ Discussions commenced in early 2016 in relation to the sale of the Malawian subsidiaries with a view to the long term supply of coal to the 120MW power station from its Tancoal Mine (Tanzania)
Northern	Rumphi	Coal	▪ Owned by Mchenga Coal Mines ▪ Mines 3,000 tons per year and has a production capacity of 6,000mt/mth ▪ Coal is sold locally to tobacco, textiles, cement, food and beverage manufactures,	▪ Raising investment to expand coal output and develop an 80MW coal fired power plant
Southern	Mulanje	Rare Earth Elements	▪ 100% owned by Canada's Springstone Limited	▪ Exploration licence granted
Central	Ntcheu	Limestone	▪ Bwanje Cement Company Limited owns the project ▪ 28MT indicated cement grade limestone deposit ▪ Planned plant capacity of 500,000MT annual capacity production	▪ Mining licence awarded in 2010 ▪ Environmental approval obtained from Department of Environmental Affairs ▪ In discussions with various potential partners for the right mix of financing and technical expertise to take the project forward
Southern	Balaka	Rare Earth Elements	▪ 100% owned by Australia's Lynas Corporation Limited ▪ Mining Licence granted in 2010 ▪ Inferred Resource of 107,000 tons of REO ▪ Deposit also contains strontianite and phosphate minerals ▪ Environmental Licence granted in 2013	▪ Care and Maintenance

C.2.7.3 Recommendations

In order for the country to transform its significant resource endowment into a global competitive advantage, an enabling environment needs to be created to attract significant investment in the sector:

- Ensure that mining companies have the ability to find, extract and remove ores at a competitive cost by providing dependable and cost effective energy and transport infrastructure as these two inputs are an integral part of the sector; and
- There needs to be a platform for dialogue created to build trust among the various players in the sector, starting from a common knowledge about how the industry works, including sources, uses of mining revenues and operational facts. The initial knowledge sharing could include:
  - The mining life cycle, from exploration through development and construction, to operations, closure and post closure;
  - Financial flows within the sector including how a mining company finances its activities, cost and revenues associated with operations, and financial reporting requirements within the company and to and Government agencies;
  - Environmental and social issues and opportunities and related roles and responsibilities of mining companies, the Government and civil society; and

- Process issues and techniques related to how potentially contentious issues can be discussed in inclusive, participatory and non-confrontational ways.

C.2.8 Tourism sector growth

According to the World Travel & Tourism Council, the travel, hospitality and leisure industry is a key driver of the global economy. The industry encompasses a variety of services, including accommodation (such as hotels, casinos, cruises and resorts), food and beverages and other value-added services.

- The total contribution of Travel & Tourism to GDP was US$7,170 billion (9.8% of GDP) in 2015, and is forecast to rise by 3.5% in 2016, and to rise by 4.0% pa to UUS$10,986.5 billion (10.8% of GDP) in 2026.
- IN 2015, the total contribution of TT to employment globally, including jobs indirectly supported by the industry, was 9.5% of total employment (283 million jobs). This is expected to rise by 2.2% in 2016 to 290mn jobs by 2.5% per annum to 370mn jobs in 2026 (11% of total).
- Visitor exports generated US$1,308 billion (6.1% of total exports) in 2016. This forecast to grow by 3% in 2017, and grow by 4.3% per annum, from 2016-2026, to US$2,056 billion in 2027 (6.2% of total).
- Travel & Tourism investment in 2016 was US$774.6 billion, or 4.3% of total investment. It should rise by 4.7% in 2017, and rise by 4.5% pa over the next ten years to US$1,254.2 billion in 2027 (4.7% of total).
- Globally renewed consumer confidence, along with a shift in household spending from goods to services and experiences helped leisure travel sustain a growth rate well ahead of gross domestic product (GDP).

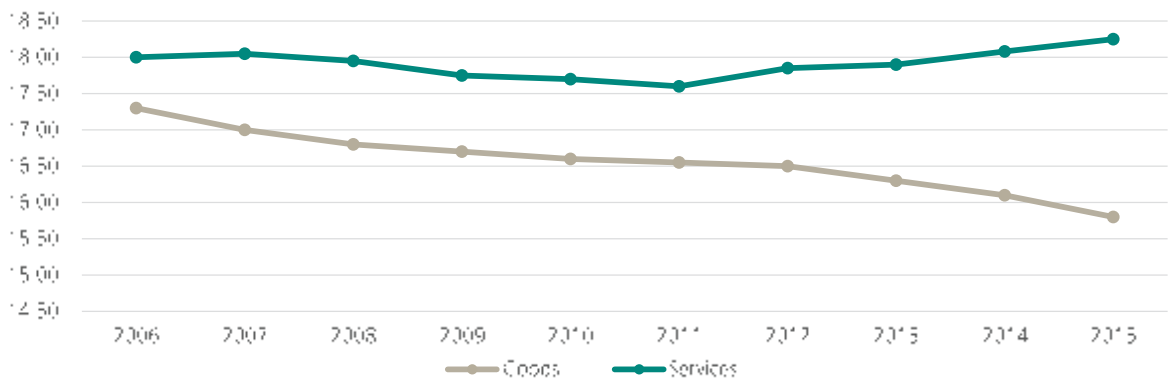
The Travel & Tourism sector is forecast to grow, in terms of GDP contribution, by 4% on average per year over the next ten years, continuing to outperform the global economy throughout the forecast period. The divergence in growth between economy-wide GDP and direct Travel & Tourism GDP is expected to widen relative to the last few years to 1.4 percentage points, as the components of Travel & Tourism GDP continue to grow more quickly than their macro economy counterparts and other sectors.

By 2026, Travel & Tourism is expected to support 370 million jobs in total globally, which will equate to 1 in 9 of all jobs in the world.

Present Hotel Industry in Malawi:

- GDP: Total contribution - The total contribution of Travel and Tourism to GDP was MWK289,738mn(US$409 million), 7.2% of GDP in 2016, and is forecast to rise by 4.1% in 2017, and to rise by 5.0% per annum to MWK493,575mn (US$696.7 million), 7.2% of GDP in 2027.
- Employment: Total contribution – In 2016, the total contributing of Travel & Tourism to employment, including jobs indirectly supported by the industry was 6.2% of total employment (471,000 jobs). This is expected to rise by 3.2% in 2017 to 486,500 jobs and rise by 3.2% per annum to 669,000 jobs in 2027 (6.2% of total).

Figure C.6 World consumer expenditure (percent of total household expenditure)



Source: Bureau of Labour Statistics, 2016. Note: Goods include food and drinks, tobacco, clothing and footwear, and household goods. Services include communications, leisure and recreation, and hotels and catering.

Figure C.7 TT's contribution to GDP

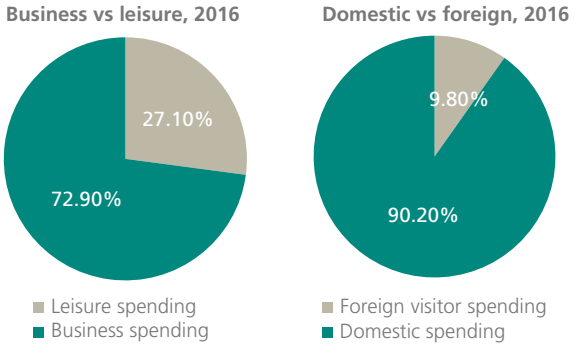
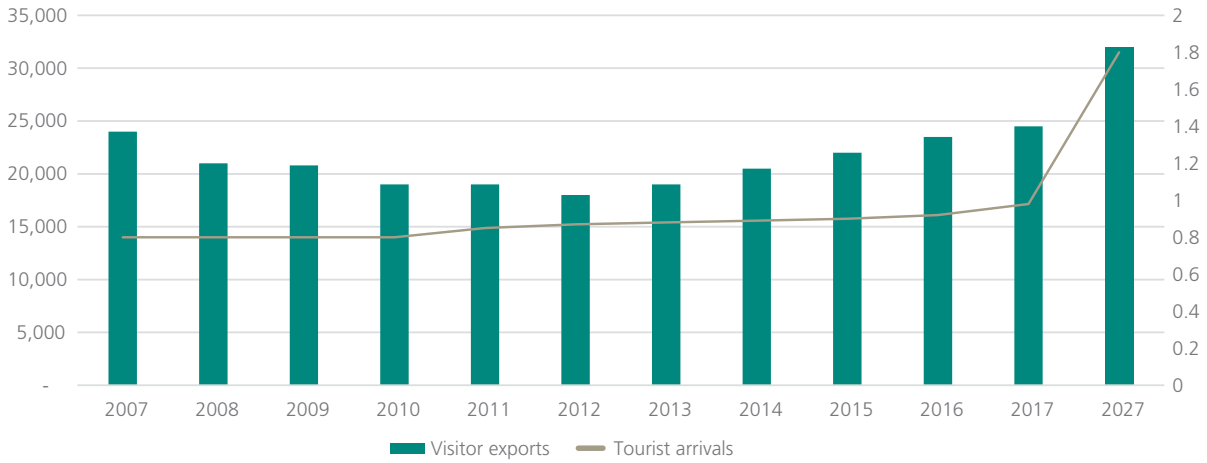


Figure C.8 Visitor exports and international tourist arrivals



In 2017 the country is expected to attract 969,000 international tourist arrivals. By 2027, international tourist arrivals are forecast to total 1,898,000, generating expenditure of MWK32,246mn, an increase of 2.8% per annum.

Travel & Tourism investment in 2016 was MWK20,423.5mn, 4.0% of total investment (USD28.8mn). It should rise by 3.7% in 2017, and rise by 4.0% pa over the next ten years to MWK31,306.2mn (USD44.2mn) in 2027, 3.6% of total.

Source of demand and related marketing strategy - The 2013 Economic Impact of Travel and Tourism Report published by the World Travel and Tourism Council has reported that visitor exports generated MWK16 billion (3.5% of total exports) in 2012.This is forecast to grow by 5.3% in 2013, and grow by 3.4% pa, from 2013-2023, to MWK23.5 billion in 2023. The principal growth opportunity is in the business sector which represents 72% of the market, followed by international visitors contributing 33% of expenditures and finally personal travel and tourism at 17%. Business demand is composed of Government, donors and the private sector and each of these will be analysed in turn.

In Malawi the Government has always been the largest contributor towards domestic expenditure and an analysis of each respective ministry's contribution towards the national hotel accommodation industry according to Deputy Budgets as shown above.

The top 20 ministries and the Government agencies represent 75% of the Government expenditure on hotel costs and the related expenditure was estimated at K1.1 billion in 2008 and is predicted to grow rate of 21% percent per annum. The Ministry of Health and Population, Ministry of Education, Ministry of Agriculture, Police Services and State Residences are amongst the highest spenders and as such from a marketing point of view these are the ministries that will be targeted.

The Director of Human Resources for Government indicated that expenditure of the budgeted items is coordinated at the ministry level. On a day to day basis this is carried out by the Human Resources / Payroll staff who issue out cheques or cash to travelling personal. The strategy that will therefore be adopted is to visit these ministries to interface with the Human Resources / payroll staff. Furthermore, most Government headquarters are housed at Capital Hill in Lilongwe and as such the placing of a bill board near the entrance to the complex will prove to be effective in marketing the hotel and press advertising will also be adopted for the purpose of promoting Amaryllis Hotel and Conference Centre to the civil service. In accordance with laid down procedures YIL will be duly registered with all the Government departments.

Donor Community Demand - Donor activity in Malawi is a key source of business in terms of conferences and travel in the execution of their projects and programmes. According to AIDA and the Council for Non-Governmental Organisations in Malawi (CONGOMA), the top 20 donors and NGO's in Malawi are as follows:

Figure C.9 Government spending on hospitality

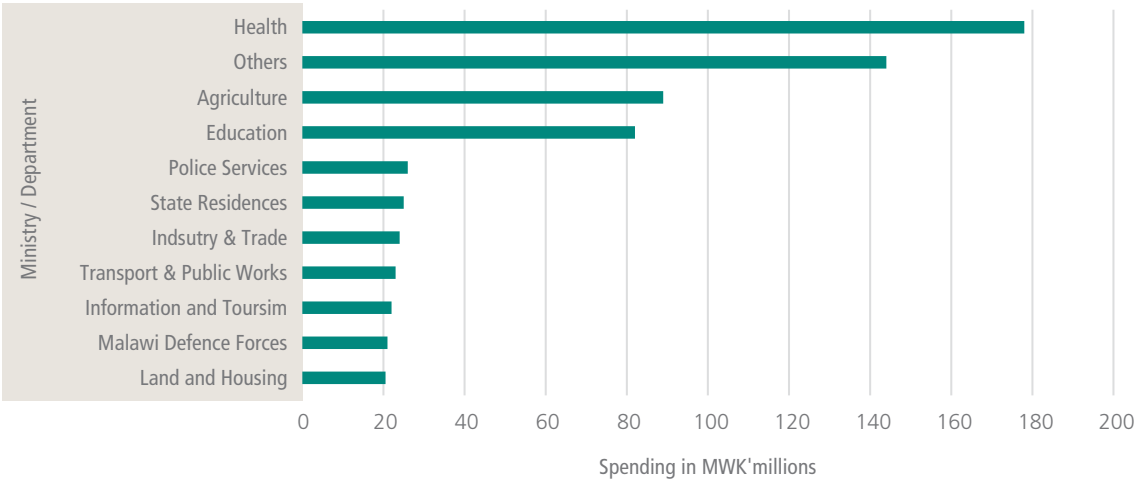
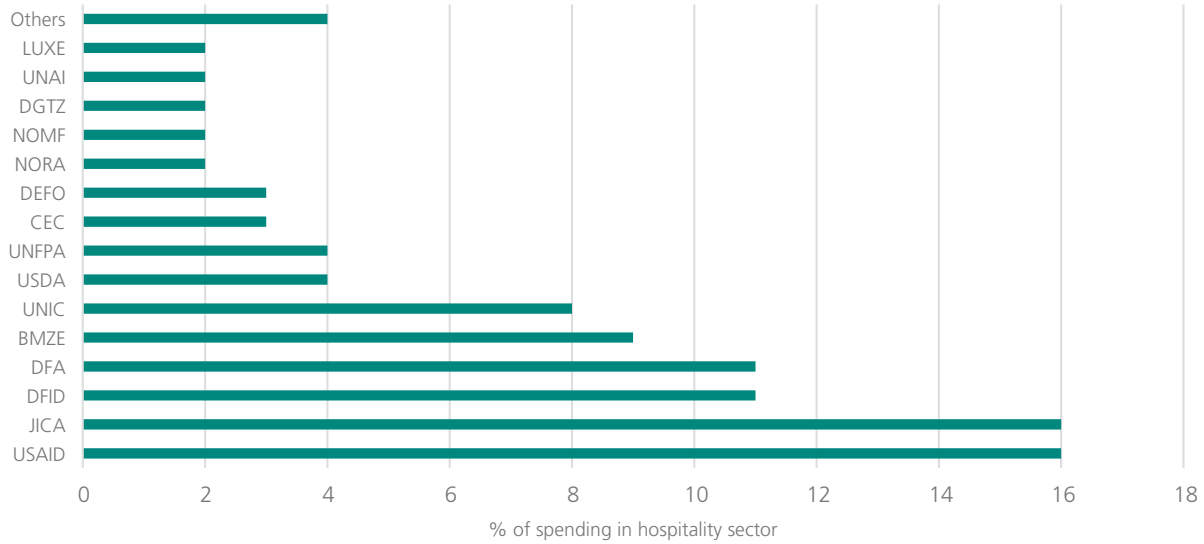


Figure C.10 Donor spending on hospitality



The top 10 donors in the country are responsible for more than 85% of the donor activity in Malawi and include United States Agency for International Development (USAID), Japan International Cooperation Agency (JICA), Department for International Development (DfID), Department of Foreign Affairs – Irish Aid (DFA), Ministry for Economic Cooperation and Development - Germany (BMZ), United Nations Children's Fund (UNICEF), United States Department of Agriculture (USDA), United Nations Population Fund (UNFPA), Education and Commission – Switzerland (CEC) and DEFO, and these will be targeted in particular from a network marketing perspective. YIL will be duly registered with the donor community at large and promotional and marketing activities will be specifically focused on donor community requirements.

Business Community demand - As far as business from the private sectors is concerned, the Malawi Confederation of Chambers of Commerce and Industry's classification the top 20 companies is as follows: National Bank of Malawi, Airtel Malawi Limited, TNM Malawi Limited, Standard Bank Malawi Ltd, Eastern Produce Limited, Press Corporation Limited, Puma Energy, IndeBank Limited, First Merchant Bank Limited and Illovo Sugar Ltd. These businesses will be targeted both through advertising in the daily press and direct marketing. YIL will also attend expos and business conferences.

International visitors demand - International visitors represent 17% of the tourism demand in Malawi and the number of international visitors in 2009 totalled 755,000 and the related numbers using a particular type of accommodation is as follows:

Type of Accommodation Used	Number	%
Hotel / Inn / Lodge	202,000	27%
Rest House	174,300	23%
Private House	308,400	41%
Other/No Accommodation	70,000	9%
Total	755,000	100%

Table C.14 Tourism GDP contribution

Indicator	2015 Income (MWK million)	2016 forecast growth rate (%)	2026 Forecast Income (MWK million)	Annual Forecast growth rate (%)
GDP: Direct contribution	105,029	2.9	202,832	6.5
GDP: Total contribution	221,096	4.2	433,181	6.5

Source: World Travel & Tourism Council: Travel & Tourism Economic Impact 2016 Malawi.

The tourism sector can contribute towards growth for the country. The sector is a growth engine as it contributes significantly to GDP, export earnings, employment, human and physical capital investment. Tourism's positive contribution to economic growth include:

- Producing foreign exchange earnings that are essential to import both consumer and capital goods;
- Facilitates the use of resources that are in live with the factor endowment of the country;
- Creates job opportunities;
- Promotes improvements in the infrastructure, benefitting not only tourists but also residents;
- Is a conduit for transferring new technological and managerial skills into the economy; and
- Potential to create a positive linkage with other sectors of the economy.

The GDP data for the sector is detailed in Error! Reference source not found. below:

- In 2015, the sector directly supported 205,000 jobs representing 2.8% of total employment and this is expected to rise by 0.9% in 2016 and 3.3% per annum to 287,000 jobs in 2026; and
- Total contribution of the sector to employment, including jobs indirectly supported by the industry was 446,500 jobs representing 6.2% of total employment and this is expected by 3.4% per annum to 634,000 jobs in 2026.

Despite its potential and priority status, the country's tourism sector continues to face a lot of challenges, such as limited air access for visitors, high air fares and no internationally recognised airport.

Transport is a particularly important area of linkage with the tourism. Improving transport infrastructure and services primarily to accommodate and boost tourism and bring positive benefits for other sectors of the economy, for example in the aviation subsector where the airline services are largely dependent on passenger numbers these same airline services can provide freight capacity for exports, provided the type of plane in use has cargo facilities.

Majority of hospitality and accommodation providers that were consultated have an average occupancy rate of less than 40% in a given year. There are a vast amount of accommodation services that are not being utilized to their full potential. These establishments do not only provide accommodation services but also a range of other activities for their guests once they have checked in. One would think this encourages more visitors; however, there seems to be very little awareness in the international about what Malawi has to offer to tourists.

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