

THE STUDY ON URBAN DEVELOPMENT MASTER PLAN FOR LILONGWE IN THE REPUBLIC OF MALAWI

FINAL REPORT *Main Text*

SEPTEMBER 2010



JAPAN INTERNATIONAL COOPERATION AGENCY
KRI INTERNATIONAL CORP.
NIPPON KOEI CO., LTD.



**GOVERNMENT OF THE REPUBLIC OF MALAWI
MINISTRY OF LOCAL GOVERNMENT AND RURAL DEVELOPMENT**

LILONGWE CITY COUNCIL

**THE STUDY ON URBAN DEVELOPMENT MASTER PLAN
FOR LILONGWE IN THE REPUBLIC OF MALAWI**

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JICA rate, February 2010

PREFACE

In response to the request from the Government of the Republic of Malawi, the Government of Japan decided to conduct the “Study on Urban Development Master Plan for Lilongwe in the Republic of Malawi”, which was entrusted to the Japan International Cooperation Agency (JICA).

JICA selected a study team consisting of the joint venture (JV) between KRI International Corp., and Nippon Koei Co., Ltd. The team, headed by Mr. Isamu Asakura of KRI International Corp., was dispatched to Malawi during the period from June 2009 to September 2010.

The team conducted field surveys and formulated the comprehensive urban master plan of Lilongwe based on the consensus built in a series of discussions with concerned officials of the Government of the Republic of Malawi, donor community members, citizens, and other stakeholders, through workshops, seminars, and exhibitions. This final report was prepared based on the result of the intensive analyses of all the data and information obtained during the study, and offers a set of recommendations for the comprehensive improvement of the City of Lilongwe.

I hope that this report will contribute to the prosperity of the City of Lilongwe as the capital city of the Republic of Malawi and towards becoming the gateway to its neighboring countries. I also hope that the cordial relationship between our two countries has been strengthened by this collaborative study.

Finally, I wish to express my sincere appreciation to the concerned officials of the Government of the Republic of Malawi for the close cooperation they extended to the study team.

September 2010

Kiyofumi KONISHI
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

September 2010

Mr. Kiyofumi Konishi
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

Letter of Transmittal

Dear Sir,

We are pleased to submit herewith the Final Report on the “Study on Urban Development Master Plan for Lilongwe in the Republic of Malawi”.

The study was jointly carried out by the JV between KRI International Corp. and Nippon Koei Co., Ltd., under a contract with your Agency for a fourteen-month period from June 2009 to September 2010.

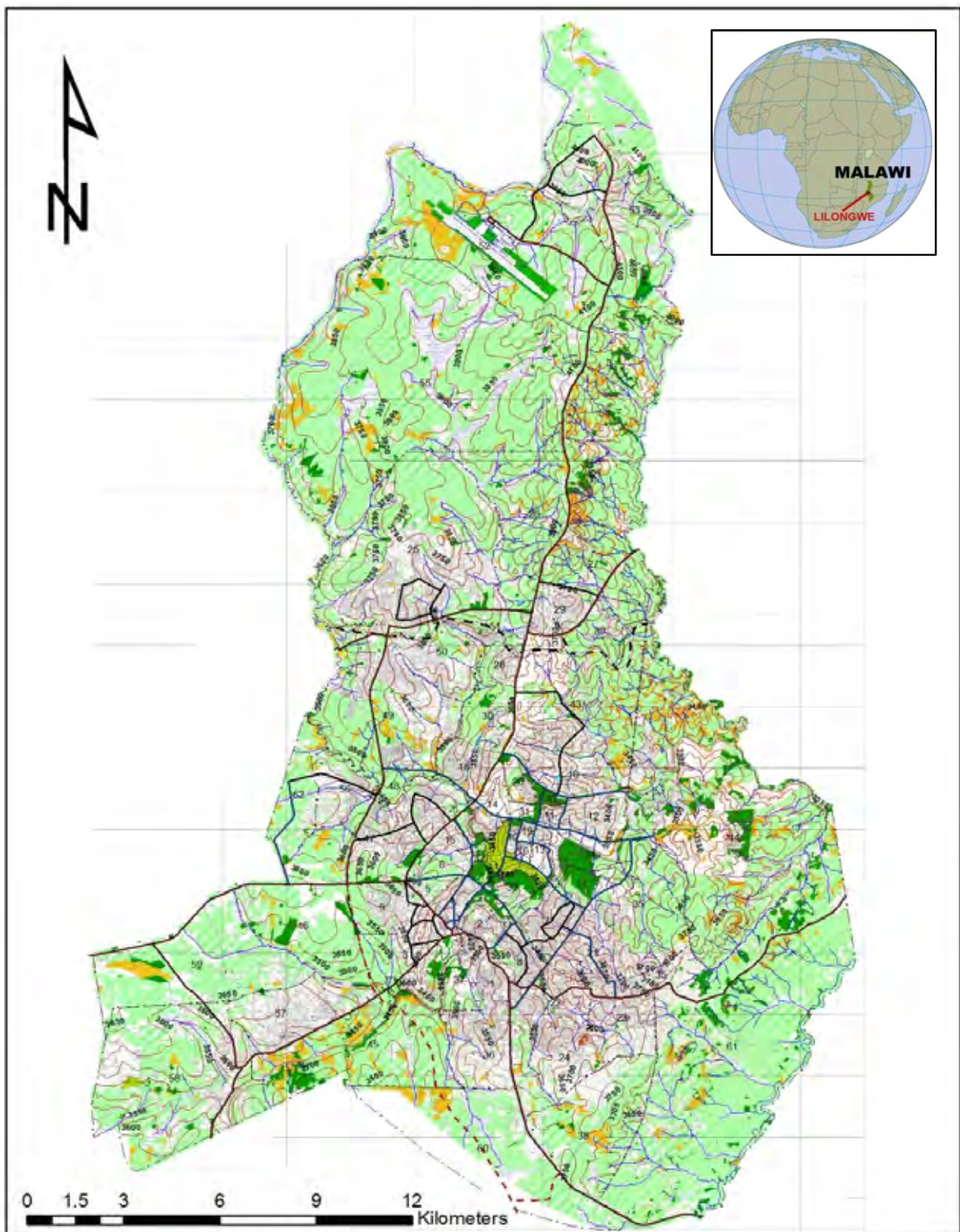
The study aimed at the formulation of a comprehensive urban development master plan of Lilongwe and the development programs for urban transport development, water supply and sewerage development, enhancement of living environment, and environmental management. The study carefully endeavored on information dissemination and consensus building by participatory method with regards to the contents of the master plan, results of the pre-feasibility study, social and environmental considerations, etc. through a series of seminars and workshops. Representatives from government agencies, donors, and NGOs, leaders of community development committees, members of the Parliament and traditional chiefs participated in the seminars. It was recommended during the seminars that the master plan should be implemented as soon as possible through an undertaking of the Government of Malawi in cooperation with stakeholders.

This final report is the fruit of the continuous effort of all stakeholders for this study. We wish to take this opportunity to express our sincere gratitude to your Agency, the Embassy of Japan in Malawi, the JICA Malawi office, the MoLGRD, Lilongwe City Council (LCC), and the others concerned in the Republic of Malawi, for their valuable support provided to the study.

Finally, we genuinely wish that the master plan will be realized towards the development of Lilongwe, and that the friendly relationship between Malawi and Japan will continue.

Yours very sincerely,

Isamu Asakura
Team Leader
The Study on Urban Development Master Plan
for Lilongwe in the Republic of Malawi



Location Map

Present Photos and Future Images



Nature Reserve in the Heart of the City



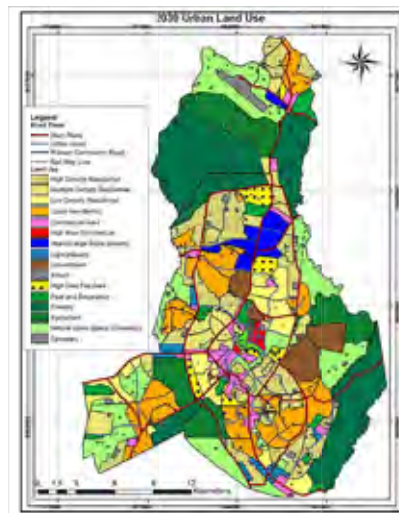
Steering Committee in LCC



Future Image of Lilongwe
(Green Preservation for Environmentally-Friendly Urban Development)



Urban Arterial Road with Heavy Congestion



Lilongwe City Land Use Plan for 2030



Future Image of Lilongwe
(High-rise Business/Commercial Area)



Current Business/Commercial area



Seminars for Stakeholders



Future image Lilongwe
(Industrial Park for Small/Medium Scale Industries and Logistics Centre)

Executive Summary -Conclusions and Recommendations

1. Development Target

The development targets of Lilongwe City toward 2030 are set as described below:

- To achieve the status as the primary city of Malawi,
- To be the capital city harmonizing environment preservation, economic and social development,
- To become the international gateway of Malawi to its neighbouring countries.

2. Development Framework

The population of Lilongwe City was 674,000 as per the census year of 2008 and is estimated to increase to approximately 1.6 million in 2030. The economically active population in the year 2030 would accordingly increase to 640,000 or about three times of the 2008 figure of 210,000.

3. Lilongwe Urban Development Strategy

- Due to the present low density land use in the central areas of the Old Town and City Centre, urban concentration in these areas is expected to continue. This will positively benefit the efficient use of urban infrastructure and the realization of a low-cost and effective urban development. However, in case the city's population increases to more than two to three million after 2030, adverse effects of traffic congestion, for instance, will be serious, causing irreversible damage to urban activities. The planned dispersion of the new city centre in a satellite development should be discussed as the city's development strategy sometime after 2030.
- In order to secure job opportunities to accommodate increase in labour force, the business and commercial, manufacturing and logistics sectors should be enhanced. Expansion of the existing industrial land uses in the Kanengo area and new developments of the logistics/distribution industry along Nacala corridor, which is under development to serve as a South African Spinal Road, will contribute to the expansion of the formal sector employment in the city.
- To diversify urban functions of Lilongwe City as the national capital, commercial and business zones of a high order should be developed through the utilization of vacant lands in the central area and reuse of urban factories' plots after their relocation. Development of an international tourism base near the international airport will be an opportunity to promote this diversified urban function.
- Poor living conditions in Traditional Housing Areas (THA) and unplanned settlements should be upgraded to improve the urban environment in respect of urban amenity. Encroachment by unplanned settlements should be controlled through strict land use and building construction management to constrain further expansion of the poor residential environment. Enhancement of building control measures through capacity upgrading of Lilongwe City Council (LCC) before the urban infrastructure development, is necessary to limit the unplanned settlement and properly guide the planned urban settlement.
- For the realization of eco-friendly urban development, which balances natural environment preservation and urban development, the existing greenery resources such as the nature reserves and waterfront greens in the central area should be strictly protected.
- To support the living environment improvement and achieve economic growth in the City, infrastructure and utilities development should be accelerated.
- To implement the development strategy above, capacity development of LCC in city planning, management, control on land use and building construction should be done.

4. Land Use Plan

Urban Structure

Urban development in Lilongwe is concentrated in the Old Town area with the adjoining City Centre. On this basis, efficient use of land and urban infrastructure in the central area should be encouraged. An effective, albeit low cost urban development in the central area should be realized in the subsequent 20 years until 2030.

Land use efficiency should be improved by introducing high-density commercial and business land use in the central area. Meanwhile, residential areas will absorb the increasing population not only in the central area but also in the adjacent vicinities. In between the different land uses, reserved and agricultural greens should be utilized as buffer areas, forming the cluster shape land use to achieve a balanced development with environmental preservation and economic/social development.

Land Use Plan

Principles hereunder were applied in the land use plan formulation.

- Acceleration of densification in the centre city of the Old Town and the City Centre areas,
- Introduction of some indices of urban planning and building control for the increase of land use efficiency in the Old Town and City Centre areas,
- Expansion of business and commercial, manufacturing and logistics sectors for the enhancement of urban economic development,
- Development of commercial and business zones to a high order in order to realize diversified urban functions in the capital city,
- Improvement of living environment in THA and unplanned settlement, and prevention of further encroachment by unplanned settlement through new land use zoning category and strict control on land use and building construction, and
- Preservation of the existing greenery resources such as nature reserves and water front greens for the realization of eco-friendly urban development.

Institutional improvement for land use and building construction control is necessary as proposed hereunder for the implementation of the land use plan.

- Introduction of new zoning categories such as high-rise residential area and high-rise commercial area, where multi-story buildings are to be built
- Current industrial zoning category will be divided into two categories, namely, heavy/large scale industry and light industry areas
- Allocating night-time population (living population) in the City Centre areas currently utilized specifically for business and administrative land use
- The unplanned residential area to be gradually legalized is categorized as quasi-residential area.
- Introduction of various categories for green preservation and park development such as forestry land use, park and recreation land use, natural open space land use, etc.
- Introduction of new control guidelines on land use/development and building construction, i.e.: 1) a guideline for building use control based on land use zone category is newly introduced, 2) building coverage ratio (BCR) by land use category is introduced instead of the current universal ratio (33%), 3) concept of floor area ratio (FAR) is proposed, 4) the existing minimum lot size standard should be reviewed and a maximum plot size regulation should be established to achieve land use densification and efficiency, 5) plot design measures such as building height, building line set back, and car parking space in accordance with new land use category is also proposed.

5. Urban Development Program

Four development programs with eight sub-programs are proposed hereunder to realize the urban development strategy and land use plan.

- Public Administration Enhancement Program for Urban Management
 - Institutionalization of Urban Development Master Plan Sub-Program
 - Capacity Development Sub-Program for Effective Urban Management
- Urban Living Environment Improvement Program
 - Living Environment Improvement Sub-Program in THA/Unplanned Settlement
 - Urban Transportation and Urban Utility Services Upgrading Sub-Program in Planned Settlement
- Economic Infrastructure Enhancement Program for Economic Growth with Urban Transportation
 - Urban Transportation Capacity Strengthening Sub-Program
 - Urban Utility Improvement Sub-Program
- Urban Environment Enhancement Program for Creation of Attractive Capital City
 - Park and Green Development Sub-Program
 - Natural Greenery Preservation Sub-Program

The total cost for the implementation of the development program is estimated to be MWK 60 billion (equivalent to US\$419 million). About MWK 36 billion and MWK 23 billion will be necessary for urban living environment improvement program and economic infrastructure enhancement program for economic growth, respectively. About MWK 24 billion out of MWK 60 billion will be necessary in short term period by 2015.

Cost Estimate of Development Program

(MWK billion)				
Program	Short	Medium	Long	Total
1. Public Administration Enhancement Program for Urban Management	0.42	0.02	0.01	0.46
2. Urban Living Environment Improvement Program	9.71	9.99	16.48	36.19
3. Economic Infrastructure Enhancement Program for Economic Growth	13.49	2.36	7.28	23.14
4. Urban Environment Enhancement Program for Creation of Attractive Capital City	0.06	0.05		0.11
Total (MWK billion)	23.69	12.43	23.78	59.90
Equivalent to US\$ million	165	87	166	418

Note: Exchange rate: 1USD =Y90.14= Euro1.40 =143.31 MWK as of Feb. 2010

Source: JICA Study Team

The following projects are selected and proposed as priority projects for the implementation of development programs.

- For the public administration enhancement program, legalization of this master plan is the most urgent priority. Capacity development concerning urban planning and development management and institutional strengthening for project implementation are also important for the master plan implementation.
- For the urban living environment improvement program, institutional strengthening of the land registration system, and fund creation for the upgrading of THA and the quasi-residential area, etc. are necessary for the THA and unplanned settlement.
- Urban transportation development and utility development and rehabilitation are projects necessary for the implementation of both THA/unplanned settlement and planned settlement. Urban transportation development and urban utility

development are also necessary for the economic infrastructure development for the economic growth. In particular, road widening of north-south axis road (M1) in the vicinity of the Old Town and the City Centre is an urgent project.

- For the urban environment enhancement for the creation of attractive capital city, park and green development, afforestation of barren land, and rehabilitation of river side trees are considered as vital projects.

The major implementing organization in charge of the project will be LCC, Roads Authority (RA) and Lilongwe Water Board (LWB). LCC will play a significant role in the implementation of all programs, while RA and LWB will implement major road network development and water supply system improvement, respectively.

6. Sector Development Plan

Capacity Development Plan

LCC is the major stakeholder to attain good governance of urban development in Lilongwe City. The capacity development required for LCC will be i) legal and institutional arrangement for the new zoning scheme, and implementation of infrastructural development plan caused by the change in planning conditions, ii) improvement of LCC's administrative capacity in the areas covered by planning guideline and enforcement of land use/building control; land registration system for the new zoning scheme, such as quasi-residential area and high population density area where THA is to be incorporated; and empowerment of staff members' capability in road and urban utility development, and iii) LCC's management for living environment improvement in THA and unplanned settlement. Enhancement of LCC administration is the pre-condition to both legal and institutional arrangements of the new zoning scheme and LCC's management for the issues on THA and unplanned settlement.

Urban Transport Development Plan

Improvement of the urban transportation network is necessary to contribute to an orderly urban development and to accomplish efficient and convenient transport services in Lilongwe City.

- To cope with the increasing traffic, enhancement of public transportation and improvement and development of road network should be done.
- In the central area of the City, the current road traffic already exceeds the road capacity. Improvement of the road network in the central area should thus be done urgently.
- Inner and outer ring roads will be developed as detours for through traffic. Entrance to the central area by cargo trailers coming from the Kanengo industrial area heading to the south direction, should be strictly controlled,
- Public transport should be improved by means of reorganization of mini-bus routes, introduction of large bus services in the City, and expansion of the mini bus terminal. Construction of an integrated bus terminal should also be carried out.

Urban Utility Development Plan

Water demand of Lilongwe City in 2030 will increase to 210,000 m³/day from the present 80,000m³/day in line with population increase and economic expansion.

- The maximum water supply volume from the existing two dams located at Lilongwe River is 85,000 m³/day. The treatment capacity of their two plants is 95,000 m³/day; therefore, a shortfall will soon arise.. New water sources and new water treatment plants (WTPs) must be developed without delay.

- A feasibility study is now on-going for the new source development and water purification plant under the World Bank (WB)-funded National Water Development Program (NWDP) II. In addition, the service extension and development component and non-revenue water (NRW) reduction programs are included in the ongoing European Union (EU)-funded MPUWSP project.
- The current operating capacity for the sewage treatment plant is only 6,100 m³/day. To cope with the future sewerage demand of 121,000 m³/day, expansion and new construction of the sewage treatment plant are apparently necessary. Preparation of a sewerage and sanitation sector master plan is included in the WB-funded NWDP II to be concluded by 2012. However, there is an urgent need for capacity development of LCC in the field of sanitary management.
- Solid waste disposal work by LCC covers mainly low/medium density residential and commercial/business areas. Garbage collection rate in the City is around 30% on average, although there is minimal collection from the high density residential areas and almost no collection from the unplanned residential areas. As the final dumping site has enough capacity, the problem to tackle within the short-term period is the improvement of collection rate. LCC has full responsibility for the solid waste disposal management; however, its capacity is insufficient. A strong institutional capacity supported by adequate skills base and vigorous institutional enhancement is essential to deliver better services.

7. Recommendations

1) Realization of land use plan, development programs, and projects proposed in this study will be done on the basis of the empowerment of urban planning/management and project development/management capacity of LCC. Therefore, capacity development program concerning legalization of the urban development master plan, urban planning and land development control and project management are issues to be tackled urgently and with highest precedence.

2) Considering that urban development demand will increase drastically due to the rapid population increase and economic expansion in the near future, implementation of urban development master plan and land use plan proposed in this study will be essentially important for the construction of attractive and functional urban environment. So, to assure the realization of this master plan, it should be legalized and formalized as a principal text for the development of Lilongwe City.

3) Living environment and urban landscape of Lilongwe City will be degraded if the unplanned settlement occupying 40 % of the residential area of the City is uncontrolled against continuous sprawl. By the empowerment of management capacity of LCC concerning urban planning, land development control and building construction control, prevention of sprawl and upgrading of living environment of unplanned settlement are expected.

4) Recommendations for infrastructure and utility development and improvement are:

- Widening of major road network in the central area of the City should be urgently conducted to decongest worsening road traffic situation.
- Institutional improvement for solid waste management and sanitary management by LCC will be the preconditions or at least should be simultaneously achieved as physical inputs.

5) Lilongwe City is a especially rare and precious case as the natural sanctuary is preserved in its central area. By preserving the natural environment continuously in conjunction with active afforestation and park/green development, creation of attractive urban environment will be effectively achieved.

THE STUDY ON URBAN DEVELOPMENT MASTER PLAN FOR LILONGWE CITY IN THE REPUBLIC OF MALAWI

FINAL REPORT

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List of Abbreviations

AC	Asbestos Cement
ACGF	Africa Catalytic Growth Fund
ADL	Airport Development Limited
AfDB	African Development Bank
AGOA	African Growth and Opportunity Act
AL	Aerated Lagoon
AP	Anaerobic Ponds
AS	Activated Sludge
BCA	Blantyre City Assembly
BCR	Building Coverage Ratio
BOD	Biological Oxygen Demand
BOO	Build-Operate-Own
BOT	Build-Operate-Transfer
BRT	Bus Rapid Transit
CBD	Central Business District
CBO	Community Based Organization
CCODE	Centre for Community Organization and Development
CDS	City Development Strategy
CEAR	Central East African Railway Company
CEO	Chief Executive Officer
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	Chemical Oxygen Demand
CSB	Comptroller of Statutory Bodies
DANIDA	Danish International Development Assistance
DBSA	Development Bank of Southern Africa
DDI	Diaspora Direct Investment
DED	German Development Service
DFID	UK Department for International Development
DF/R	Draft Final Report
DNPW	Department of National Parks and Wildlife
DO	Dissolved Oxygen
DSI	Desludging Interval
EAD	Environmental Affairs Department
EDF	European Development Fund
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMA	Environment Management Act
ENRM	Environmental and Natural Resources Management
EPR	Expanded Producer Responsibility
EPZ	Export Processing Zones
ESCOM	Electricity Supply Commission
ESCOM	Electricity Supply Corporation of Malawi
ESP	Environmental Support Programme
EU	European Union

FAR	Floor Area Ratio
FDI	Foreign Direct Investment
FP	Facultative Ponds
F/R	Final Report
F/S	Feasibility Study
GDP	Gross Domestic Product
GIS	Geographic Information System
GNO	Greenery/ Natural Open Space
GoJ	Government of Japan
GoM	Government of Malawi
GWP	Global Warming Potential
HDPHA	High Density Permanent Housing Area
HDR	High Density Residential
HID	Heavy Industry
HRC	High-rise Commercial
HRR	High-rise Residential
IC/R	Inception Report
IDA	International Development Association
IEE	Initial Environmental Examination
IGPWP	Income Generating Public Works Programme
IMF	International Monetary Fund
ITC	Intermediate Technology Consultants Limited
IT/R	Interim Report
JICA	Japan International Cooperation Agency
JST	JICA Study Team
KIA	Kamuzu International Airport
LCC	Lilongwe City Council
LDA	Lilongwe District Assembly
LDPHA	Low Density Permanent Housing Area
LDR	Low Density Residential
LGA	Local Government Act
LID	Light Industry
LIDS	Lilongwe Integrated Development Strategy
LRT	Light Railway Transit
LUSTECH	Lilongwe University of Science and Technology
LWB	Lilongwe Water Board
MASAF	Malawi Social Action Fund
MDD	Maximum Day Demand
MDGs	Millennium Development Goals
MDPHA	Medium Density Permanent Housing Area
MDR	Medium Density Residential
MEGS	Malawi Economic Growth Strategy
MGDS	Malawi Growth and Development Strategy
MIPA	Malawi Investment Promotion Agency
MIS	Management Information System
MoIWD	Ministry of Irrigation and Water Development
MMDGs	Malawi Millennium Development Goals

MOAM	Minibus Owners Association of Malawi
MoF	Ministry of Finance
MoLGRD	Ministry of Local Government and Rural Development
MoLHUD	Ministry of Land, Housing, and Urban Development
MoNREE	Ministry of Natural Resources, Energy and Environment
MoTPI	Ministry of Transport and Public Infrastructure
MP	Maturation Ponds
MP	Master Plan
MPRS	Malawi Poverty Reduction Strategy
MPUWSP	Malawi Peri-Urban Water and Sanitation Project
MRA	Malawi Revenue Authority
NAPAs	National Adaptation Programmes of Action
NCII	National Construction Industry Institute
NEC	National Environmental Council
NGO	Non-Governmental Organization
NRSCM	National Road Safety Council of Malawi
NRW	Non Revenue Water
NTS	Nature Sanctuary
NTU	Nephelometric Turbidity Unit
NSO	National Statistic Office
NSSD	National Strategy for Sustainable Development
NWDP	National Water Development Project
OD	Origin and Destination
OJT	On-the-Job Training
O&M	Operation and Management
OPEC	Organization of the Petroleum Exporting Countries
ORP	Oxidation Reduction Potential
OSS	On-site Sanitation
OZS	Outline Zoning Scheme
PAPs	Project Affected Persons
PAR	Park and Recreation
PE	Poly Ethyl
PFI	Private Finance Initiative
PHD	Peak Hourly Demand
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public Private Partnership
PRGF	Poverty Reduction and Growth Facility
PRSP	Poverty Reduction Strategy Paper
PVC	Polyvinyl Chloride
QUR	Quasi-Residential
QVR	Quality Verification Report
RA	Roads Authority
RMI	Road Maintenance Initiative
ROW	Right of Way
RTD	Directorate of Road Traffic
SADC	South African Development Community
SC	Steering Committee

SCADA	Supervisory Control And Data Acquisition
SEA	Strategic Environmental Assessment
SG	Standards and Guideline
SMEs	Small and Medium Enterprises
SS	Suspended Solids
STP	Sewage Treatment Plant
SWAP	Sector-Wide Approach
SWM	Solid Waste Management
SWOT	Strengths, Weaknesses, Opportunities and Threats
TCPA	Town and Country Planning Act
THA	Traditional Housing Area
TLWSP	Third Lilongwe Water Supply Plan
TW	Treatment Works
UFW	Unaccounted for Water
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VIP	Ventilated Improved Pit
VOC	Vehicle Operating Cost
WB	World Bank
WFP	World Food Programme
WG	Working Group
WHO	World Health Organization
WQR&P	Water Quality Research and Pollution Division
WRB	Water Resources Board
WSP	Waste Stabilization Pond
WTP	Water Treatment Plan
WUAs	Water User Associations

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Introduction

In response to the official request of the Government of Malawi (GoM), the Government of Japan (GoJ) decided to conduct “the Study on Urban Development Master Plan for Lilongwe” in the Republic of Malawi (“the Study”) in accordance with the Agreement on Technical Cooperation between GoM and GoJ signed on 15th November 2008.

Accordingly, Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of GoJ, undertook the Study in close cooperation with the executing agency, the Ministry of Local Government and Rural Development (MoLGRD) and other authorities concerned under the GoM. The Lilongwe City Council (LCC) is the counterpart agency for the Study. LCC used to be called the Lilongwe City Assembly and officially changed its name to Lilongwe City Council in 2010.

1.2 Background

The GoM decided to relocate its capital from the city of Zomba to Lilongwe in 1965. Consequently, the capital was officially transferred to Lilongwe in 1975. The Lilongwe Master Plan developed in 1968 shows the basic principles of the urban planning for Lilongwe City (hereafter referred to as “the City” or “Lilongwe”). The Lilongwe Outline Zoning Scheme meanwhile, which followed suit in 1969, indicated the outlines of land use for this new capital. The said zoning scheme was reviewed in 1986 and the city’s jurisdiction area was expanded by including Area 56 and Area 57. Then, Area 58 was added to the jurisdiction of the City according to the 2008 Population and Housing Census although its inclusion is not yet legitimized. The 1986 Outline Zoning Scheme was intended to promote regulated urban development and appropriate land use for transport and other purposes. The Scheme was effective until 2000, but it was not updated after the year of 2000 due to financial, technical and human resources constraints.

The jurisdiction area of Lilongwe City, including Area 58, is 393 km² and has a population of approximately 674,000 according to the 2008 Population and Housing Census. Despite the fact that the existing outline zoning scheme was planned to develop the four sectors: (1) Old Town Sector, (2) Capital Hill Sector, (3) Kanengo Sector, and (4) Lumbadzi Sector, the urban area has been expanding to the southern, southwestern and western areas of the old town section of the city. Unplanned settlements occupied by illegal settlers expanded in almost all areas. Some areas have problems of illegal settlers occupying the land designated for industrial development and public use. It is therefore necessary to urgently identify and secure a sizeable land area for planned residential development.

In the meantime, the rapid increase in the number of vehicles causes traffic congestions on the National Road No. 1 particularly in Old Town area, which also serves as an international arterial road passing through the centre of the urban area. Hence, this causes merging of international and intra-city transportation, creating a traffic issue that needs to be addressed. Other traffic-related issues that need to be dealt with include improvement of public transport facilities, improvement of access to unpaved areas, and

widening of the main trunk roads.

A growing population of the City would trigger off necessity of urban utilities represented by urban water supply, sewerage/on-sanitation and solid waste management. Improvement of urban utilities' services will be essential for enhancement of urban environment in the City.

As previously mentioned, the zoning scheme for Lilongwe City reviewed in 1986, since its development, no longer responds to the reality and actual needs of the city. Therefore, it is urgently necessary to establish an integrated urban development master plan in order to promote planned land use and regulate urban facility development.

1.3 Objectives of the Study

The objectives of the Study are as follows:

- (1) To formulate land use plans of Lilongwe City
- (2) To formulate the sectoral plans on transport and urban utilities (i.e. water supply, sewerage and solid waste management)
- (3) To formulate a capacity development plan to ensure implementation of the outputs of the Study
- (4) To formulate an implementation and management plan, and
- (5) To carry out technical transfer to Malawian counterparts through the Study

1.4 Scope of the Study

In order to achieve the objectives mentioned above, the Study covered the following items:

1. Review and analysis of the current situation
 - 1.1 Review the existing outline zoning scheme and relevant plans
 - 1.2 Collect and review the necessary data and information (socio-economic situation, physical environment, population, land use, housing, urban utilities, community facilities, industries etc)
 - 1.3 Analyze the institutional capacity for the relevant organization in terms of human resources, institutional arrangement, organizational capabilities and regulations
 - 1.4 Analyze the urban development and planning constraints and challenges
2. Formulation of development vision and goals
3. Formulation of socio-economic framework in the 1st stage (present to 2015), 2nd stage (2016-2020), and 3rd stage (2021-2030)

4. Formulation of land use plan for each stage
5. Formulation of the following sectoral plans
 - 5.1 Urban transportation plan (road, public transportation, and transport safety)
 - 5.2 Urban utilities' plan (i.e. water supply, sewerage and solid waste management)
6. Environmental and social impact study
7. Capacity assessment and development
 - 7.1 Assess the gap between the required and existing capacities for implementation of the plan at the individual and institutional levels and regulations
 - 7.2 Formulate the capacity development
8. Formulation of development program including priority projects
9. Technical and knowledge transfer through the implementation of the Study

1.5 Framework of the Study

Year	2009			2010		
Month	6~9		10~12	1	2~3	4~9
Scope of Study	<div>Review and analysis of the current situation</div> <div>* Development Vision / Goals</div> <div>* Socio-economic framework</div>		<div>Formulation of Land Use Plan</div> <div>* Formulation of the Subject Plans</div> <div>* Environmental and Social Impact Study</div> <div>* Implementation & Management Plan</div>			
	Capacity Assessment and Development Plan					
Report	<div>●</div> <div>IC/R</div>	<div>●</div> <div>P/R</div>	<div>●</div> <div>IT/R</div>			<div>●</div> <div>DF/R</div> <div>●</div> <div>F/R</div>
St/C & Seminar	<div>▲</div> <div>St/C</div>	<div>▲</div> <div>St/C</div> <div>◆</div> <div>Seminar</div>	<div>▲</div> <div>St/C</div> <div>◆</div> <div>Seminar</div>		<div>◆</div> <div>Seminar</div>	<div>▲</div> <div>St/C</div>

Note: IC/R: Inception Report P/R: Progress Report IT/R: Interim Report DF/R: Draft Final Report F/R Final Report

Source: JICA Study Team

Figure 1.5.1 Implementation Schedule of the Study

The Study is largely divided into two parts. The first part encompasses i) review and analysis of the current situation, ii) development of vision/goals, and iii) review of socio-economic framework. The first seminar held on 20 October 2009 informed participants of the current issues on urban development and land use/urban transportation, including public transportation system/ water supply, sewerage and solid waste management. The second steering committee meeting held on 8 October 2009 approved the vision/goals and population framework presented in the Progress Report.

The second core part is encompassing i) land use plan for each stage, ii) formulation of sector plans in the areas of urban transportation and utilities, ii) environmental and

social impact study, iii) capacity assessment and development plan, and iv) implementation and management plan. The Study at the interim stage focused on the long-term land use plan (3rd stage) and a long list of sectoral plans at first. The third steering committee meeting was then held in December 2009 to discuss the interim results of the Study. The Study Team was urged by the committee to enhance coordination between the relevant stakeholders and the Study Team, for the formulation of future land use and sectoral plans. The core part of the Study was elaborated through further coordination, and such results were presented in the second seminar held in January 2010.

At the beginning of March 2010, the Study entered into the second part and held a third seminar where all components of the core part were presented. The Draft Final Report (DFR) was subsequently submitted to the relevant stakeholders at the end of March, 2010. During two months from April to May, 2010, the Study was at the stage of preparation for development programs based on sector plan comprising of urban transportation, urban utilities, capacity development and environmental projects.

The fourth steering committee meeting was held on 15 June 2010 and was the last session for obtaining official approval of the Study results. The development programs were principally discussed at the fourth steering committee. Then the Final Report was submitted to the relevant stakeholders in July 2010.

CHAPTER 2

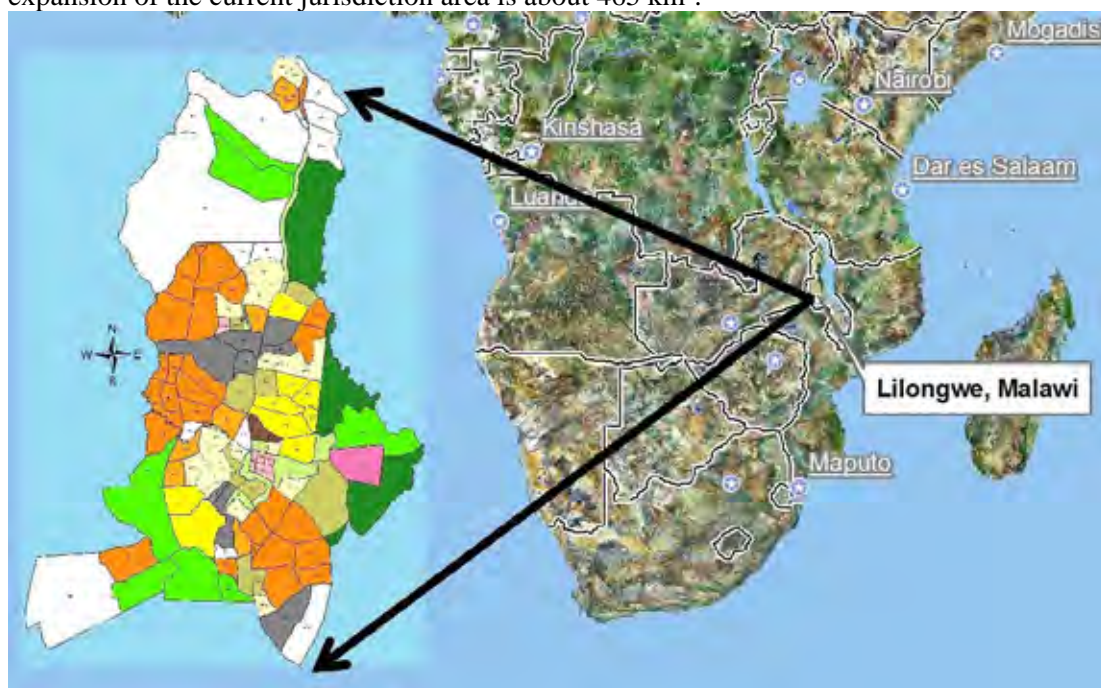
LILONGWE NOW: THE STATUS QUO

CHAPTER 2 LILONGWE NOW: THE STATUS QUO

2.1 The Study Area

2.1.1 Definition of the Study Area

The current jurisdiction area of Lilongwe City, including the adjoining Area 58, is 393 km² and has a population of approximately 674,000 according to the latest 2008 Population and Housing Census¹. Since the time frame of the Study covers the year up to 2030, the study area is defined as the land covering housing and infrastructural development in the long-term development phase. The study area encompassing future expansion of the current jurisdiction area is about 465 km².



Source: JICA Study Team

Figure 2.1.1 Map of the Study Area

2.1.2 Natural Conditions

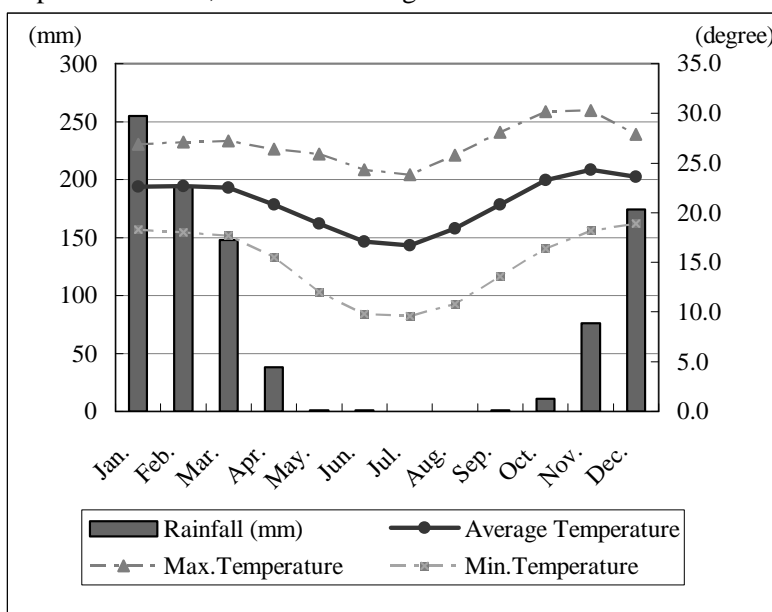
Lilongwe City (hereafter referred to as “the City” or “Lilongwe”) is in Lilongwe District in the central region of Malawi, located at latitude 13.59 South and longitude 33.47 East. The City has a surface area of 393 km² including Area 58, and shares the boundaries with the neighbouring Dowa District at the northern edge of the City, and Chitukula, Mtema, Njewa, Malili, Kalumba, Tsabango and Chimutu Areas in the Lilongwe District.

Its topography is mostly flat with an elevation ranging from 1,000 m to 1,200 m above sea level. The northern part of the City is relatively hilly with several small streams flowing southward. The southern part of the City, where Lilongwe River is running through to the north eastern direction, is rather flat.

¹ This data includes the land area and population of neighboring Area 58. The land area (393 km²) of the City including Area 58 is based on GIS survey conducted in the Study.

As for geology, the area mainly comprises metamorphic and plutonic rocks overlain by soil of weathered metamorphic and plutonic rocks and alluvium.

The climate in the City is characterized by two distinctive seasons: dry, cool season from April to October and hot and wet season from November to March. The average monthly rainfall, maximum, average and minimum temperature in the years from 1997 to 2006 are shown in Figure 2.1.2. The average temperature throughout the year over the same period is 21°C, while the average annual rainfall is 902 mm.



Source: Statistical Yearbook 2008

Figure 2.1.2 Average Monthly Rainfall and Temperature in Lilongwe (1997-2006)

Vegetation in the City is characterized by savanna grass land and forest. Due to sufficient rainfall during the rainy season and mild climate throughout the year, both sub-tropical and tropical plants can flourish.

The City includes approximately 180 ha of the Lilongwe Nature Sanctuary. Lingadzi River runs through the virgin bush of the sanctuary which is home to indigenous plants and wild animals such as crocodiles, hyenas and kingfishers. The sanctuary is run by the Department of National Parks and Wildlife. Its nature trails and environmental education program attract approximately 10,000 visitors per year.

2.1.3 Social Conditions

(1) Area and Population

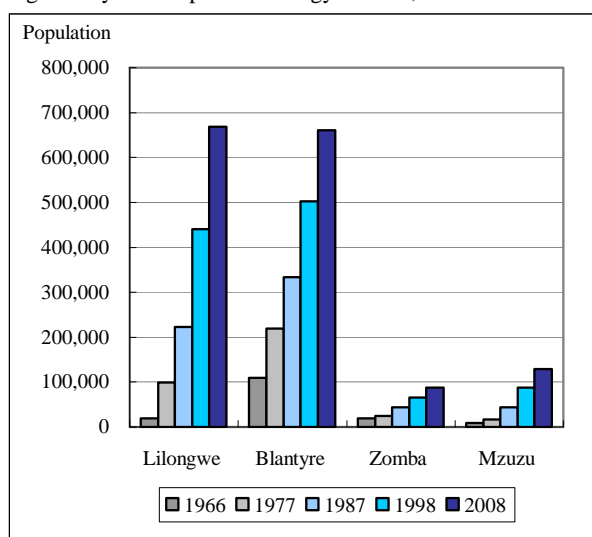
The City is one of the most urbanized and rapidly growing cities in Malawi. According to the 2008 Population and Housing Census, Lilongwe has a population of 674,448, which exceeds that of Blantyre City (661,256). As the population of the City was only 19,425 in 1966, this indicates that it has grown by more than 34 times in the last 40 years. Together with the population growth, the population density has also increased from 43 persons/km² in 1966 to 1,702 persons/km² in 2008. Tables 2.1.1 and 2.1.2 show the population densities and growth rates of the four major cities in Malawi on a historical basis.

Although population growth in the City is continuing, it is noted that the population growth rate is declining. Growth rate between 1998 and 2008 was 4.3 percent per annum while it was as high as 6.4 percent per annum in the preceding decade.

Table 2.1.1 Population, Land Area and Population Density of Major Cities in Malawi (1966-2008)

Land Area										
Lilongwe			Blantyre		Zomba		Mzuzu		Malawi Total	
393 km ²			220km ²		39km ²		48km ²		94,276km ²	
Population & Population Density										
	Lilongwe		Blantyre		Zomba		Mzuzu		Malawi Total	
	(person)	(per/km ²)	(person)	(per/km ²)	(person)	(per/km ²)	(person)	(per/km ²)	(person)	(per/km ²)
1966	19,425	49	109,461	498	19,666	504	8,940	177	4,039,583	43
1977	98,718	251	219,011	996	24,234	621	16,108	336	5,547,460	59
1987	223,318	568	333,120	1,514	43,250	1,109	44,217	921	7,988,507	85
1998	440,471	1,121	502,053	2,282	65,915	1,690	86,980	1,812	9,933,868	105
2008	674,448	1,702	661,444	3,007	87,366	2,240	128,432	2,676	13,066,320	139

Source: Lilongwe City Development Strategy Phase I, Statistical Yearbook 2008



Source: Lilongwe City Development Strategy Phase I

Figure 2.1.3 Population Growth of Major Cities in Malawi (1966-2008)

Table 2.1.2 Population Growth Rate of Major Cities in Malawi (1966-2008)

	1966-1977	1977-1987	1987-1998	1998-2008
Lilongwe	15.9%	8.5%	6.4%	4.3%
Blantyre	6.5%	4.3%	3.8%	2.8%
Zomba	1.9%	6.0%	3.9%	2.9%
Mzuzu	6.0%	10.0%	6.3%	4.0%

Source: Statistical Yearbook 2008

Table 2.1.3 shows the population distribution of persons aged 18 and over. It indicates that 52% of the population in Lilongwe is aged 18 and over, and this rate is slightly higher than the national average. In the meantime, looking at the sex ratio of all population and that of population aged 18 and over shown in Table 2.1.4, the sex ratios of population aged 18 and over in the four major cities are significantly higher than that of the national average (91.62). It implies that there is a flow of working age male population into the urban cities. Such ratios in the four cities range from 107 to 115 while that of Lilongwe City is 111.85.

Table 2.1.3 Population Distribution of Persons Aged 18 and Over (2008)

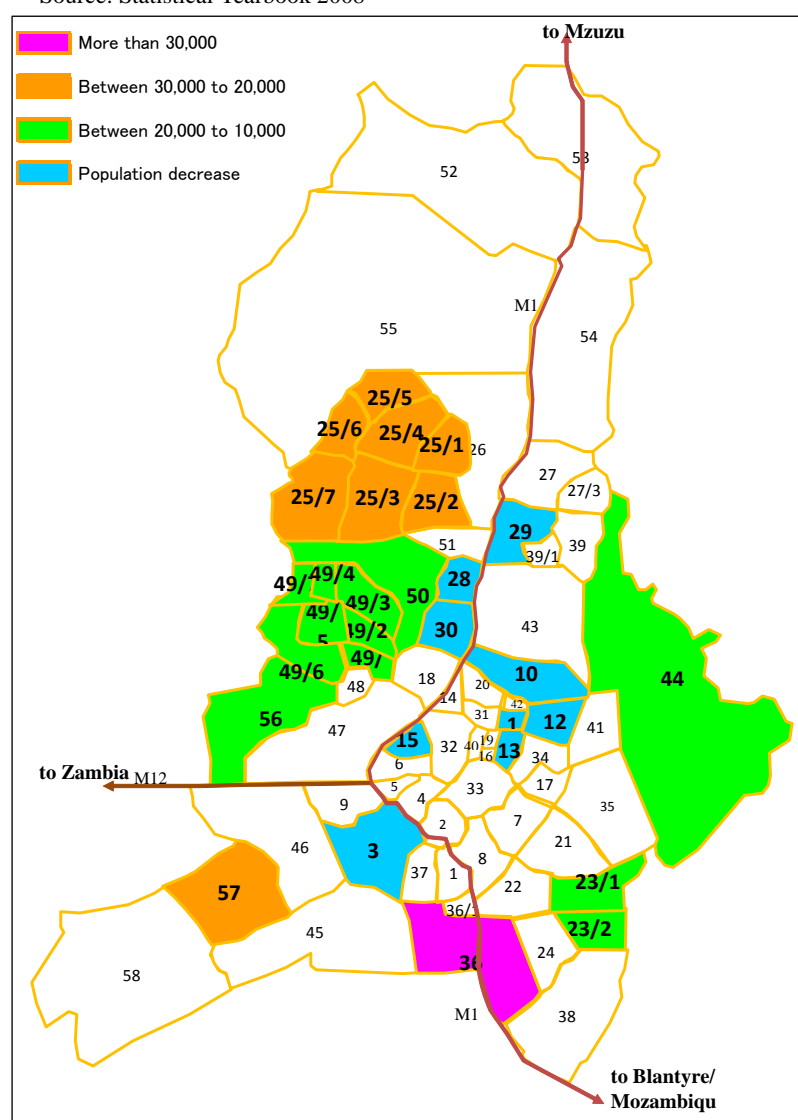
	Total Population	Population 18+	Percentage 18+
Malawi	13,066,320	6,216,432	48%
Lilongwe City	669,021	344,995	52%
Blantyre City	661,444	344,513	52%
Zomba Municipality	87,366	46,240	53%
Mzuzu City	128,432	66,665	52%

Source: Statistical Yearbook 2008

Table 2.1.4 Sex Ratios in All Population and Persons Aged 18 and Over (2008)

	All Population	Population 18+
Malawi	95.00	91.62
Lilongwe City	102.74	111.85
Blantyre City	104.28	111.62
Zomba Municipality	104.62	114.24
Mzuzu City	100.39	107.27

Source: Statistical Yearbook 2008



Source: Lilongwe City Assembly

Figure 2.1.4 Population Increase/Decrease during 1998-2008 by Area

Figure 2.1.4 shows the areas where the City's population decreased and increased by more than 10,000 during the ten years from 1998 to 2008. Urban sprawl is exceptional in the southern area (Area 36) where population increased by more than 30,000, followed by the southwest (Area 57) and the west (Area 25) with more than 20,000, and then, the southeast (Area 44). On the other hand, areas shaded blue indicate low density housing areas where population has decreased, resulting in sparse population density.

(2) Poverty Rate, Household Income and Expenditure

In terms of poverty rate, 8.8% of the City's population is categorized as poor and 24.6 % as ultra poor². Compared to the national average, where the poor and ultra poor population are identified as 22.4 % and 52.4 % of the population respectively, poverty rate in Lilongwe is significantly lower, as shown in Table 2.1.5.

Table 2.1.5 Percentage Distribution of Ultra Poor/ and Poor Population (2005)

	Ultra Poor (Less than MK 10,029/ person/ year)	Poor (Less than MK 16,165/ person/ year)
Malawi	22.4%	52.4%
Malawi Urban	7.5%	25.4%
Malawi Rural	24.3%	55.9%
Lilongwe City	8.8%	24.6%
Blantyre City	4.8%	23.6%
Zomba Municipality	11.6%	28.7%
Mzuzu City	10.6%	34.0%

Source: Integrated Household Survey 2004-2005

Average annual household income is relatively high in Lilongwe for all kinds of income sources compared to the average of urban areas in Malawi, as shown in Table 2.1.6. As shown in Table 2.1.7, household expenditure is also higher in Lilongwe than other areas of Malawi; mean and median annual household expenditure are MWK 233,118.0 and MWK 123,250.5, respectively. It indicates the high cost of living in Lilongwe in comparison to the annual household income of the residents.

As shown in Table 2.1.8, the highest share of household expenditure in Lilongwe is for food (42.9 %) followed by housing, utilities and furnishing (24.3 %), and transport, communication and recreation (18.2 %). Compared to other urbanized areas, Lilongwe is characterized by its high expenditure on transport, communication and recreation.

Table 2.1.6 Average Annual Household Income by Income Source (2005)

	Salaries/Wages (MK)	Agriculture (MK)	Enterprises (MK)	Other (MK)	Total (MK)
Malawi	18,331.2	19,680.6	29,769.9	4,848.4	50,904.4
Malawi Urban	73,274.4	17,544.5	65,888.1	23,255.3	129,407.3
Malawi Rural	10,867.8	19,970.7	23,924.0	2,789.2	40,240.8
Lilongwe City	95,048.9	19,453.3	84,047.0	23,601.8	162,331.2
Blantyre City	62,883.4	18,946.2	61,411.9	26,671.9	116,556.5
Zomba Municipality	46,815.8	4,253.7	29,017.6	17,338.3	71,711.5
Mzuzu City	31,485.9	11,426.6	45,757.4	9,408.0	66,480.8

Source: Integrated Household Survey 2004-2005

² The poverty line is a subsistence minimum set in Malawi Kwacha (MWK), based on the cost-of-basic-needs methodology. Individuals who belong to households with consumption lower than the poverty line fall under the category 'Poor'. Households with consumption lower than the national minimum food expenditure are identified as 'Ultra Poor'. Poverty line for 'Poor' is set at MWK 16,165 per capita per year, and MWK 10,029 for 'Ultra Poor'

Table 2.1.7 Mean and Median Annual Household Expenditure (2005)

	Mean (MK)	Median (MK)
Malawi	99,532.2	72,279.5
Malawi Urban	191,303.5	112,586.4
Malawi Rural	87,066.1	68,504.0
Lilongwe City	233,118.0	123,250.5
Blantyre City	160,605.9	105,018.9
Zomba Municipality	154,520.8	105,941.6
Mzuzu City	152,019.9	107,225.4

Source: Integrated Household Survey 2004-2005

Table 2.1.8 Percentage Distribution of Total Annual Expenditure by Type of Expenditure (2005)

	Food	Alcohol/ Tobacco	Clothing	Housing Utilities & Furnishing	Health	Education	Transport, Communication and Recreation	Misc. Goods & Services
Malawi	55.6	2.3	4.3	24.4	1.4	1.7	7.5	2.9
Malawi Urban	45.1	1.6	4.1	24.8	1.1	3.6	15.9	3.8
Malawi Rural	58.7	2.5	4.4	24.3	1.4	1.2	5.0	2.6
Lilongwe City	42.9	2.0	3.5	24.3	1.0	4.2	18.2	3.9
Blantyre City	47.4	1.2	4.7	25.6	1.2	2.8	13.5	3.5
Zomba Municipality	47.5	0.7	5.4	26.8	1.5	4.9	9.3	4.0
Mzuzu City	49.3	1.8	4.6	22.1	1.3	3.1	14.6	3.3

Source: Integrated Household Survey 2004-2005

2.1.4 Economic Condition

Malawian economy outside the four major cities is almost dominated by small holders-based agricultural activities (cash crop production). Meanwhile, urban economy in the major cities, particularly in Blantyre and Lilongwe, are dominated by economic activities in the secondary and tertiary sectors. Agriculture in Lilongwe is commercial farming consisting of poultry and cattle breeding businesses. Seasonal cropping observed in planned settlement areas is illegal agricultural activities.

The Welfare Monitoring Survey based on sampling survey implies that the tertiary sector is the largest industry (78%) in Lilongwe, followed by primary sector (13.0%) and secondary sector (9.0%), as shown in Table 2.1.9. The primary sector includes sample respondents who are engaged in seasonal agricultural (illegal) activities. High percentage of employment in the tertiary sector is attributed to lots of employed workers in retail/wholesale areas.

Table 2.1.9 Percentage Distribution of Currently Employed Persons (2007)

	Primary	Secondary	Tertiary
Malawi	77.0%	5.0%	18.0%
Malawi Urban	14.0%	10.0%	76.0%
Malawi Rural	84.0%	4.0%	12.0%
Lilongwe City	13.0%	9.0%	78.0%
Blantyre City	10.0%	11.0%	80.0%
Zomba Municipality	26.0%	13.0%	61.0%
Mzuzu City	27.0%	4.0%	69.0%

Source: Welfare Monitoring Survey 2007

Remarks: Although agriculture in planned area is not permitted in Lilongwe, many people in the city are engaged in agriculture either in their own premises or renting land outside of the city.

In Malawi, manufacturing is concentrated in the country's two major cities: Blantyre and Lilongwe. According to the Malawi Productivity & Investment Climate Survey (2004), firms in Blantyre specialize in relatively high/medium-technology and heavy industries, such as textiles, chemicals/chemical products, rubber/plastic products, metal products, and machinery equipment. These industries tend to be international market-oriented and export/import linkages are important for firms in these lines of business. In contrast, firms in Lilongwe produce relatively low-technology and domestic market-oriented goods, such as food/beverage, rubber/plastic products for home consumption, and furniture. They fall into the category of light industry. Manufacturing in Lilongwe is also attributed to four tobacco factories producing semi-processed tobacco leaves for export. Tobacco is the product of Lilongwe's largest foreign exchange earnings through export.

In order to promote export, the GoM introduced the Export Processing Zones (EPZ) Act in 1995. Under this act, the Ministry of Industry and Trade can declare any land or factory to belong to export processing zones when appropriate. According to the Ministry of Industry and Trade, there are 14 companies in Malawi under the EPZ scheme as of October 2008. Three companies are located in Lilongwe, where one is an agro-related industry (cut flower) and two are garment companies. Cut flower is one of the promising non-traditional export products. In total, 4,700 people are employed in these three companies as shown in Table 2.1.10.

Table 2.1.10 Companies under EPZ Scheme in Lilongwe

Name of Company	Investment Level (MK)	Employment	Products
Zikomo Flowers	100,000,000	200	Cut flower
Lilongwe Textiles	1,000,000,000	2,000	Garments
Lilongwe Textile Limited	175,000,000	2,500	Garments

Source: Companies under EPZ Program, Ministry of Industry and Trade

The tertiary sector (services) in Lilongwe is characterized by a big supermarket (Shoprite) and commercial mall supported by a growing demand for imported goods, the development of the banking sector, tourism-related industries (i.e. hotels and transportation), public transportation services (mini buses) and trucking industries. Among them, international delivery (trucking) services would be highlighted since Lilongwe is surrounded by potential agronomic areas where tobacco and cash crops (coffee, cotton and groundnuts) are produced, and is strategically located as a depot centre to redistribute products to the South African Development Community (SADC) regional markets.

2.2 Lilongwe Development Context

2.2.1 National Development Plans: Malawi Growth and Development Strategy (MGDS)

The Malawi Growth Development Strategy 2006/2007 – 2010/2011 is a policy framework for the national development of Malawi. The MGDS issued in 2005 aims to attain the Malawi Millennium Development Goals (MMDGs) and the Malawi Vision 2020.

(1) MGDS 2006/2007 – 2010/2011

The MGDS2006/2007-2010/2011 was designed to attain the Malawi Vision 2020 issued in 1998, and it was prepared based on the Malawi Economic Growth Strategy (MEGS)

issued in 2004. It was aimed to keep the following characteristics:

Table 2.2.1 Outline of MGDS

Purpose	
To serve as a single reference document for policy makers in the government, private sector, civil society organizations, donors and cooperating partners, and the general public on socio-economic growth and development priorities	
Philosophy	
Poverty reduction through sustainable economic growth and infrastructure development	
Indicator for 2011 (condition in 2005)	
Inflation rate: 5.0% (16.9%) GDP Growth: 6.0% (1.9%) Per capita Income: USD 450 (USD 160) Net Domestic Debt/GDP: <10% (21.5%)	
Prioritized Sector	Prioritized Theme
<ul style="list-style-type: none"> - Agriculture and Food Security - Irrigation and Water Development - Transport Infrastructure Development - Energy Generation and Supply - Integrated Rural Development - Prevention and Management of Nutrition Disorders, HIV and AIDS 	<ul style="list-style-type: none"> - Sustainable Economic Growth - Social Protection and Disaster Management - Social Development - Infrastructure Development - Improved Governance

Source: Malawi Growth and Development Strategy 2006 -2011 (Government of Malawi, 2006)

Remarks: The President announced in 2009 that priority areas for the MGDS will have nine priorities.

Lilongwe as the capital city must contribute to achieving the five thematic themes in terms of i) industrialization and commercial development for economic growth, ii) community development (particularly improvement of living environment in unplanned settlements) for social development, iii) infrastructural development in the areas of urban transportation and utilities, and iv) improvement of governance in the areas of urban management, land management and living environment.

(2) Major Policies and Strategies

Firstly, the GoM prepared the Malawi Vision 2020 in 1998 with the following statement:

“By the year 2020, Malawi, as a God-fearing nation, will be secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values, and being a technologically driven middle-income country.”

Following the vision, the government launched the MMDGs 2000 stating fundamental goals/policies/strategies for the period from 2000 to 2005. The successive Malawi Poverty Reduction Strategy (MPRS) in 2002, Malawi Economic Growth Strategy (MEGS) in 2004, Poverty Reduction and Growth Facility (PRGF) in 2004 and National Export Strategy in 2005 were prepared to attain the MMDGs 2000.

In 2005, the government prepared the second MMDGs. In 2006, the MGDS was prepared to attain the goals of the MMDGs in 2005 and Malawi Vision 2020 in 1998, reflecting findings from previous policies and strategies prepared during 2000 to 2005.

The linkage of policies and strategies discussed above is presented in Table 2.2.2.

Table 2.2.2 Flow and Linkage among Major Policies and Strategies

National Policies, Strategies		Year	Linkage, Content
Malawi Vision 2020		1998	National long-term development perspective
Malawi Millennium Development Goals (MMDGs)		2005	<ul style="list-style-type: none"> - Prepared to comprehensively reflect findings from 2000 to 2005 - Set eight goals
Malawi Growth and Development Strategy (MGDS) 2006/2007 – 2010/2011	Prepared to attain Malawi Vision 2020 and MMDGs 2005	2006	<ul style="list-style-type: none"> - Policy framework of national development of Malawi - Absorbed National Export Strategy
Malawi Millennium Development Goals (MMDGs)		2000	Fundamental goals for followed policies/strategies from 2000 to 2005
National Export Strategy	Prepared to attain MMDGs 2000	2005	<ul style="list-style-type: none"> - Prepared by private sector - Responds to the strategy of ‘coordination among public and private sectors’ in MEGS
Malawi Economic Growth Strategy (MEGS)		2004	Included the coordination among public and private sectors to reflect finding from MPRS
Poverty Reduction and Growth Facility (PRGF)		2004	<ul style="list-style-type: none"> - Supported by International Monetary Fund (IMF)
Malawi Poverty Reduction Strategy (MPRS)		2002	<ul style="list-style-type: none"> - Ended in 2004 - Insufficient in attaining economic growth rate of 6%/year - Did not respond to ‘housing and land policy’ issue - Did not clearly mention the role of private sector

Source: Malawi Growth and Development Strategy 2006 -2011 (Government of Malawi, 2006)

2.2.2 Outline Zoning Scheme (1986)

The Lilongwe Outline Zoning Scheme is a statutory land use plan for the City prepared in 1986, which is an updated version of Lilongwe Structure Plan in 1978.

A linear, multi-centred urban form for the City was adopted to avoid the congestion problems of a single centre city. In order to promote the form, the Lilongwe Structure Plan divided the City into four sectors: Old Town, Capital Hill, Kanengo, and Lumbadzi, each being self-contained and complete with own commercial centre. This principle was taken over to the Outline Zoning Scheme.

The Outline Zoning Scheme is characterized into three strategies:

- To make more efficient land use:
Layout for housing, industrial, commercial, and other areas will be designed to maximize use of land consistent with minimizing infrastructure and service costs per plot.
- To consolidate the urban form:

Vacant sites within a built-up area will be developed first before sites on the edge or elsewhere

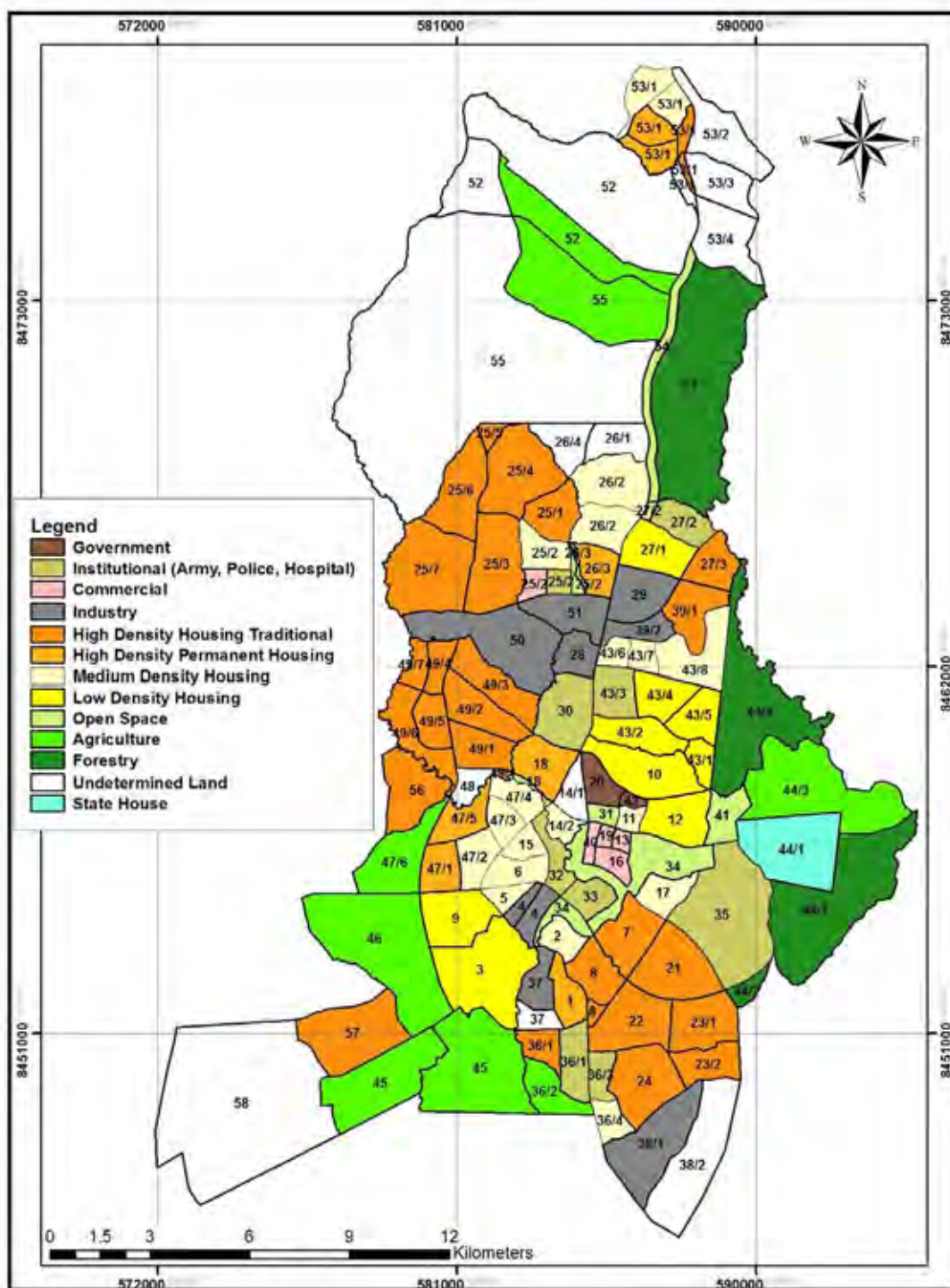
- To achieve a more balanced pattern of development:
It is to be ensured that each sector and neighborhood is self-contained with housing, employment opportunities, services, and facilities. Priority is to be given to developing the Capital Hill and the Kanengo sectors.

Land for housing was divided into two categories: permanent and traditional. Permanent land was further categorized based on density. Institutional land use included land for police, army, health, training, religious, sports, and other large establishments. Undetermined land was acquired to be used for unforeseen land use in the future.

Table 2.2.3 Outline Zoning Scheme in 1986

Land Use			Area (ha)	%
Housing	Permanent	Low Density	2,005	5.9 (17.1)
		Medium Density	1,855	5.5 (15.8)
		High Density	1,135	5.5 (9.7)
	Traditional	High Density Traditional	6,740	5.5 (57.4)
	Total		11,735	34.5 (100)
Commercial			295	0.9
Industry			2,050	6.0
Institutional			2,300	6.8
Agriculture, Forestry			7,990	23.5
Open Space			1,060	3.1
State House			560	1.6
Government Offices			155	0.5
Airport			1,340	3.9
Undermined Land			6,545	19.2
Total			34,030	100

Source: Lilongwe Outline Zone Scheme (Office of the President and Cabinet, 1986)



Source: Lilongwe City Assembly

Figure 2.2.1 The Outline Zoning Scheme (1986)

Although the outline zoning scheme containing 13 designated land uses was intended to guide and regulate the development of 34,000 hectares of the City, Lilongwe failed to implement the said scheme due to i) time-consuming planning application process, and ii) poor implementation capability of Lilongwe City Council (LCC). Absence of legal stakeholders responsible for planning application for the zoning scheme should be seriously taken into account as a significant lesson to LCC. Another lesson was highlighted in the areas of LCC's insufficient capability to control development. Consequently, there had been unprecedented increase in commercial and industrial development in the Old Town sector. This is clearly seen in the development of open spaces, car parking spaces, leisure parks and public land.

2.2.3 Plans and Programs Concerned with Lilongwe (CDS, District Plans, etc.)

(1) Lilongwe Integrated Development Strategy (LIDS)

The LIDS was prepared in 1990 and had been implemented with the support of the United Kingdom. Contrary to the Outline Zoning Scheme, which described only the land use plan as mentioned above, LIDS also explained the development strategy plan as a master plan.

However, LIDS was abolished in 2000 after its revision in 1998. Since then, the City has been governed without a plan.

(2) City Development Strategy (CDS)

A second draft of the CDS was issued in September 2009 under the support programme of Cities Alliance³ and finalized in November 2009. CDS was created to deal with the complex social and economic development challenges in the City. It was noted that master plans and structure plans prepared in the past no longer meet the latest situation in Lilongwe.

The thematic approach is applied to produce outcomes of the strategic plan. There are five themes as follows: governance, shelter and land, community development, service and the environment, and economic development. The final CDS presents a long list of programs to be implemented during 2010/2011-2014/2015 in the five themes.

The LCC is in a position to implement various programs recommended in the CDS, however it must take into account its capacity in terms of human resources, budgeting and institutional arrangement with other stakeholders for the implementation of programs. The past lessons gained during the implementation of the 1986 Outline Zoning Scheme should be recalled in order to avoid the lack of responsibility for the implementation of the CDS. As of June 2010, the Gates Foundation (its headquarter is located in Seattle of USA) was ready for funding improvement of living environment in unplanned settlement that was proposed by LCC.

³ Cities Alliance is a global coalition of cities and their development partners committed to scaling up successful approaches to poverty reduction. (<http://www.citiesalliance.org/ca/about-cities-alliance>)

CHAPTER 3

**DEVELOPMENT ISSUES
OF LILONGWE CITY**

CHAPTER 3 DEVELOPMENT ISSUES OF LILONGWE CITY

3.1 Urban Development Trend

3.1.1 Existing Land Use Pattern

(1) Current Land Use Survey Conducted for this Master Plan Study

So far, the Lilongwe City Council (LCC) has not produced any current land use maps to show the actual situation of land use at present. Current land use maps are essential tools, not only for future long term urban planning, but also for daily urban management works. From the planning point of view, the baseline situation (current land use) firstly needs to be understood. Otherwise, effective urban planning cannot be formulated. In this connection, JICA dispatched another study team to prepare a digital topographic map of Lilongwe City before the start of this master plan study. In addition, the JICA Study Team of the Master Plan has conducted detailed field survey throughout the city area and collected the detailed current land use data. Based on these works, the JICA Study Team has prepared the current land use map to cover the whole Lilongwe City using GIS technology. The map includes Area 58. The LCC is now examining whether Area 58 should be incorporated into the jurisdiction of LCC or not. At present, Area 58 belongs to Lilongwe District (rural). After authorizing the annexation of Area 58, the LCC's jurisdiction may be increased in the near future. The 2008 census has already included Area 58 as part of the population of Lilongwe City.

On the basis of the GIS data, the land area of Lilongwe City accounts for approximately 393 km² (39,345 ha).

(2) Existing Land Use

Lilongwe City is the capital of Malawi and the most rapidly growing city in Malawi in terms of population. In proportion to the population size, the jurisdiction of Lilongwe City is substantially large. The population of Lilongwe is almost the same as Blantyre while the land area of Lilongwe is almost twice larger than that of Blantyre. As a result, Lilongwe City still has abundant open spaces such as agricultural land, woodland and grassland. According to the compiled GIS data, the agricultural land use occupies more than a half (55%) of the city as shown in Table 3.1.1. It accounts for 21,646 ha. Majority of the agricultural land is seasonally used as arable land for agriculture. It is used for agriculture during the rainy season but unutilized in the dry season. Maize is predominantly the major crop.

Table 3.1.1 Existing Land Use of Lilongwe City, as of August 2009

	Landuse Categories	Area (ha)	%
1	Residential	9,316.64	23.7
2	Industrial	457.16	1.2
3	Commercial	339.42	0.9
4	Government	934.53	2.4
5	Institutional	876.53	2.2
6	Transport	559.37	1.4
7	Infrastructure & Utilities	96.76	0.2
8	Water bodies	2,749.11	7.0
9	Reserve & Green Areas	1,751.68	4.5
10	Leisure & Sport	152.06	0.4
11	Agriculture	21,646.19	55.0
12	Cemetary	313.04	0.8
13	Other Open Space	152.72	0.4
	Total	39,345.23	100.0

Source: JICA Study Team

The urban land use (built-up area: 1) residential; 2) commercial; 3) industrial; 4) government; 5) institutional; 6) transport; and 7) other infrastructure and utilities) occupies almost one third (32.0%). It accounts for 12,580 ha. Among them, the residential land use has the largest share. The residential land use occupies one fourth of the total land area (23.7%).

With reference to the breakdown of the residential land use in Table 3.1.2, it is regrettable that the unplanned settlements have already occupied the largest share (approx. 39.7%), followed by traditional housing area (THA) (18.9%), indigenous village (14.4%), low density permanent (13.9%), medium density permanent (9.1%) and high density permanent (3.7%).

Table 3.1.2 Breakdown of Residential Land Use, as of August 2009

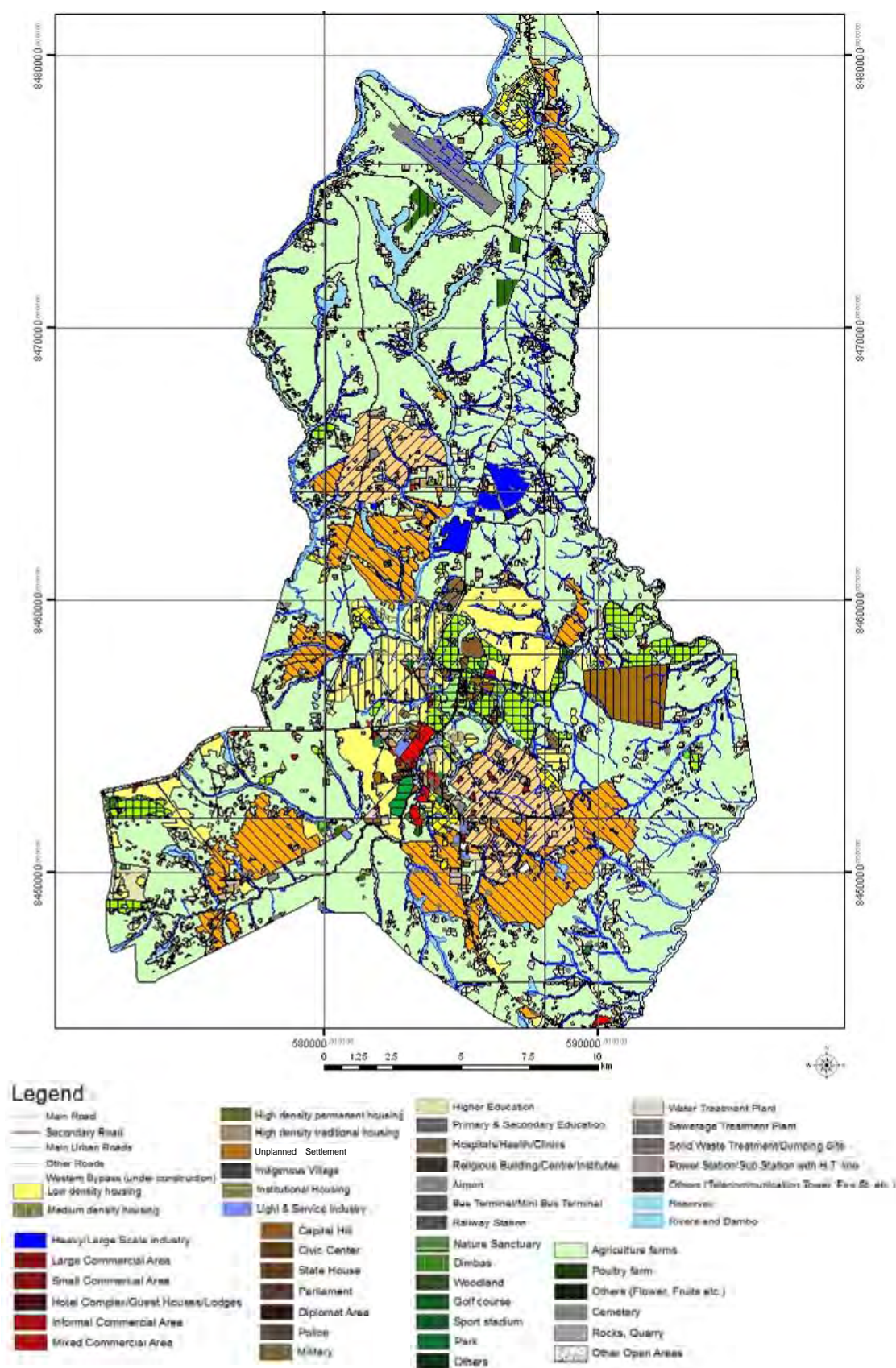
Language Categories	Sub Categories	Area (ha)	%
Residential	Low density housing	1,338.42	14.4
	Medium density housing	846.48	9.1
	High density permanent housing	346.26	3.7
	High density traditional housing	1,757.27	18.9
	Unplanned Settlements	3,700.47	39.7
	Indigenous Village	1,095.73	11.8
	Institutional Housing	232.01	2.5
	Total	9,316.64	100.0

Note 1: Unplanned settlements mean illegal housing area outside lawfully planned residential area.

Note 2: Indigenous villages are identified in any areas where rural tradition exists with rural housing and rural occupation. They are located outside the urbanized built-up areas.

Source: JICA Study Team

The current land use map of Lilongwe City is shown in Figure 3.1.1.



Source: JICA Study Team

Figure 3.1.1 Current Land Use Map of Lilongwe City, as of August, 2009

3.1.2 Urban Profile by Spatial Macro Zoning of Lilongwe City

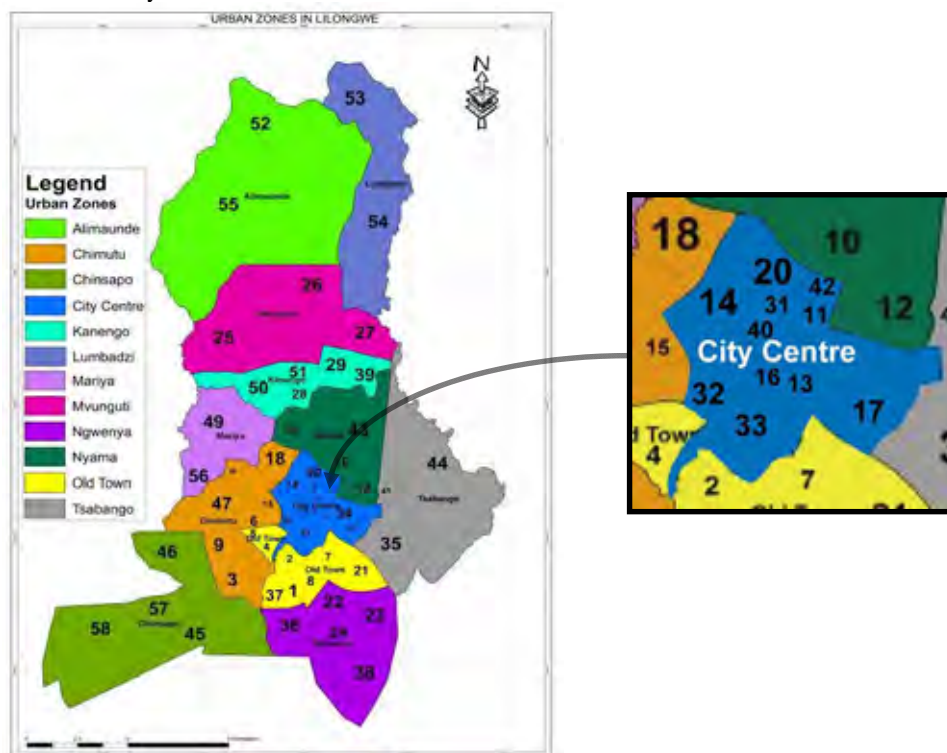
To highlight location-specific physical and economic characteristics in Lilongwe City, it shall be divided into several spatial macro zones. Spatial macro zoning is one of the working tools to organize urban information on a spatial image so as to enable the preparation of an urban development scenario that will have to accommodate different economic and spatial settings. Spatial macro zoning is also one of the layers to be integrated with the framework for urban structure to draw a development framework plan for Lilongwe City.

The following are the 12 spatial zones as shown in Table 3.1.3 and Figure 3.1.2:

Table 3.1.3 Spatial Macro Zoning to Highlight Physical and Economic Characteristics in Lilongwe City

Zone	Adv.	Area
Alimaunde	ALM	52, 55
Lumbadzi	LUM	53, 54
Mvunguti	MVN	25, 26, 27
Kanengo	KAN	28, 29, 39 50, 51
Mariya	MRY	49, 56
Chimutu Zone	CMT	3, 6, 9, 15, 18, 47, 48
Nyama Zone	NMY	10, 12, 30, 43
Tsabango Zone	TBN	35, 41, 44
City Centre Zone	CCT	11, 13, 14, 16, 17, 19, 20, 31, 32, 33, 34, 40, 42
Old Town Zone	OTN	1, 2, 4, 5, 7, 8, 21, 37
Chinsapo Zone	CSP	45, 46, 57, 58
Ngwenya Zone	NWY	22, 23, 24, 36, 38

Source: JICA Study Team



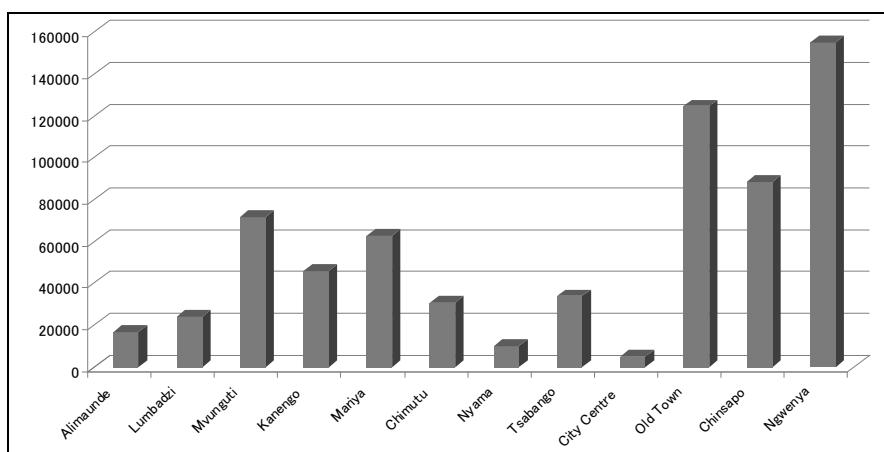
Source: JICA Study Team

Figure 3.1.2 Spatial Macro Zoning to Highlight Physical and Economic Characteristics in Lilongwe City

(1) Housing and Urban Expansion

From various sources and NSO (National Statistic Office) data, it can be pointed out that around 20% of houses had grass thatch and 55% were built of un-burnt bricks (NSO, 2007:53). In 2007, 58% of the houses were classified as permanent (NSO, 2005:84) and the remaining 42% were built of impermanent (traditional) materials. Whether the houses are made of traditional or permanent materials, most of them are built by the residents themselves and not by commercial builders. There are several institutional home builders/housing developers. They construct houses for sale or rent. But their share in terms of the overall housing supply in Lilongwe City seems to be very small. It can be frequently seen that there are construction sites wherein individual residents are constructing their houses by themselves. They do not contract out such construction works to institutional builders. Residents hire personal technicians and supervise the construction works. They usually do even the brick-burning on residential sites. People tend to produce bricks on their sites because it is much cheaper than buying manufactured bricks, whether they may be lower-income-class or even middle class. The government has begun to promote the use of manufactured bricks since individual brick-making on residential plots may cause environmental problems. Such self-building styles also raise an issue about the expansion of unplanned settlements.

Housing and urban expansion have been very active in the zones which surround the Old Town and the City Centre because of their proximity to job opportunities. Population has rapidly increased in the zones of Ngwenya (80.9%), Chinsapo (63.1%), Tsabango (83.5%) and Mariya (75%) from 1998 to 2008. Kanengo (66.9%), Mvunguti (61.3%), and Lumbadzi (55.3%) have also experienced very rapid population increase during the same period because of the convenience to commute to the Kanengo industrial belt areas and the airport from these zones.



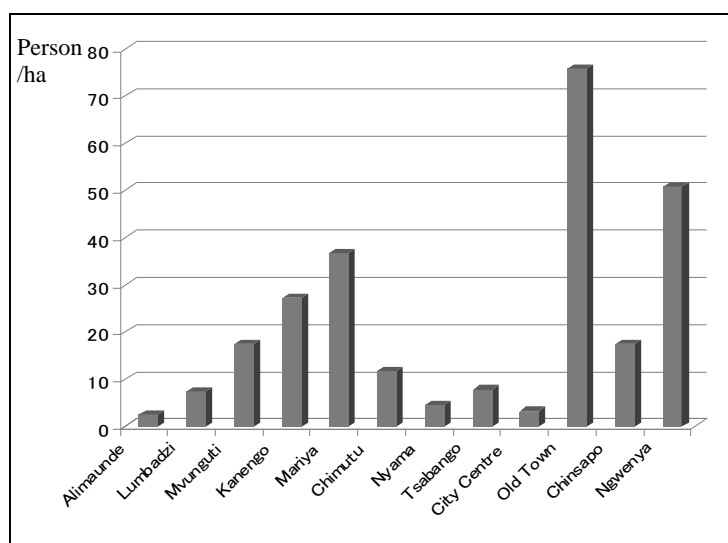
Source: JICA Study Team, using CENSUS data

Figure 3.1.3 Population by Zone, 2008

On the other hand, the population of Chimutu Zone and Nyama Zone decreased by 8.3% and 9.0% respectively. In general, these two zones have upmarket and luxurious residential areas with big mansions. Here, the population density is preserved at an extremely low level. Old colonial style atmosphere remains in these zones. In general, ordinary people cannot buy a house in such zones. Although the population is decreasing, it is conspicuous that new lodging buildings or semi-detached apartments have been increasingly constructed in recent years. Due to the temporary stays in such

lodging facilities, the night-time population in these zones has not decreased so much as the census shows.

In terms of population density as presented in Figure 3.1.4, the Old Town Zone is the densest area by far. It is 75.7 persons/ha. On the other hand, Chimutu Zone (11.6 persons/ha), Nyama Zone (4.4 persons/ha) and Tsabango Zone (7.8 persons/ha) are very sparse. With reference to the City Centre Zone, the living population (or night-time population) is very sparse while the working population at the workplace (or day-time population) is very dense.

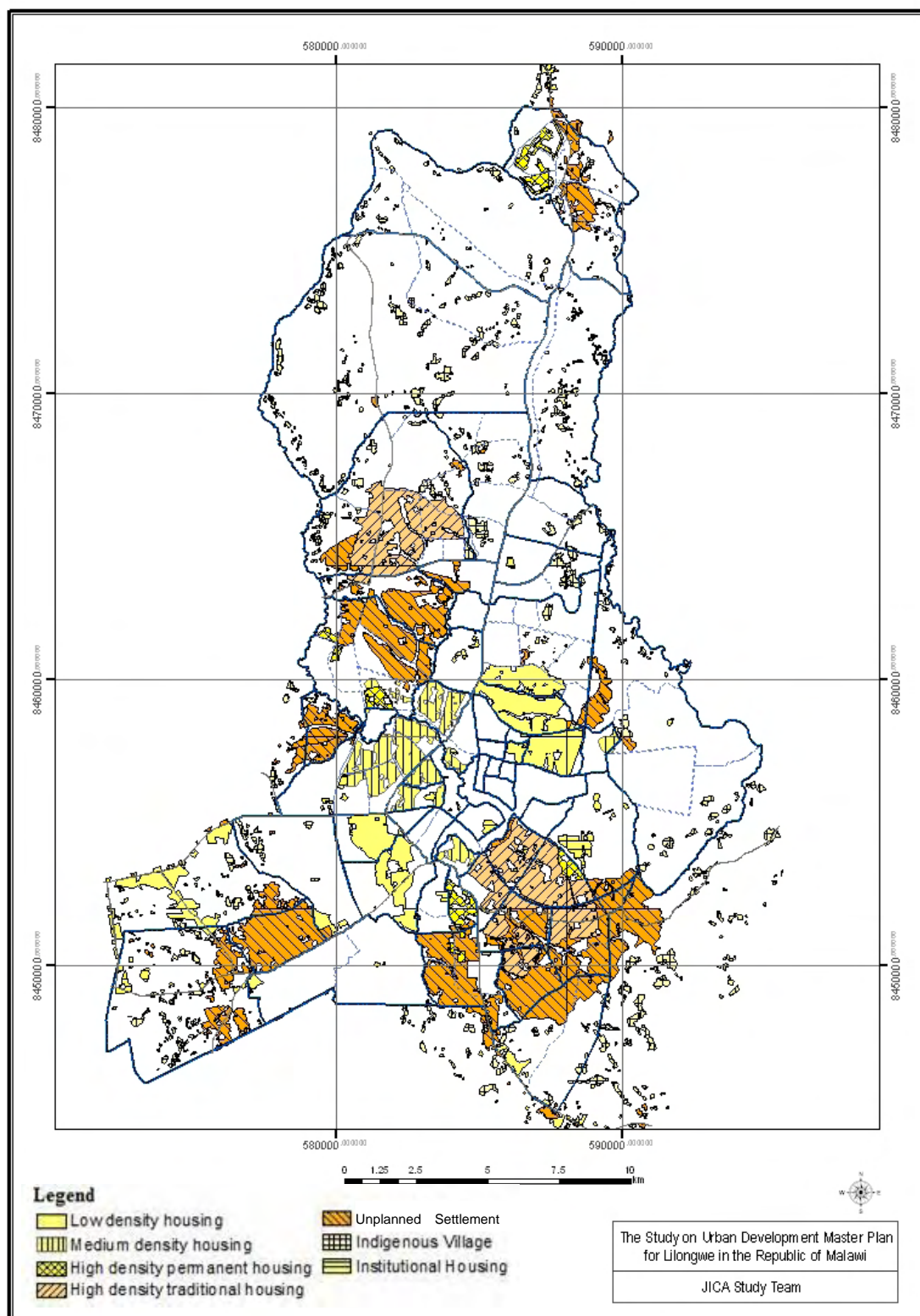


Source: JICA Study Team, using CENSUS data

Figure 3.1.4 Population Density by Zone, 2008

Lilongwe City has been growing in terms of horizontal rather than vertical development. It has been influenced by the British old colonial style settlement buildings. It has mostly one-storey houses and it is very rare to see multi-storied buildings, except in the City Centre and Old Town. Such extreme low density development principles do not have to be used for all the areas in the city. It is noteworthy to point out that the “compact land use concept” should be considered in view of the future urban development in Lilongwe City. It is necessary to pursue more efficient land use since the concept of a compact city is now widely accepted among physical planners in the world.

The current situation of residential land use in Lilongwe is presented in Figure 3.1.5.



Source: JICA Study Team

Figure 3.1.5 Current Situation of Residential Land Use

(2) Unplanned Settlements

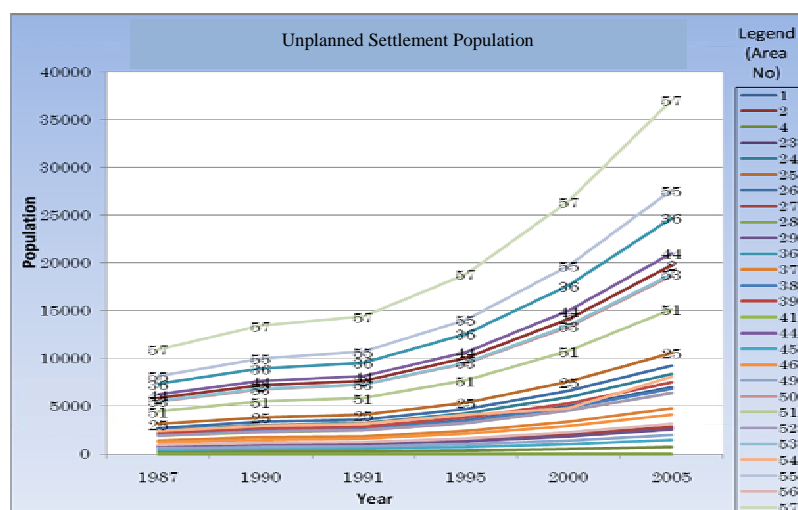
Based on the 2005 data in Table 3.1.4, the total population of unplanned settlements is 277,762. In terms of percentage, this means that approximately half (47%) of the population is living in unplanned settlements.

Table 3.1.4 Growth of Unplanned Settlement Population

Urban Zones	Abv.	1987	1990	1991	1995	2000	2005
Alimaunde	ALM	10,066	12,331	13,193	17,296	24,259	34,022
Lumbadzi	LUM	7,966	9,760	10,444	13,686	18,197	26,925
Mvunguti	MVN	6,726	8,239	8,816	11,557	16,209	22,732
Kanengo	KAN	12,990	15,913	17,028	22,319	31,302	43,904
Mariya	MRY	1,521	1,864	1,993	2,614	3,666	5,141
Chimutu	CMT	0	0	0	0	0	0
Nyama	NYM	0	0	0	0	0	0
Tsabango	TBN	8,105	9,929	10,623	13,926	19,532	27,395
City Centre	CCT	0	0	0	0	0	0
Old Town	OTN	9,569	11,722	12,542	16,441	23,060	32,342
Chinsapo	CSP	12,628	15,469	16,552	21,697	30,430	42,682
Ngwenya	NWY	12,609	15,447	16,528	21,665	30,386	42,619
Total		82,180	100,674	107,719	141,201	197,041	277,762

Source: Survey on the Unplanned Settlement, Lilongwe City Assembly, 2005

Analyzing the growth, the population living in unplanned settlements has been increasing very rapidly. It is worth noting that the speed of growth is much higher than the population growth. According to the survey of 2005, the unplanned settlement population of Lilongwe City has increased more than triple by 340% in a span of 17 years, i.e., from 82,180 in 1987 to 277,762 in 2005. This is equivalent to 7.4% increase per annum, which is higher than 4.3% per annum (population increase rate per annum in the city during 1998-2008). In particular, the population growth of the unplanned settlements has accelerated more from 1995 to 2005 than from 1987 to 1995 as shown in Figure 3.1.6.



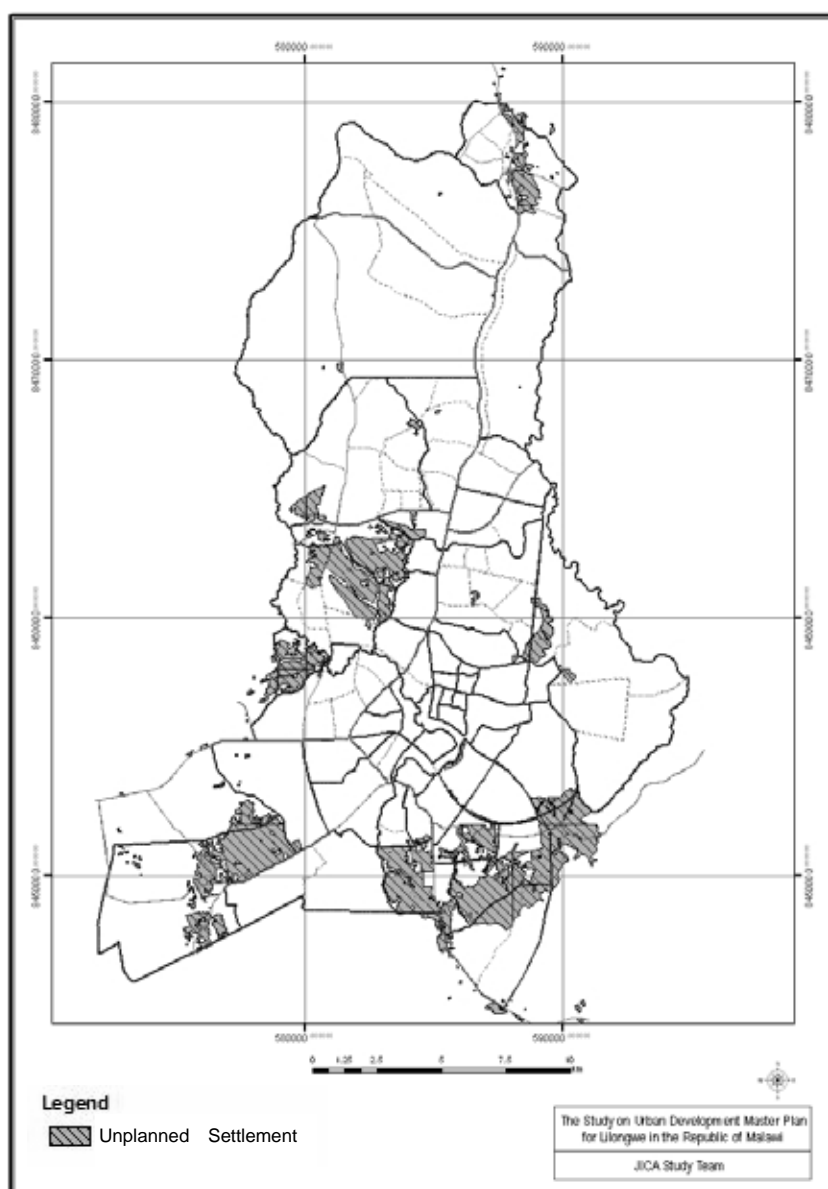
Source: JICA Study Team, with calculation from the data of the Survey on the Unplanned Settlement, Lilongwe City Assembly, 2005

Note: The unplanned settlement population of Area 55 as shown above (24,440) seems to be irrelevant compared with its current population of 13,545 (according to 2008 CENSUS). According to the survey of current land use conducted in July and August 2009, many indigenous villages exist but there are no unplanned settlements in Area 55.

Figure 3.1.6 Unplanned Settlements Population

Taking a look at unplanned settlements by zones as presented in Figure 3.1.7, very rampant expansion of unplanned settlements in the zones of Chinsapo, Ngwenya and Kanengo can be observed. The three zones have respective unplanned settlement population of 42,682, 42,619 and 43,904 in 2005. In the north, Alimaunde Zone has 34,022; Lumadzi, 26,925; and Mvunguti, 22,732. Although the State House exists in the Tsabango Zone, a sizeable unplanned settlement population exists here. It totals 27,395 in 2005. The Old Town also has a substantial number of unplanned settlement population of 32,342.

According to the survey, unplanned settlement population does not exist in Chimutu Zone, Nyama Zone and City Centre Zone.



Source: JICA Study Team Figure

Figure 3.1.7 Location of Unplanned Settlement Encroachment

(3) Commercial

The past urban plans, from the 1968 Master plan up to the 1986 Outlining Zoning Scheme, have so far advocated the concept of the multi-centred urban structure comprising of four sectors, namely: (1) Old Town Sector, (2) Capital Hill Sector, (3) Kanengo Sector, and (4) Lumbadzi Sector. Each sector was supposed to function independently with a view to avoid one-pole concentration and promote an even growth structure. It was envisioned by the past physical plans that each sector would be self-sustaining. However, such concept of self-sustaining within each sector did not materialize. Instead, Lilongwe City has been growing as one organic entity. Each sector does not function homogeneously. They are mutually depending on and helping each other. Commercial functions have a nature of pursuing scale merits and efficiency of concentration. One-pole concentration will be relevant and appropriate as an urban structure, rather than the multi-centred structure, as long as the city does not exceed a certain scale. A commercial centre function expects to seek economy of scale and concentration merit. Since, Lilongwe City, with its population, is not a megacity yet like London, Tokyo and New York, it is not necessarily appropriate for the urban administration to suppress the growth of the existing commercial centre by dispersing commercial centre function into several local centres. It is because attractive commercial centres must have scale merit. The dispersal policy will downgrade the attractiveness and decrease the efficiency of the market economy. In this connection, the Old Town will have strong demand for urban redevelopment and renewal in order to be more attractive and more efficient. The compact land use should be pursued and the urban infrastructure should be improved in the course of redevelopment and renewal.

In addition to such big commercial agglomeration, several shopping malls have been recently developed and located independently in the residential areas or around the traffic centres. Some are upmarket-oriented while others are standard market-oriented.

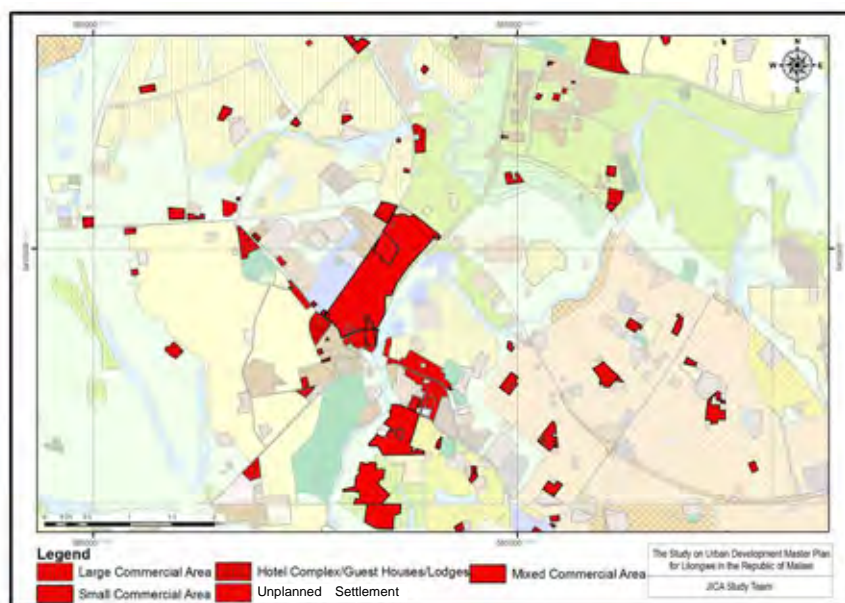
As the government functions are concentrated in the City Centre Zone, a lot of support function office and shops are also located adjacent to this zone.

A local centre is just like a neighbourhood commercial centre. One local centre is located in one area.

Some of the roadside of major roads are encroached by informal shops. Typically, a lot of small shops are located along the Kamuzu Procession Road in Area 36 and Area 38.

A commercial development project is currently prepared under PPP (public-private-partnership). The project site is near the airport in Alimaunde Zone (Area 52). This commercial development is assumed to include the construction of some hotels, shopping malls and an eco-tourism centre.

Figure 3.1.8 shows the location of commercial land use in the central part of Lilongwe City.

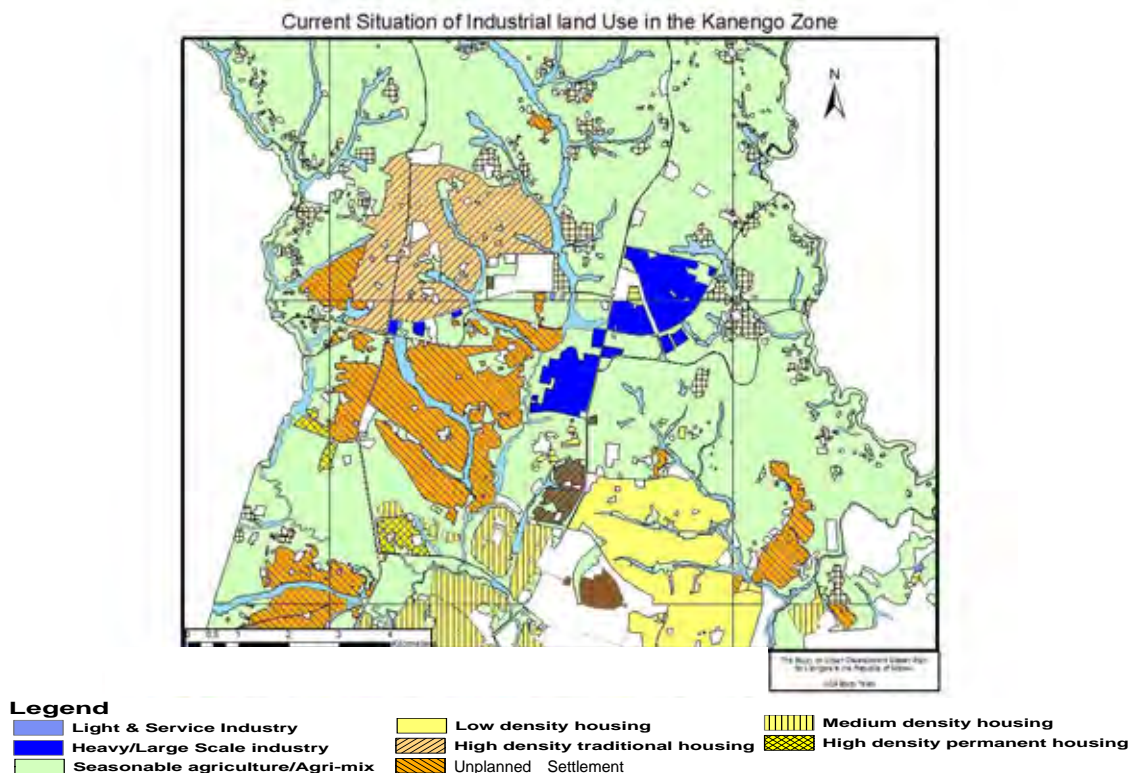


Source: JICA Study Team

Figure 3.1.8 Location of Commercial Land Use in the Central Part of Lilongwe City

(4) Industrial

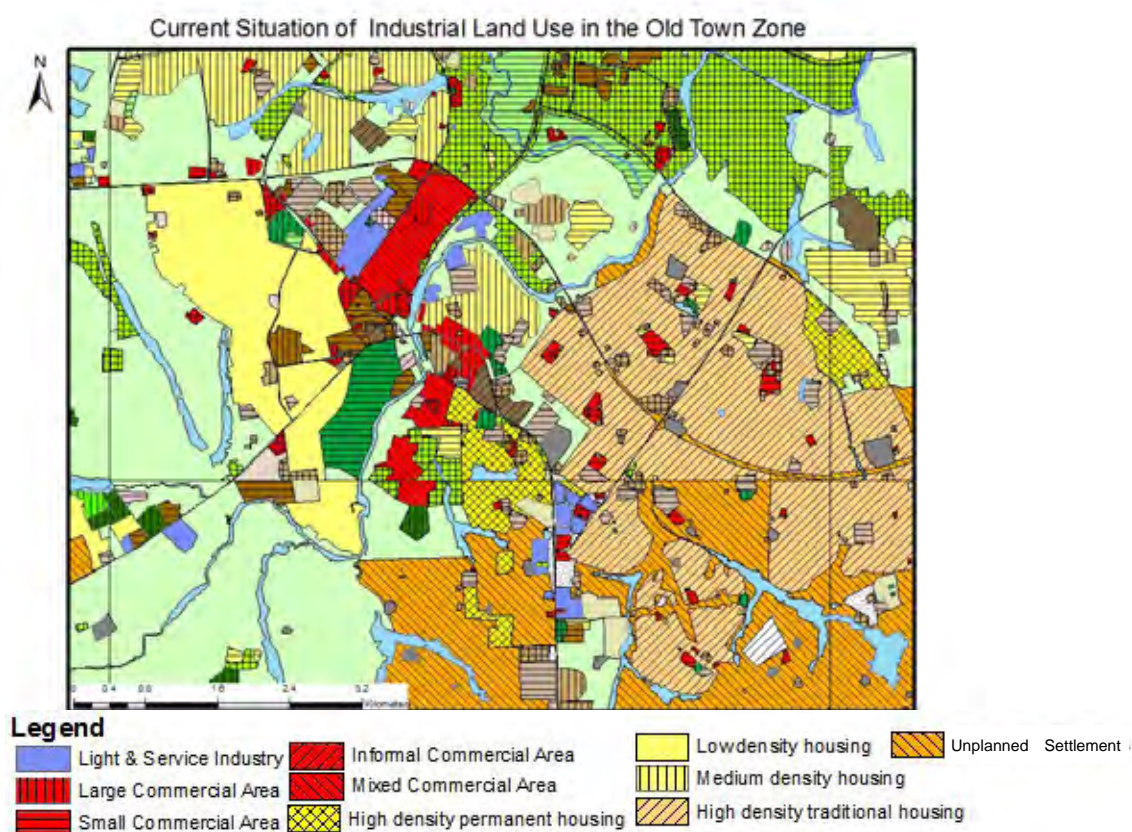
Kanengo Industrial Zone has been appointed as a major industrial location in Lilongwe City under the Outlining Zoning Scheme as shown in Figure 3.1.9. It has accommodated big capital-intensive industries such as tobacco processing. It is still expected to accommodate new industrial factories.



Source: JICA Study Team

Figure 3.1.9 Location of Heavy Industries/ Capital Intensive Industries in Kanengo Zone

In addition to Kanengo, the Old Town Zone is another industrial location. The Old Town is not only a commercial centre but also a mixed use area of commerce, industries, and residence. It has various kinds of activities and is a centre of business information. As shown in Figure 3.1.10, many small light-industrial workshops are concentrated in the central part of the city, particularly the Old Town. Typical industries are wood processing and furniture manufacturing, food processing, durable goods manufacturing and related warehouses. In view of improving the urban environment as well as offering employment opportunities for the area adjacent to the living place, these workshops, warehouses and small factories should better be relocated from the central part of the city.



Source: JICA Study Team

Figure 3.1.10 Location of Light Industries in the Old Town Zone

The industrial sector generates fundamental employment opportunities as well as new additional employment through the development of related services to support the industrial activities. Therefore, the industrial location significantly affects the spatial distribution of employment opportunities and consequently the structure of urban development. To realize a more balanced structure, industrial investment and factory establishments should be attracted and promoted not only in the Kanengo Area but also in several other parts. The Chinsapo Zone and Ngwenya Zone in the southern part are conveniently and advantageously located, being near the Old Town and living places of the working class population.

To ensure viability and competitiveness, each centre should be peculiar and specialized in certain sub-sector industries. This will also realize the overall diversification of the industrial sector of Lilongwe City. Such specialization may include airport-oriented

(high value), market-oriented (consumer goods, food processing) and technology-intensive industries. Small-scale industrial workshops prefer to locate adjacent to the city centre.

The following places may be considered as future industrial centres in Lilongwe City:

Kanengo Industrial Zone (Capital-intensive, export-oriented, (tobacco, textile, apparel)

Alimaunde Industrial Zone (Airport-related, high-value goods)

Ngwenya Industrial Zone (Urban-based industrial workshops, durable consumer goods and food processing)

Chinsapo Industrial Zone (Urban-based industrial workshops, durable consumer goods and food processing)

The dispersal strategy should be taken in view of improving the commuting efficiency since the working class do not usually use vehicle. It is very common to commute by walking in Lilongwe. In addition, the achievement of a more balanced structure should be pursued. In this connection, the location of industrial development should be diversified and it should reflect the characteristics of each industrial centres. For instance, industrialization can be for airport-related high value goods, export-oriented, local (urban) market-oriented, and technology-oriented.

(5) Agriculture and Forestry

Since the beginning of the construction of Lilongwe City, the main concern has been how to promote the growth of the capital city. Priority has been directed to urban land use rather than agriculture/forestry. Accordingly, the Outlining Zoning Scheme has been regulating the land use more for urban activity (residential, commercial, industrial, institutional, etc.) rather than for agriculture and forestry. Taking a look at the map of the Outlining Zoning Scheme (see Table 2.2.3), most are occupied by urban land use. The greenery land use has very minor share. The agriculture and forestry areas are mostly located in the fringe part of the City, namely, Chinsapo Zone and Tsabango Zone in the southern part, as well as Alimaunde Zone and Lumbadzi Zone.

Table 3.1.5 Land Use of Agriculture and Greenery in Lilongwe City

Landuse Categories	Area (ha)	%
Poultry farm/Dairy farm	196	0.5
Horticulture (Flower, Fruits etc.)	29	0.1
Seasonable agriculture/Agri-mix	21,421	54.4
Sub-Total (Agriculture)	21,646	55.0
Nature Sanctuary	114	0.3
Dimbas	13	0.0
Woodland	1,625	4.1
Sub-Total (Greenery)	1,752	4.5
Total (Agriculture and Greenery)	23,398	59.5
Grand-Total (Whole Lilongwe City)	39,345	100.0

Source: JICA Study Team

Looking at the actual land use situation, however, agricultural land use is still predominant now contrary to the pro-urban land use policy/regulation. As aforementioned, more than half (55%) is still occupied by agricultural land use, particularly seasonal agriculture. Seasonal agricultural activities outside the agricultural use under the 1986 Outline Zoning Scheme are interpreted as illegal. Open space occupies two third (68%) of the total land area. Lilongwe City has been still been keeping abundant greenery and a countryside atmosphere. Along the Lilongwe River, a

nature sanctuary exists and it has been kept intact in the very central part of the City. Thanks to the existence of the nature sanctuary, the urbanized areas of the City Centre, Nyama, Tsabango and Old Town have not been amalgamated as one urban conurbation area.

Table 3.1.6 Land Use of Open Space

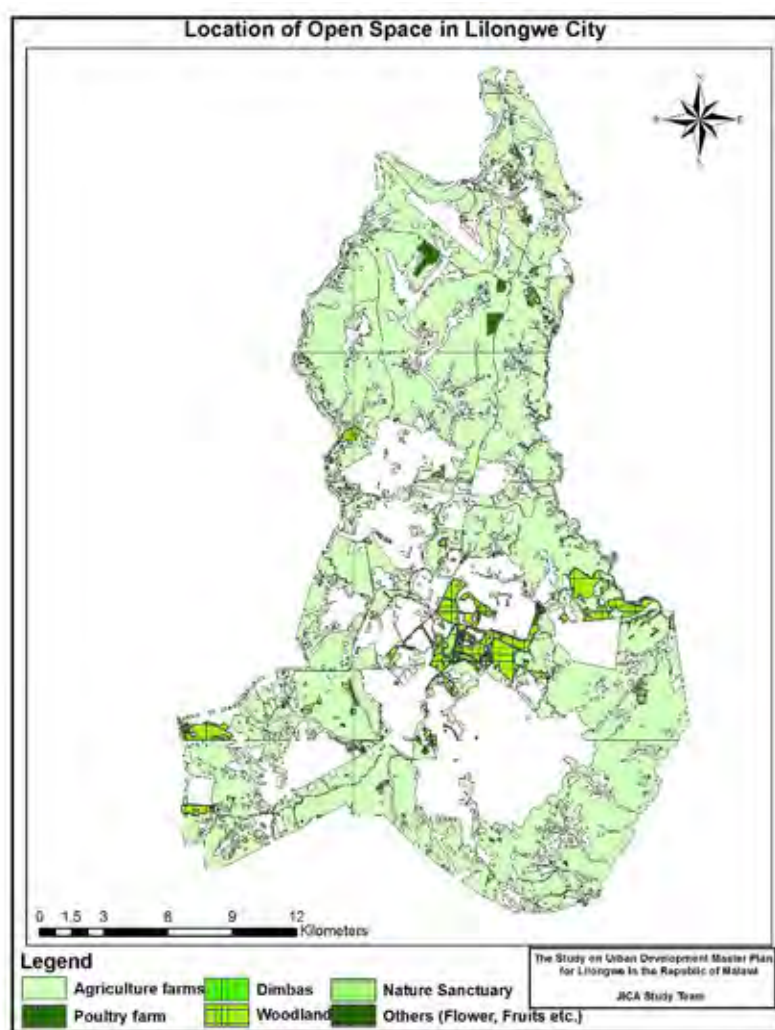
	Landuse Categories	Area (ha)	%
1	Water bodies	2,749.11	10.3
2	Reserve & Green Areas	1,751.68	6.5
3	Leisure & Sport	152.06	0.6
4	Agriculture	21,646.19	80.9
5	Cemetary	313.04	1.2
6	Other Open Space	152.72	0.6
	Sub-Total (Open Space)	26,764.80	100.0
	Total (Whole City)	39,345.23	

	Landuse Categories	Area (ha)	%
	Open Space	26,764.80	68.0
	Total (whole city)	39,345.23	100.0

Source: JICA Study Team

Since the population increase and urban sprawl are very rapid in Lilongwe City, there will be a future risk of losing abundant green and degrading the urban environment. It is deemed essential to keep in mind the importance of preserving nature, forestry as well as agriculture within the City. In this context, it is also important to pursue the compact land use policy by strengthening land use density particularly in the centrally located zones.

Taking a look at residential areas in Lilongwe City, backyards used for household farming can be found in many residential plots. For the urban poor, it is a sort of subsistence activity or economic survival strategy. Many people undertake various income-generating activities to earn income and ensure food security. This sort of home-based urban agriculture is widespread among urban dwellers in Lilongwe City, irrespective of economic status or employment seniority in government and private sectors.



Source: JICA Study Team

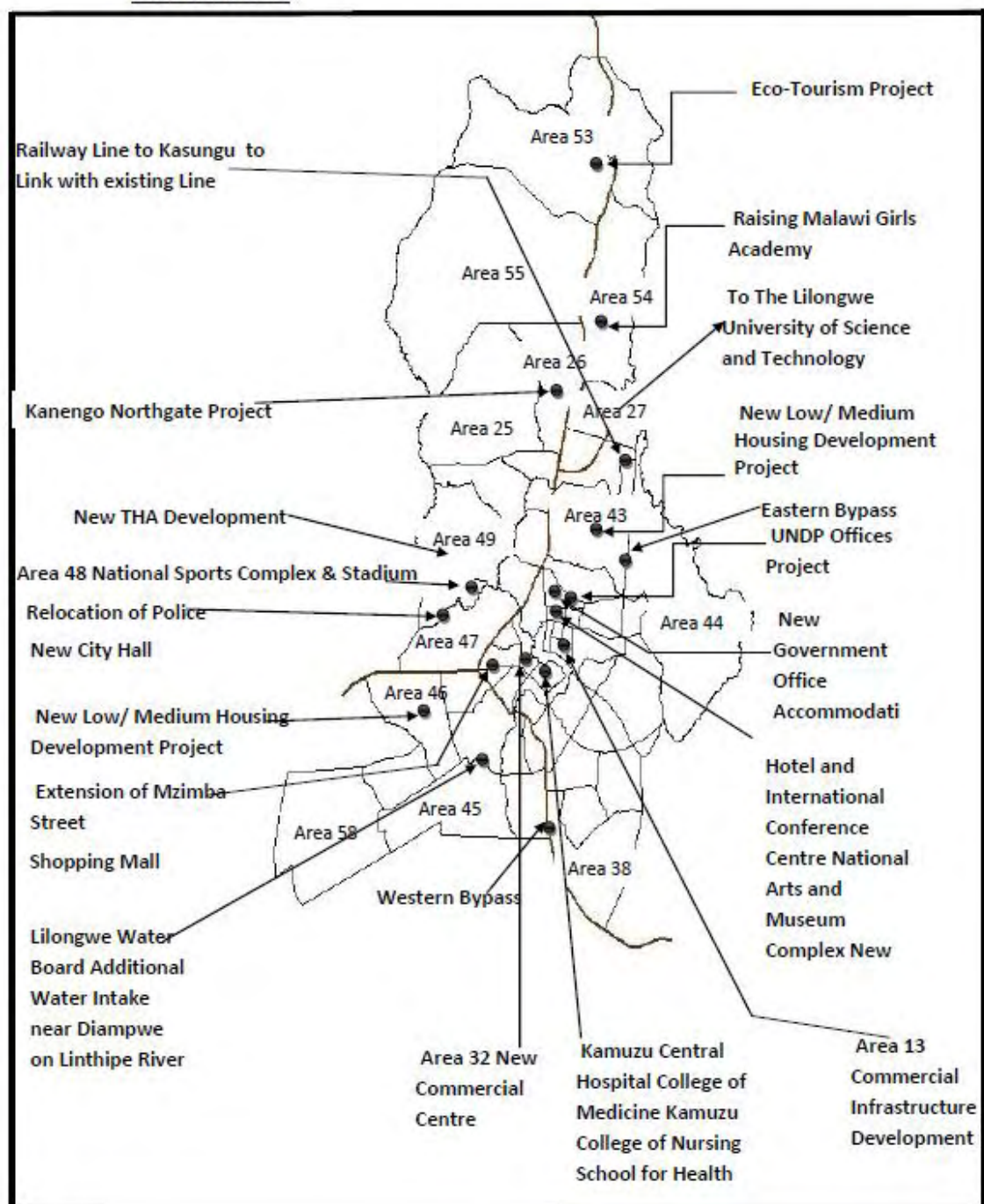
Figure 3.1.11 Location of Open Spaces in Lilongwe City

3.1.3 Major Urban Development Projects in Lilongwe City

Most of the urban development projects in the City are private sector-driven except for infrastructure projects provided by public institutions, and sponsored either by the central or local government. The planning of government programs is funded through capital budget from the government's own resources or donors. As private sector development programs can only be realized upon submission for planning approval, the information on these projects is not so comprehensive.

A list of major projects which are already proposed or planned is shown in Figure 3.1.12. These projects will provide the bases to foresee the future urban structure as well as the possible intervention in the master plan. Some of the projects are still at the start of planning/study and as such, the budget and timeframe have not been designed yet.

LILONGWE CITY MAJOR URBAN DEVELOPMENT PROJECTS



Source: JICA Study Team

Figure 3.1.12 Location of Major Urban Development Projects

3.2 Transportation

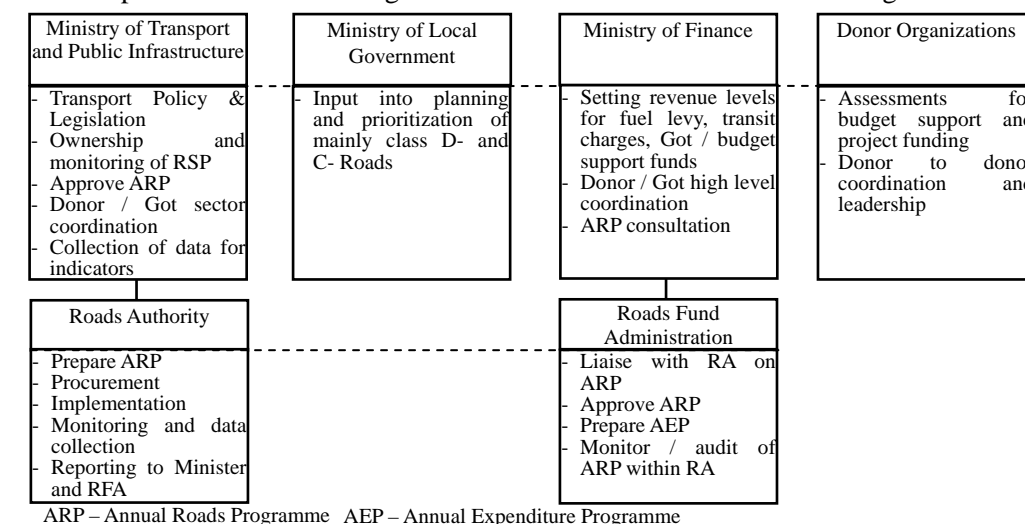
3.2.1 Overview of Transportation Sector

(1) Related Agencies for Transportation Sector

The Ministry of Transport and Public Infrastructure is composed of several departments, namely: Road Traffic, Public Works, Civil Aviation, Marine and Meteorological Services.

The mandates of the Directorate (Department) of Road Traffic are to provide the legal framework for the road transport industry, to administer regulatory provisions governing motor vehicle administration, driver licensing administration, and operator authorization, and to permit control and other issues related to traffic management control.

The transport sector's related organizations and their roles are shown in Figure 3.2.1.



ARP – Annual Roads Programme AEP – Annual Expenditure Programme

Source: Roads Sector Programme, April 2007

Figure 3.2.1 Major Organizations Related to the Transport Sector

(2) Road Sector Reform

Prior to 1998, road construction and maintenance were under the Ministry of Works and Supplies (presently the Ministry of Transport and Public Infrastructure). The budget allocation to the road sector was very limited. As a result, road development, and operation and maintenance were very poor. Road facilities deteriorated considerably during the early 1990s and the road sector was virtually unsustainable in terms of managing road facilities.

This led to the road sector reform, which was initiated by the Road Maintenance Initiative (RMI) Studies in 1995, with financial assistance from the European Union.

The GoM successfully established an autonomous Roads Authority in 1998, and decided to use fuel levies as revenue for said agency.

Further reforms in 2006 resulted in the separation of the Roads Authority and Roads

Fund Administration. The two boards started operating on January 1, 2007. The establishment of the Road Traffic Authority, which will integrate the traffic police and the Department of Road Traffic, is another reform that has not been launched yet. Meanwhile, the National Road Safety Council of Malawi, which is responsible for the promotion of road safety, remains unchanged.

(3) Overview of the Transportation Condition in Malawi

1) General Condition of Transportation

Malawi's transport system currently includes 15,451 km roads, 810 km railways, four major lake harbours, and three major airports and a national carrier.

Malawi has an agro-based economy and relies on the road transport system especially in rural areas, where more than 85% of the population lives. Both main roads and railways are the major means of transportation.

According to the Road Sector Program (Ministry of Transportation and Public Infrastructure, 2007), road transport currently handles more than 70% of the domestic freight traffic and 99% of the passenger traffic. Additionally, road transport handles more than 90% of the international freight and passenger traffic.

According to the Malawi Growth Development Strategy (MGDS), transportation cost shares 55% of the production costs in Malawi while the equivalent share is averagely around 14% in Africa and 8.6% in all developing countries. The high transportation cost is due to long road distances from ports, import tax for truck vehicles, and inefficient cargo consignment such as empty returning cargo.

2) Railway, Freight and Air Transports

Railway Transport

Malawi has a total of 797 km single-track (1067 mm gauge) railway within the country's borders, out of which, 757 km is operational. The rail network serves the southern half of the country. It starts from the Mozambique border, branching to the Sena line in Mozambique in the south, through Blantyre up to the port of Chipoka, and the town of Salima near the lake. From there, the line runs west through Lilongwe to Mchinji and the Zambian border (The line was extended from Salima to Lilongwe in 1977 and was later extended to Mchinji on the Zambian border). In Nkaya, midway between Blantyre and Salima, a branch goes east to the Mozambican border (Nayuchi/Entre Lagos) to reach the Nacala line in Cuamba.

At Chipoka, 32 km south of Salima, the railway connects with the Lake Malawi steamer service, operated by the Malawi Lake Services. The railway line extends to the south, from Nsanje to the port of Beira in Mozambique. The Central East African Railway Company (CEAR), a private railway company in Malawi (a concessionaire of the former Malawi Railways), operates the 26-km span from Nsanje to the Mozambique border.

The railroad condition in Malawi appears to be unstable:

- The line (225 km) between Salima and the Zambian border is under construction or being rebuilt recently through a Canadian grant.

- The line between Blantyre and Salima as well as the branch from Nkaya to the Mozambican border are generally in good condition although they need some re-ballasting and repair.
- A washed-out bridge in the south of Salima in 2003 prevents operations to Salima and Lilongwe. The bridge was repaired under a DFID grant, and the Salima – Lilongwe section is now operational. However, there are intermittent interruptions on the line due to high deterioration and vandalism of rail infrastructure.
- The tracks in the southern part of Blantyre (a 209 km section) are in poor condition. The most southern section, 80 km south of Makhanga, is no longer in use and needs rehabilitation as some sections have been washed away by floods.



Source: Technical Assistance to Railway Sector
Department, Draft Report, April 2009

Figure 3.2.2 Railway Network of Nacala Corridor

CEAR has two responsibilities:

- Operate on a commercial basis the Malawian part of the cargo traffic from/to Blantyre or Lilongwe and to the port of Nacala in Mozambique. CEAR pays concession fees of USD 500,000 per year.
- Carry subsidized local passenger and run goods lines to serve rural areas in the Southern Region (Blantyre).

Table 3.2.1 Trend of Railway Transport

Year	Freight	Passengers		Growth Rate		
	Net Tonne km (d)	Passenger km	Number	Freight (ton km)	Passengers (passenger/km)	No. of passengers
	(000)	(000)	(000)	(%)		
2000	79,747	24,789	418	-	-	-
2001	66,238	21,883	362	-16.9	-11.7	-13.4
2002	64,036	42,323	660	-3.3	93.4	82.3
2003	17,909	30,311	488	-72.0	-28.4	-26.1
2004	26,055	29,523	394	45.5	-2.6	-19.3
2005	20,957	10,418	175	-19.6	-64.7	-55.6
2006	20,323	28,670	449	-3.0	175.2	156.6
2007	32,721	43,815	653	61.0	52.8	45.4

Source: National Statistical Year 2008

Freight Transport

Both international and indigenous transport companies are operating in Malawi. International operators are mostly from South Africa and Zimbabwe and are capturing most (70% according to some industry sources) of international trade logistics.

Local companies are providing logistics in Malawi, which is somehow a protected market, as Malawi does not adhere to the third party rule. They are also providing international freight services to the closest destination, the Beira port in Mozambique.

The Malawi haulage sector is dominated by a handful of medium-sized hauling companies that operate 100 vehicles or more. The companies are registered with the Road Transport Association. The rest of the haulage companies are family-type or small companies (10-20) that are not very commercially efficient and not competing with the organized sector.

Freight market in Malawi is not competitive because of small and seasonal freight transport. The main export products are agricultural crops such as tobacco, sugar and tea. Back load is inherently difficult to organize and is not actively sought. As a consequence, carriage utilization is sub-optimal.

Due to limited financial condition, local trucking companies buy obsolete vehicles that have very short life, usually 5 years, and suffer from high operating costs (fuel and maintenance). Although these vehicles are bought at rather low prices, they are heavily taxed. An imported second hand truck is charged with a 25% duty, 35% surtax and 30% excise duty. Meanwhile, South African trucking companies usually use new vehicles and their operating cost is lower than that of local trucking industry.

Air Transport

Malawi is a landlocked country and air transport plays an important role in the transportation of passengers, cargo and mail.

The Department of Civil Aviation under the Ministry of Transport and Public Infrastructure is responsible for safe, efficient and cost effective air transport service. Its roles include the following:

- To regulate and facilitate development of a sustainable air transport industry in Malawi
- To provide aviation-related services such as aviation licensing, air traffic management, aeronautical information, communication, flight operations, fire and rescue, aerodrome services, and aeronautical telecommunications engineering services

Malawi has two primary international airports, namely Kamuzu (Lilongwe) and Chileka (Blantyre) international airports, and three secondary airports at Karonga, Mzuzu and Club Makokola which cater to charter and general aviation aircraft. Mzuzu and Karonga are government owned airports while Club Makokola is a privately registered airport. Apart from the above airports, there are about 24 minor aerodromes scattered in the country but most of these aerodromes have small scale facilities such as unpaved airstrips.

The Kamuzu International Airport (KIA) is the country's main gateway airport. Construction of KIA was planned in line with the transfer of the capital city from Zomba to Lilongwe. KIA started its operations in 1983. Financial assistance for the construction of the terminal building and air navigation equipment was provided by the Japanese Government.

The KIA is located north of the town and accommodates about 50 domestic and international flights every week. KIA has 1 passenger terminal, 1 cargo terminal, and 14 aircraft stands.

Air Malawi is the national carrier and is wholly owned by government. Air Malawi has three aircrafts – a B737/300, an ATR 42 and a 12-seater Cessna Turboprop – that provide regional (Johannesburg, Nairobi, Dar es Salaam and Harare) and domestic (between Lilongwe and Blantyre) scheduled services, as well as charters.

Table 3.2.2 Handling Volume of Passengers and Cargo at Kamuzu International Airport

		2000	2001	2002	2003	2004	2005	2006	2007	Growth Rate 2007/2000
Passengers	Arrival									
	International	63,816	61,222	50,122	56,480	59,826	60,375	63,324	79,742	1.25
	Domestic	26,654	23,720	20,676	18,042	18,727	22,703	21,349	23,810	0.89
	Sub-total	90,470	84,942	70,798	74,522	78,553	83,078	84,673	103,552	1.14
	Departure									
	International	60,219	53,773	51,276	54,069	54,920	61,589	66,584	83,005	1.38
	Domestic	29,366	30,704	23,505	25,085	27,455	33,943	30,971	35,752	1.22
	Sub-total	89,585	84,477	74,781	79,154	82,375	95,532	97,555	118,757	1.33
	Transit									
	International	28,161	24,701	24,293	24,734	30,927	27,532	39,116	68,606	2.44
	Domestic	32	42	1,124	5	3	-	-	-	-
	Sub-total	28,193	24,743	25,417	24,739	30,930	27,532	39,116	68,606	2.43
	Total									
	International	152,196	139,696	125,691	135,283	145,673	149,496	169,024	231,353	1.52
	Domestic	56,052	54,466	45,305	43,132	46,185	56,646	52,320	59,562	1.06
	Sub-total	208,248	194,162	170,996	178,415	191,858	206,142	221,344	290,915	1.40
Freight/Mail (ton)	Arrival									
	Loaded	663	678	546	330	548	461	351	425	0.64
	Unloaded	244	228	236	204	129	89	169	196	0.80
	Sub-total	907	905	782	534	677	549	519	621	0.68
	Departure									
	Loaded	3,315	2,063	1,960	1,628	1,981	1,861	2,787	3,568	1.08
	Unloaded	118	164	226	101	175	164	134	154	1.30
	Sub-total	3,433	2,227	2,186	1,729	2,156	2,026	2,921	3,722	1.08
	Transit									
	Loaded	634	401	489	868	617	704	1,131	1,986	3.13
	Unloaded	-	-	-	-	-	-	-	-	-
	Sub-total	634	401	489	868	617	704	1,131	1,986	3.13
	Total									
	Loaded	4,611	3,141	2,995	2,827	3,146	3,026	4,269	5,980	1.30
	Unloaded	363	392	462	305	304	253	303	349	0.96
	Sub-total	4,974	3,533	3,457	3,132	3,450	3,278	4,572	6,329	1.27

Source: Department of Civil Aviation

3.2.2 Road Traffic Conditions in Lilongwe City

(1) Registered Vehicles, Transportation Share

The Directorate of Road Traffic, Ministry of Transport and Public Infrastructure, is responsible for the registration of vehicles. There are three regional offices in Lilongwe, Blantyre and Mzuzu for vehicle registration in Malawi.

Because vehicle owners can register at any regional office, there is no breakdown of

vehicle registration data by region. The number of registered vehicles at the Lilongwe regional office shown in Table 3.2.3 is estimated.

The number of registered vehicles has peaked at around 14,700 in 2003 and varies from 4,700 to 6,800 annually from 2004 onwards. The average annual growth rate of registered vehicles on an accumulated basis is 16.7% from 2003 to 2008 as shown in Table 3.2.3.

A passenger car (sedan) type has the highest number of registered vehicle followed by pick-up truck and truck over the same period.

Table 3.2.3 Number of Registered Vehicles in Lilongwe Regional Office (2002-2008)

Type	2002	2003	2004	2005	2006	2007	2008	Total
Bus	56	69	41	23	21	36	48	294
Chassis-cab	65	95	19	31	19	14	24	267
Combi/Micro bus	24	39	7	11	10	9	10	110
Construction	6	4	1	1	2	3	-	17
Coupe	18	29	110	8	10	12	7	194
Dropside	117	156	-	167	163	171	195	969
Mini Bus	941	930	605	523	332	372	296	3,999
Motorcycle	515	1,328	536	498	396	465	426	4,164
Not Applicable	466	640	339	244	127	106	101	2,023
Pick-up	2,466	4,031	1,579	1,220	771	837	648	11,552
Saloon	2,644	4,702	2,119	1,808	1,734	2,214	1,805	17,026
Station wagon	771	1,088	-	610	595	670	631	4,365
Tractor	80	211	143	102	86	137	87	846
Truck	1,044	1,137	684	649	404	549	511	4,978
Van body	75	111	32	22	24	32	27	323
Others	167	150	616	57	66	57	68	1,181
Total	9,455	14,720	6,831	5,974	4,760	5,684	4,884	52,308
No. of Accumulated registered Vehicles	9,455	24,175	31,006	36,980	41,740	47,424	52,308	-
Annual growth rate (%) of accumulated	-	155.7%	46.4%	87.5%	79.7%	119.4%	85.9%	51.7%

Remarks: Average annual growth rate for accumulated registered vehicle during 2003 – 2008

Source: Department of Road Traffic, Ministry of Transport & Public Infrastructure

(2) Existing Road Network

1) Road classification

Functional Road Classification

Road network in Lilongwe City is composed of main roads, secondary roads and minor (urban) roads. A main road functions as a regional (major) arterial road, secondary as an arterial road, and minor road as a major collector/feeder road.

M1 (National Road No.1), as a regional arterial road, forms the north-south trunk axis. Secondary and urban roads extended from M1 to main urban development areas and settlements especially in the southern part of the city. The new city centre is directly connected to the Old Town through the Kenyatta road that functions as an arterial road.

In order to avoid traffic through the city centre areas, the central part of the western bypass have already been constructed and currently operates. Nevertheless, it does not fully function because the whole western bypass is not yet constructed. Accordingly, traffic congestion around the Lilongwe Town Hall (Glyn Jones) roundabout is observed

during commuting time.

According to the future road network plan in the 1986 Outline Zoning Scheme in Lilongwe City, all main and secondary roads including their Right of Way (ROW) were planned as 4-lane roads. However, main and secondary roads are basically constructed as 2-lane roads because of low traffic volumes except for some sections of the Paul Kagame road, which have 4 lanes.

Main and secondary roads in the City are well developed in terms of pavement condition. Their ROWs range from 45 to 60 m, which provide wide road reserve areas (more than 17 m on each side). However, some business establishments and residential houses were built up within the ROW along some parts of M1 in the Old Town and its vicinity and other roads. Especially, sections of M1 between Paul Kagame and Kawala roads do not have enough allowance to keep the original ROW due to the above encroachment in the road reserves but still have enough land areas for expansion to a 4-lane road.

Table 3.2.4 Road Classification by Roads Authority

Road		Function	Definition
Main road		Mobility / Arterial	Linkage of main administrative centre, major centre of population and important border crossings into a coherent road network.
Secondary road		Mobility / Collector	Links settlements with a large population, established border posts and important sites of international or national interest with the main road network.
Minor road	District road	Access / Local	Links all villages with a relatively large population to the main/secondary network, or links all district centre to the tertiary network.
	Urban road	Access / Local	Provides access to properties and residential area.
	Community road	Access / Local	Links farms/estates to households/villages/local markets. Accessible to mostly non-motorized traffic.

Source: Planning Guideline, Providing Rural Transport Infrastructure, Ministry of Transport & Public Infrastructure

Table 3.2.5 Road Classification by Lilongwe City Council

Road Classification	Function	Road Structure	Design Speed (km/hr)	Reserve Width (meter)	RA Classification
Primary Distributor	To form the primary network for the city and cater to all long-distance movements to, from within the city	Dual 11m carriageways + cycleways + footways	70 (85)	46	Main Road or Secondary
Secondary Distributor	To distribute the traffic between residential, industrial and commercial districts of the city and to form the link between the primary network and the roads within the districts	Dual 7.3 m carriageways + cycleways + footways	70	35	
Major Local Distributor	To distribute the traffic within the districts. A large traditional housing area with an excess of 900 houses (or 600 houses in the case of low density, high car-owning areas) may need major distributor, together with one or more minor distributors.	Single 7.3 m carriageways + cycleways + footways	60	24	Urban Road
Minor Local Distributor		Single 7.3 m carriageways + footways	50	18	
Access Road					
- Primary residential street	To link individual plots (houses, offices, shops, industrial premises, etc.) with the distributor roads. All streets in residential areas must be designed for consistent slow speeds in the interest of road safety. A secondary street in a traditional residential area may serve up to 60 house lots (30 in low density areas) and will normally take the form of cul-de-sac (max. length 150 m) or loop road (max. length 500 m) carrying only access traffic. Primary streets in traditional residential	5.5 m carriageway + one footway	-	15	Community Road
- Secondary residential street		4.1 m or 5.5 m carriageway	-	12	
- Primary shopping street		7.3m carriageway + footways + curb side parking areas (optional)	-	-	Urban Road
- Secondary shopping street		6.75 m carriageway + footways + curb side parking areas (optional)	-	-	

- Service road	areas must serve up to 120 house lots (60 in low density areas). Minor streets in shopping centres serve as service roads.	5.5 m carriageways for two-way flow, 4 m for one-way flow	-	-	
- Industrial area		7.3 m carriageway	-	-	

Source: Town & Country Planning Standards and Guidelines for Development, 1986

The existing road network is shown in Figure 3.2.3.



Source: JICA Study team

Figure 3.2.3 Existing Road Network in Lilongwe City

Road Length and Pavement Condition

Road network in Lilongwe City is comprised of main, secondary, urban and community

roads. The total road length in the City is approximately 585 km excluding approximately 137 km of community roads. The road density in the city excluding community roads is 0.29 km/km².

Table 3.2.6 Surface Type by Road Classification (unit: m)

Surface Type	*Main Road	*Secondary Road	**Urban Road	**Community Road	Total
Paved Road	59,700	27,200	45,304	130,742	262,946
Asphalt	16,500	-	8,195	23,939	48,634
Chip Seal	43,200	-	26,301	88,638	158,139
Slurry Seal	-	27,200	10,808	18,165	56,173
Unpaved Road	0	2,700	2,105	317,295	322,100
Gravel	-	-	-	3,256	3,256
Earth	-	2,700	2,105	314,039	318,844
Total	59,700	29,900	47,409	448,037	585,046

Source: Roads Authority & JICA Study Team

Remarks: *: The road inventory survey was conducted for main and secondary roads in August 2009.

** : Roads Authority's database is used for the length of urban and community roads.

The pavement ratios in the City are 45% and 96% in case of including and excluding community roads, respectively. Though all main roads and most secondary roads are paved, damages on paved carriageways are observed. They are caused by poor maintenance works, unpaved shoulders and improper installation of roadside ditches. The pavement ratio of community roads is only 29% and some unpaved sections of the roads are impassable during the rainy season.

Table 3.2.7 Pavement Ratio by Road Surface Type

Surface Type	*Main Road	*Secondary Road	**Urban Road	**Community Road	Total
Paved Road	100.0	91.0	95.6	29.2	44.9
Asphalt	27.6	-	17.3	5.3	8.3
Chip Seal	72.4	-	55.5	19.8	27.0
Slurry Seal	-	91.0	22.8	4.1	9.6
Unpaved Road	0.0	9.0	4.4	70.8	55.1
Gravel	-	-	-	0.7	0.6
Earth	-	9.0	4.4	70.1	54.5
Total	100.0	100.0	100.0	100.0	100.0

Source: Roads Authority & JICA Study Team

Remarks: * The road inventory survey was conducted for main and secondary roads in August 2009.

** Roads Authority's database is used for the length of urban and community roads.

Drain Condition

All main and secondary roads have roadside ditches along both sides; however, some sections have no proper drain facilities. About 25% of community roads have no roadside ditches as shown in Table 3.2.8. Moreover, community roads with ditches along both sides account for only 5%.

Table 3.2.8 Roadside Drain Condition

Drain Type		*Main Road		*Secondary Road		**Urban Road		**Community Road		Total	
		Length (m)	%	Length (m)	%	Length (m)	%	Length (m)	%	Length (m)	%
Drainage	One side	-	-	-	-	38,693	81.6	313,112	69.9	441,405	75.4
	Both sides	59,700	100.0	29,900	100.0	5,511	11.6	22,286	5.0	27,797	4.8
	Sub-total	59,700	100.0	29,900	100.0	44,204	93.2	335,398	74.9	469,202	80.2
No drainage		-	-	-	-	3,205	6.8	112,639	25.1	115,844	19.8
Total		59,700	100.0	29,900	100.0	47,409	100.0	448,037	100.0	585,046	100.0

Remarks: * The road inventory survey was conducted for main and secondary roads in August 2009.

** Roads Authority's database is used for the length of urban and community roads.
Source: Roads Authority & JICA Study Team

Land Use Along Roads

Table 3.2.9 shows land use along roads according to road classification in Lilongwe City. Residential areas along roads account for 66.1%, followed by mixed residential & commercial area (11.8%), agricultural area (7.2%) and mixed residential & agricultural area (6.6%). Open area including agricultural, bush and forest, and others along roads accounts for only 8.3%.

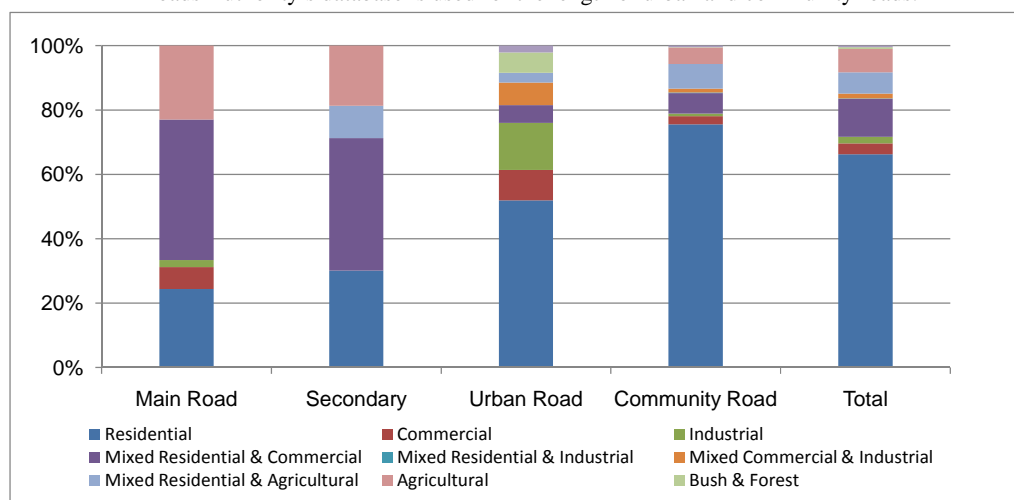
Table 3.2.9 Land Use along Road by Road Classification

Land use	*Main Road		*Secondary		**Urban Road		**Community Road		Total	
	Length (m)	Share (%)	Length (m)	Share (%)	Length (m)	Share (%)	Length (m)	Share (%)	Length (m)	Share (%)
Residential	14,567	24.4	9,000	30.1	24,626	51.9	338,425	75.5	386,618	66.1
Commercial	4,033	6.8	-	0.0	4,443	9.4	11,447	2.6	19,923	3.4
Industrial	1,300	2.2	-	0.0	6,928	14.6	3,641	0.8	11,869	2.0
Mixed Residential & Commercial	26,050	43.6	12,300	41.1	2,630	5.5	28,205	6.3	69,185	11.8
Mixed Residential & Industrial	-	0.0	-	0.0	-	0.0	826	0.2	826	0.1
Mixed Commercial & Industrial	-	0.0	-	0.0	3,338	7.0	5,475	1.2	8,813	1.5
Mixed Residential & Agricultural	-	0.0	3,000	10.0	1,419	3.0	34,463	7.7	38,882	6.6
Agricultural	13,750	23.0	5,600	18.7	-	0.0	23,018	5.1	42,368	7.2
Bush & Forest	-	0.0	-	0.0	3,025	6.4	450	0.1	3,475	0.6
Others	-	0.0	-	0.0	1,000	2.1	2,087	0.5	3,087	0.5
Total	59,700	100.0	29,900	100.0	47,409	100.0	448,037	100.0	585,046	100.0

Source: Roads Authority & JICA Study Team

Remarks: * The road inventory survey was conducted for main and secondary roads in August 2009

** Roads Authority's database is used for the length of urban and community roads.



Source: Roads Authority & JICA Study Team

Figure 3.2.4 Land Use along Road by Road Classification

2) Bridge Condition

There are 18 main road bridges with 866 culverts in the City, out of which two are over railroad.

Bridges are mainly constructed using concrete materials. Many bridges cross the Lilongwe River. The Lilongwe Bridge on M1 road near the Lilongwe Town Hall (Glyn Jones) roundabout is shown in Photograph 3.2.1. The location of main road bridges is shown in Figure 3.2.5. These bridges are not deteriorated; however, appropriate

maintenance system is needed for sustainable usage.

Culverts are mainly installed with concrete material; but 44.1% of the total culverts are under poor condition.

In addition, simple wood-made bridges (as shown Photograph 3.2.2) are privately installed over the Lilongwe River and other rivers (apparently, a toll of MWK 10 is collected). These bridges have the risk of being washed away during the rainy season.



Source: JICA Study Team

Photograph 3.2.1 Lilongwe Bridge



Source: JICA Study Team

Photograph 3.2.2 Wood Bridge

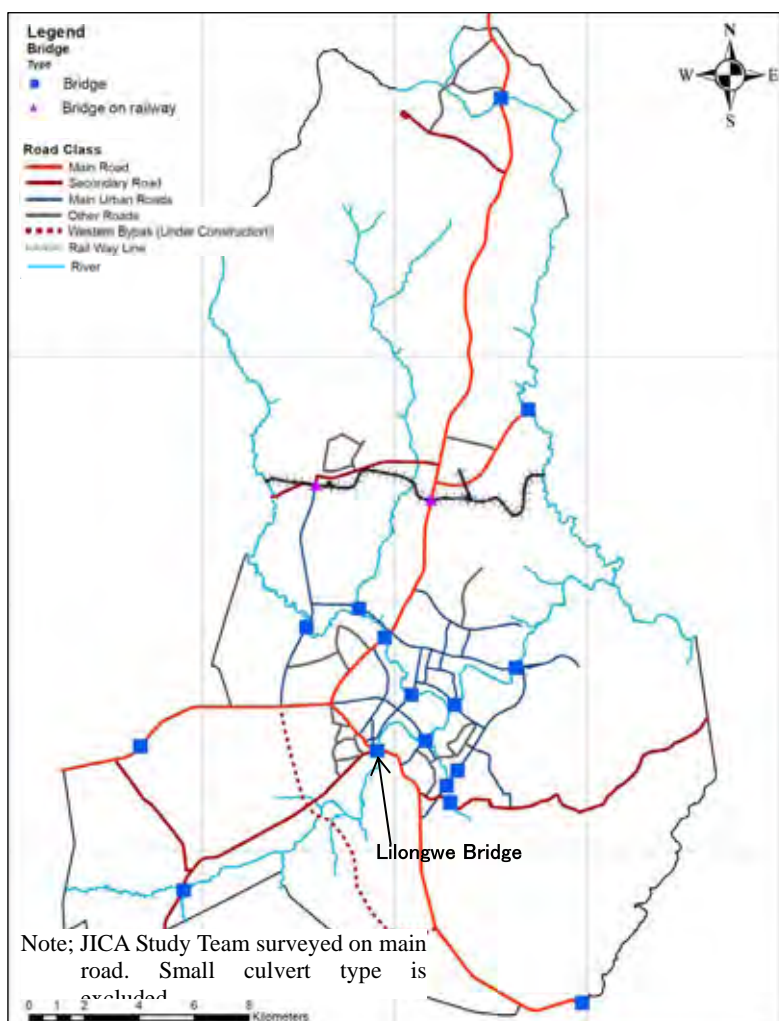


Figure 3.2.5 Location of Existing Bridges

(3) Traffic Volume

Table 3.2.10 shows the JICA Study Team's traffic survey in 2009 and the Roads Authority's past surveys from 2006 to 2008. Traffic volume during the rainy season is slightly lower than during the dry season in 2006 and 2007.

The highest traffic volume of 12,800 vehicles per day is observed on the Paul Kagame Road in 2009. This almost corresponds to the road capacity of a 2-lane road. This road was thus expanded to a 4-lane road with a distance of approximately 5 km from the M1 intersection. This is the first 4-lane road in the city to ease traffic congestion on the M1 starting from Blantyre, passing through Lilongwe, then through to Mzuzu. The project was completed in 2006 and financed by the World Bank.

Table 3.2.10 Trend of Traffic Volume

No.	Road	Station	2006		2007		2008	2009
			Feb	Aug	Mar	Sept	Nov	July
			Wet	Dry	Wet	Dry	Dry	Dry
Traffic Volume								
1	KIA access road	Junction with M1	802	960	975	1,100	1,308	1,499
2	M1	Magwere	2,766	3,351	2,942	3,734	3,785	3,959
3	M1	Junction with T361	888	1,192	790	1,222	-	-
4	M1	Othambwe	1,404	1,727	1,508	1,695	2,055	-
5	M1	Bunda Turn off	4,068	3,686	-	-	-	5,399
6	Paul Kagame road	Total Filling Sta.	10,237	11,728	-	-	-	12,831
Annual Growth Rate (%)								
1	KIA access road	Junction with M1	-	-	6.9	13.5	16.2	14.6
2	M1	Magwere	-	-	-11.9	10.6	1.2	6.9
3	M1	Junction with T361	-	-	8.0	2.3	-	-
4	M1	Othambwe	-	-	-	-1.7	18.2	-
5	M1	Bunda Turn off	-	-	-	-	-	13.2
6	Paul Kagame road	Total Filling Sta.	-	-	-	-	-	2.3

Source: Roads Authority & Traffic Survey by JICA Study Team, 2009

A traffic growth rate of more than 10% is observed in the suburb areas of Lilongwe City from 2006 to 2009; however, the inner areas do not show high growth rate, especially Paul Kagame Road which has a growth rate of 2.3%. This low growth rate may be attributed to the congested Lilongwe Town Hall (Glyn Jones) roundabout causing some vehicles to avoid it.

The JICA Study Team conducted the traffic survey at 10 locations from July to October in 2009. Figure 3.2.5 shows the location of survey points while Table 3.2.11 presents the traffic volume at the 11 locations.

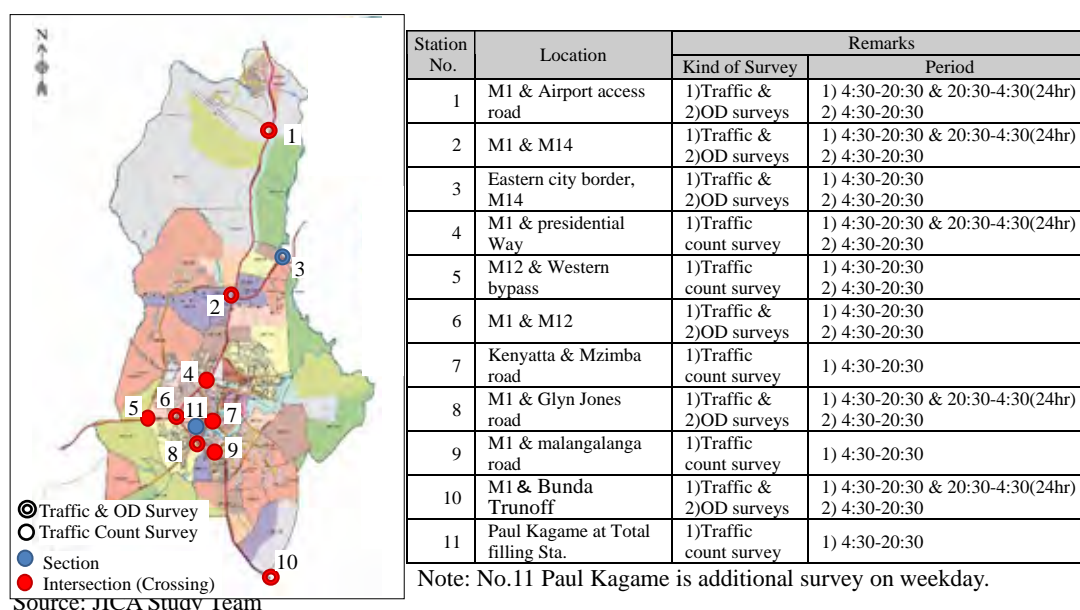
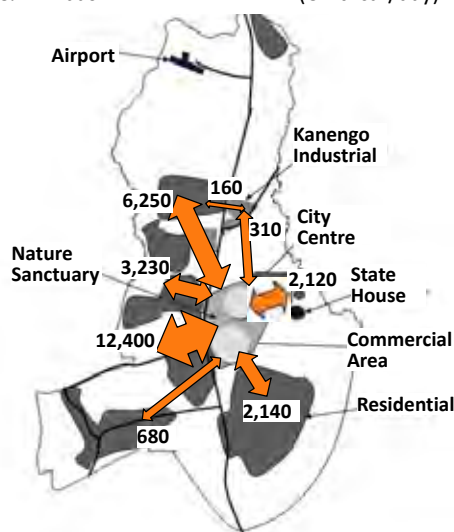


Figure 3.2.6 Location of Traffic Survey

Inner-city All vehicles Traffic Flow in Lilongwe, 2009

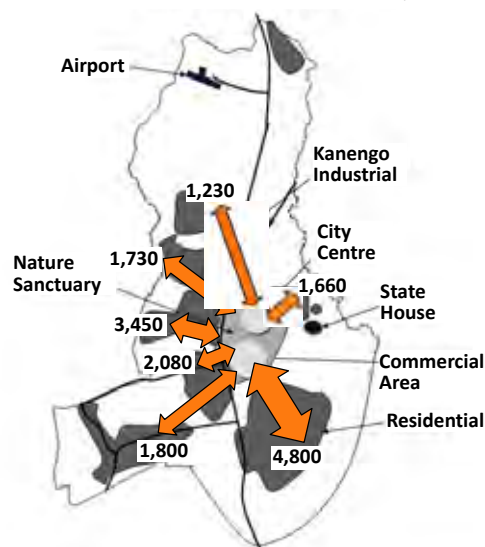
Excluding bus & minibus

(Unit: car/day)



Inner-city Minibus Vehicle Flow in Lilongwe, 2009

(Unit: car/day)



Source: JICA Study Team

Figure 3.2.7 Inner-city Vehicle Traffic Flow to Old Town and City Centre, 2009

Figure 3.2.7 shows the inner-city traffic flow to the Old Town and City Centre. The left figure showing the inner-city all vehicles flow features the trunk traffic flow connecting the central business district (CBD) in the Old Town and City Centre area, and the western part of the city. On the other hand, the right figure, comprising major minibus vehicle flows, shows the outstanding traffic flow between the CBD and the southern & western part of the city. The traffic flow of mini bus from Likuni, the western suburbs in the City, is relatively high. The high mini bus traffic flow is generated by commuters dwelling in unplanned settlements in the southern and western areas and low/medium density residential areas in the western suburbs.

Table 3.2.11 Traffic Volume for Motorized Vehicle in Lilongwe City, 2009

Road	I: Motorcycle		II : Light Vehicle			III : Heavy Vehicle			Total of Motorized Vehicle	Non-motorized Vehicles	
	Motorcycle	Motorbike Trailer	Saloon/Pick up/Wagon	Light Truck	Mini Bus	Bus	Medium - Heavy Truck	Heavy & Full Trailer Truck		Bicycle	Pedestrian
M1 & Airport Access											
Weekday											
Road to Airport	29	1	1,236	64	79	18	56	15	1,499	46	14
Road to Lilongwe	69	7	2,228	242	762	81	187	198	3,775	285	86
Road to Kasungu	63	7	2,333	259	767	93	227	210	3,959	284	89
Weekend											
Road to Airport	14	1	1,024	102	60	8	9	26	1,244	49	46
Road to Lilongwe	28	19	2,537	156	536	97	150	154	3,677	300	181
Road to Kasungu	40	18	2,641	254	558	95	153	128	3,887	311	205
M1 & M14											
Weekday											
Road to Lilongwe	89	23	6,167	606	2,490	181	509	538	10,603	215	2,545
Road to Kasungu	104	26	7,062	694	2,613	301	709	758	12,266	214	760
Road to Salima	57	21	2,948	440	449	165	519	485	5,084	256	1,913
Weekend											
Road to Lilongwe	59	17	6,182	557	2,916	278	767	636	11,412	261	2,599
Road to Kasungu	119	27	8,836	798	3,545	626	1,479	1,554	16,984	342	1,017
Road to Salima	80	12	3,626	509	749	366	834	1,044	7,220	361	1,698
Salima Road, City Border											
Weekday	24	14	774	471	237	52	292	46	1,910	653	1,158
Weekend	10	15	1,000	330	225	64	215	23	1,881	787	2,016
M1 & Presidential Way											
Weekday											
Road to Old town	107	4	7,531	369	1,588	169	405	177	10,351	399	1,591
Road to Capital hill	78	8	6,590	517	1,288	176	286	132	9,074	407	985
Road to Kanengo	113	17	7,488	519	1,421	147	486	176	10,367	362	1,219
Road to Munzu	76	9	7,171	421	1,040	165	232	135	9,250	395	1,338
Weekend											
Road to Old town	30	0	6,418	127	543	33	86	53	7,290	457	661
Road to Capital hill	75	0	9,415	257	3,376	130	402	136	13,791	343	967
Road to Kanengo	24	0	8,175	238	992	135	167	83	9,814	480	1,251
Road to Munzu	43	0	7,734	334	3,085	134	477	140	11,947	234	775
M12 & Western Bypass											
Weekday											
Road to Lilongwe	54	11	2,794	317	746	57	146	95	4,220	607	304
Road to Mchinji	61	4	3,364	312	982	67	196	114	5,099	752	409
Kaunda road	44	7	2,818	210	716	22	120	77	4,016	379	196
Weekend											
Road to Lilongwe	105	13	1,939	206	605	44	100	53	3,064	333	342
Road to Mchinji	131	23	3,104	202	843	61	108	63	4,536	403	389
Kaunda road	107	17	2,441	155	546	29	54	17	3,367	200	289
M1 & M12											
Weekday											
Road to Old town	74	4	7,087	226	1,709	56	204	105	9,465	806	1,684
Road to Kasungu	78	4	6,752	235	1,475	56	231	116	8,947	580	697
Road to Paul Kagome	57	3	4,527	199	1,068	37	192	108	6,191	652	957
Road to Mchinji	59	3	4,227	174	681	29	148	78	5,398	447	1,344
Weekend											
Road to Old town	24	0	7,806	250	2,302	58	186	90	10,716	595	1,031
Road to Kasungu	29	0	7,262	217	2,123	56	179	76	9,943	457	290
Road to Paul Kagome	15	0	2,441	74	894	104	69	60	3,656	447	851
Road to Mchinji	10	0	2,571	120	489	86	115	37	3,428	381	518
Mzimba Road & Kenyatta Road											
Weekday											
Road to Old Town	215	16	8,216	391	957	160	360	193	10,508	731	919
Mzimba Road	238	10	8,581	536	1,297	167	400	191	11,421	659	1,556
Road to City Centre	298	19	10,153	488	994	260	584	299	13,095	824	532
Road to Paul Kagome	284	29	8,563	493	1,301	186	453	294	11,603	671	746
Weekend											
Road to Old Town	53	3	7,346	310	397	145	231	65	8,551	797	2,565
Mzimba Road	47	4	5,787	212	846	113	170	73	7,253	319	580
Road to City Centre	55	1	5,731	210	277	82	140	44	6,541	662	1,493
Road to Paul Kagome	41	2	3,066	84	676	24	73	44	4,011	240	826
M1 & Likuni Road											
Weekday											
Road to Escom	44	8	1,892	260	182	27	52	30	2,495	110	6,444
Road to Old Town	174	446	16,153	668	9,029	141	266	133	27,010	2,242	8,161
Road to Paul Kagome	133	53	9,560	453	5,001	63	192	89	15,545	1,642	6,308
Road to Likuni	80	396	8,845	409	4,289	89	113	58	14,280	1,157	9,412
Weekend											
Road to Escom	40	185	975	156	137	28	50	51	1,622	53	7
Road to Old Town	139	66	5,120	329	2,852	85	138	92	8,821	878	9
Road to Paul Kagome	106	65	5,908	364	2,822	50	198	77	9,590	822	3
Road to Likuni	115	184	4,025	319	1,721	47	138	66	6,615	559	1

9	M1 & Malangalanga Road											
	Weekday											
	Road to Bridge	175	1	6,058	1,178	2,394	91	88	137	10,121	1,862	13,732
	Road to Blantyre	171	1	6,231	1,087	2,264	128	95	138	10,114	1,484	8,290
	Road to LL Girls	45	0	3,154	319	234	69	15	9	3,844	569	10,006
	Weekend											
	Road to Bridge	66	0	4,516	682	2,102	72	129	99	7,666	1,003	11,648
	Road to Blantyre	61	0	4,660	630	2,131	116	141	97	7,836	833	7,664
	Road to LL Girls	7	0	2,303	169	181	58	15	5	2,737	290	9,572
10	M1 & Bunda Trunoff											
	Weekday											
	Road to Lilongwe	67	0	2,580	698	1,397	118	321	218	5,399	943	54
	Road to Blantyre	65	5	1,517	481	955	104	189	106	3,422	670	0
	Road to Bunda	56	5	1,282	226	599	56	89	46	2,358	775	54
	Weekend											
	Road to Lilongwe	29	0	1,239	257	630	59	194	58	2,466	157	2
	Road to Blantyre	14	6	1,002	225	691	29	165	23	2,155	140	3
	Road to Bunda	24	6	712	188	533	23	123	19	1,628	190	4
11	Paul Kagame											
	Weekday											
	Paul Kagame at Total Filling Sta.	124	14	11,548	523	449	26	122	26	12,831	1,613	20

Note: No.11 Paul Kagame is additional survey result on weekday.

Source: Traffic Survey by JICA Study Team, July 2009

The surveyed traffic volumes vary between 1,200 and 27,000 cars/day as shown in Table 3.2.11.

The most serious bottleneck point is the section between the Lilongwe Town Hall (Glyn Jones) roundabout and the Old Town in Area 1, where the daily traffic volume is 27,000 cars/days. This almost reaches the road capacity of a 2-lane road. The traffic volumes of other sections are within the road capacities. Table 3.2.12 shows the major congested areas in Lilongwe City.

Table 3.2.12 Major Congested Area in Lilongwe City

Congestion Area	Congested section	Description
Area 3	Lilongwe Town Hall roundabout - Lilongwe river bridge on M1	Exceeds the road capacity Overflow of pedestrians in the bridge Most serious bottleneck point
	Lilongwe Town Hall roundabout - Paul Kagame road On M1	Long queue caused by traffic jam at Lilongwe Town Hall roundabout
	Lilongwe Town Hall roundabout – Colby road on Likuni (S124)	Long queue caused by traffic jam at Lilongwe Town Hall Jones roundabout
Area 2	Lilongwe river bridge – Kawale road	Exceeds the road capacity
	Junction with M1 and Kawale road	Congestion caused by through traffic that avoids the traffic jam at Lilongwe Town Hall roundabout
Area 1	Bus & minibus Terminal area	Mixed movement between vehicles and pedestrians on narrow roads
	Central Market area	
Area 4	M1 - Youth Drive on Kenyatta road	Busy street with business and shopping areas Congested during morning, lunch and late afternoon peak times
Area 15 & 18	M1 in Area 15 & Area 18	Congested during morning and late afternoon peak times

Source: JICA Study Team

Traffic congestions take place at roundabouts, bridge sections and around bus and minibus terminal areas during peak hours. Moreover, traffic congestion at minibus depots in the Old Town is caused not only by the traffic volume but also by minibuses waiting for passengers on the roadside. Most minibus routes concentrate on minibus depots in the Old Town. Furthermore, street vendors flood the carriageways at bus and minibus terminals areas. Thus, a chaotic movement between vehicle traffic and pedestrians is observed at minibus depots and bus terminal and central market in Area 1 as shown in Figure 3.2.8.

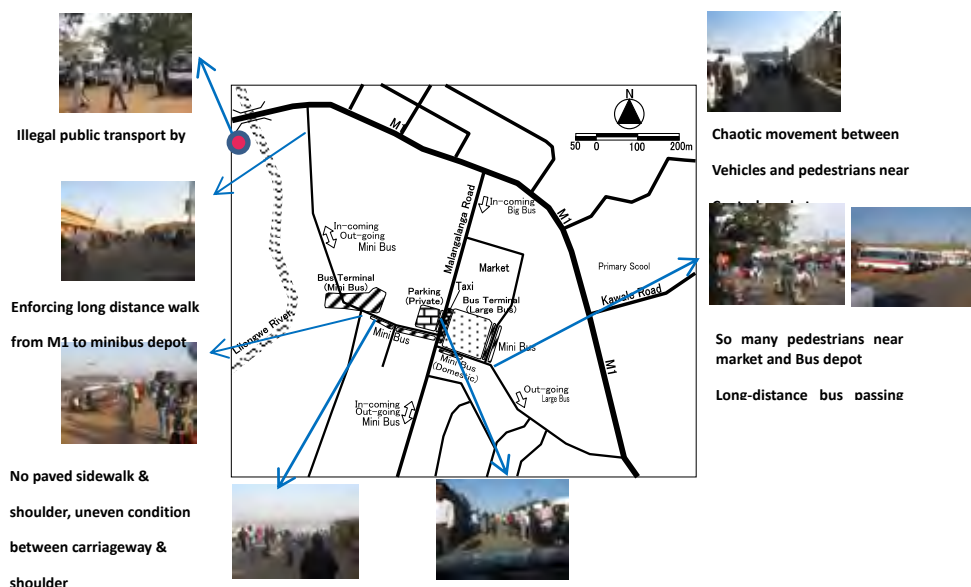
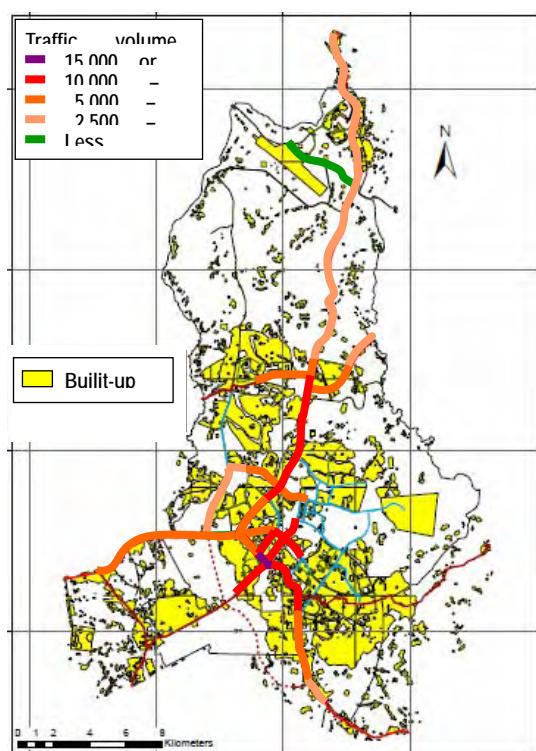


Figure 3.2.8 Chaotic Movement around Central and Bus & Minibus Terminal in the Old Town



Source: Traffic survey result by JICA Study Team

Figure 3.2.9 Traffic Volume of Main Road in Lilongwe City, 2009

3.2.3 Road Network and Management

(1) Roads Authority

According to the Local Government Act (1998) and Decentralization Policy (1998), the city and district assemblies are responsible for district roads, township roads, city roads

and housing estate roads.

The Roads Authority (RA) established in 2006 through an Act of Parliament (No. 3 of 2006) is responsible for the construction and management of main and secondary roads. The following are the role and responsibility of the RA:

- To maintain a complete inventory of all public roads
- To make plans and programs for the construction, rehabilitation and maintenance of main and secondary roads
- To execute the construction, rehabilitation and maintenance of roads approved by the Roads Authority Board
- To provide back-up technical capacity for the planning and monitoring of construction and major rehabilitation works
- To monitor all road agencies

Table 3.2.13 Organizations Responsible for Road Management

Class		Organization responsible for road management		Funding
		Malawi	Lilongwe City	
Main	National Road	Roads Authority	Roads Authority	Road Fund/ Donors
Secondary	National Road	Roads Authority	Roads Authority	Road Fund/ Donors
Minor Road	District	Roads Authority	—	Road Fund/ Donors
	Urban	Roads Authority/ City Assembly	Roads Authority/ LCC	Central and Local Revenue/ Donors
	Community	Local Government Assembly	LCC	Central and Local Revenue/ Donors

Source: Malawi National Road Sector Program

Because of Lilongwe City's limited budget and insufficient capability for road management, the RA has conducted the maintenance/rehabilitation project for minor roads through the European Development Fund (EDF).

The objective of the project was to undertake backlog maintenance by adopting appropriate maintenance interventions on prioritized and selected paved roads in Lilongwe City covering a total of 42 km. The road works were completed in 2008.

(2) Lilongwe City Council

The Lilongwe City Council (LCC) is responsible for road development in the City in accordance with the New Local Government Law of 1998. Due to budget constraints, the LCC only handles minor road construction, maintenance and rehabilitation works.

The relevant organizations for road development, maintenance and rehabilitation in the City are shown as follows:

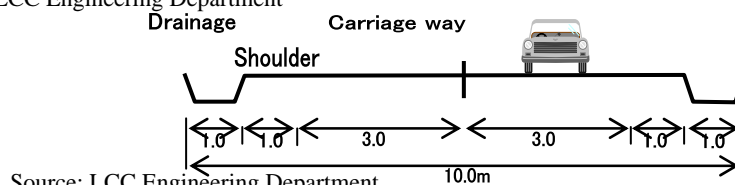
- Directorate of Engineering Services (LCC)
Minor road construction, maintenance and rehabilitation for urban and community roads, management of traffic control and public transport facilities and equipment such as traffic signal, traffic sign, parking area, bus and minibus terminals, bus stops, etc.
- Malawi Housing Corporation
Community road construction in coordination with the LCC

LCC recently conducted the Mzimba road extension project in order to alleviate traffic congestion in the central area of the City as detailed in Table 3.2.14 and Figure 3.2.9.

Table 3.2.14 Construction Works by Lilongwe City Council

Items	Mzimba Road Extension project	
	Area 8	Area 5 & Area 6
Construction cost	40.17 million MWK	Already budgeted in this physical year
Road length	360 m	-
Carriageway	6 m (two-way), slurry sealed pavement	Earthworks completed, not paved
Shoulder	1.0 m each side, unpaved	-
Roadside ditch	1.0 m each side, clayware	-

Source: LCC Engineering Department



Source: LCC Engineering Department

Figure 3.2.10 Typical Cross Section of LCC's Road Design Standard

3.2.4 Existing Public Transport

(1) General Condition

Prior to liberalization and deregulation which took place in the 1980's and 1990's, public enterprises dominated the transport sector in Malawi. Since the 1990's, the transport business has been mostly deregulated, and transport policies have been modified to permit market-oriented decisions, enterprise autonomy and private participation in the ownership and management of transport businesses.

As regards road passenger transport services, the state-owned Shire Bus Lines has been privatized and became the United Bus Service. The company covers transport services throughout the country including minibuses' services. The liberalization of the sector brought about the entry of new bus companies into the passenger services industry in the 1990's. Thereafter, minibus operators began competing with large bus operators on inter-city routes.

The minibus and large bus sector is liberalized in terms of price setting and route allocation.

1) Authority

The Directorate of Road Traffic, Ministry of Transport and Public Infrastructure is responsible for the issuance of driving licenses and business licenses for minibuses. It supervises the Minibus Owners Association of Malawi (MOAM). MOAM manages the operation of minibuses by giving guidance to operators.

The Directorate of Road Traffic is also responsible for the route allocation of minibus operators upon submission of application letters from the MOAM.

There is no regulation on bus/minibus fare system in Malawi. The fare system is determined and fixed by MOAM depending on factors such as fuel price adjustment and operation costs of minibus operators.

About 10,000 companies are registered with the MOAM and approximately 3,000 companies are in Lilongwe City. The registered companies pay annual dues of MWK

1,500 to the MOAM.

(2) Current Public Transport System in the City

Minibuses play a primary role in the public transport system of Lilongwe City. Routes of minibuses spread out from the minibus terminal to many areas inside and outside the city.

At the same time, ordinary buses operate on inter-city routes between the main cities such as Blantyre, Zomba and Mzuzu. They also operate on international routes to South Africa, Mozambique, Zambia, Zimbabwe and Tanzania. Minibuses recently operate on long distance inter-city routes and compete with large bus operators.

Large bus and minibus fares between Lilongwe and Blantyre are MWK 700-1,000 and MWK 1,000 respectively. However, many users choose the minibus service since its frequency is more than that of large buses.

(3) Minibus & Bus Services

1) Bus Route and Minibus Users

There are 11 minibus routes from/to minibus depots in the Old Town in Lilongwe City.

Figure 3.2.10 shows the minibus route map while Table 3.2.15 shows the two bus terminals in Lilongwe City.

Table 3.2.15 Minibus and Bus Terminal in Lilongwe City

	Name of Terminal	Length (m)	Width (m)	Area (m ²)
1	Bwaila Hospital Minibus Terminal	112	80	8,960
2	Bus Terminal along Malangalang road	100	100	10,000

Source: LCC Engineering Department

As shown in Table 3.2.16, the operation time of minibuses ranges from 4:00 a.m. to 8:30 p.m. There are approximately 228,000 minibus passengers on a weekday and about 203,000 on a weekend in the 11 minibus routes.

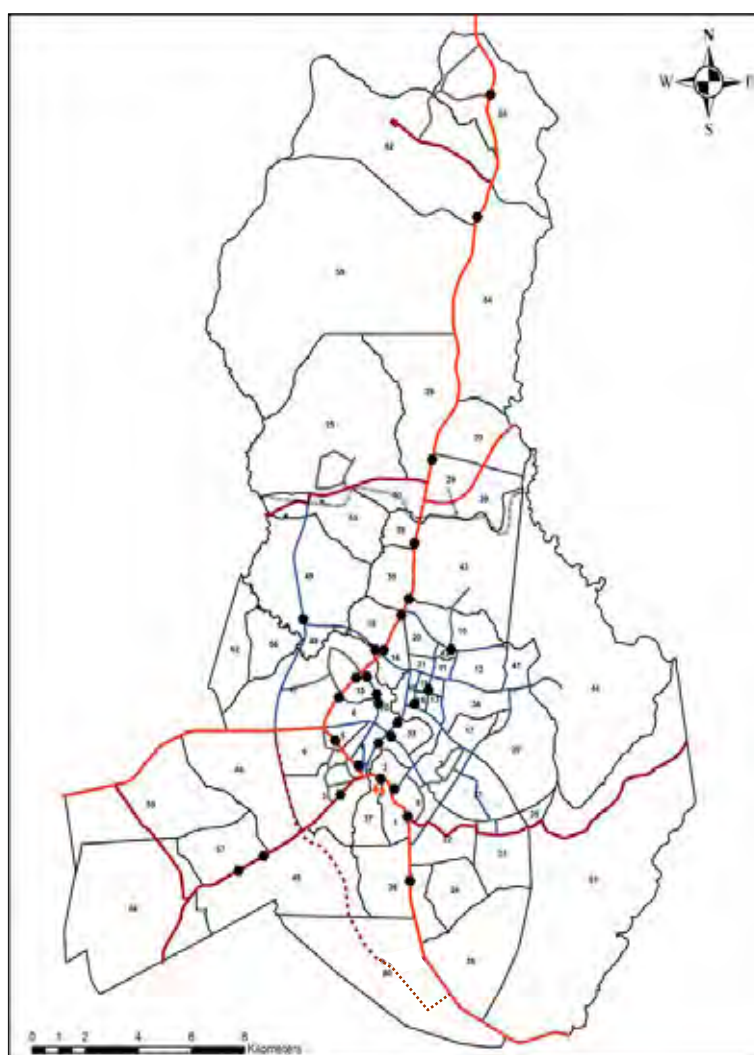
A large number of passengers are observed in Area 23 followed by Area 25, Area 49 and Area 18B. Likuni, the western part of the suburban area, has about 27,000 passengers, followed by Mitundu with approximately 11,000 passengers.

Table 3.2.16 Minibus Services and Number of Passengers

Minibus Routs	Destination	Distance (km)	Operation Time	No. of passengers (Person/day)		Minibus Type (seat/car)	Daily Trip (round trip/car)	Fare (MWK)
				Weekday	Weekend			
1	Area 23	9	4:00-20:00	43,321	61,087	14,16,26	7	80
2	Area 25	21	4:30-19:00	36,893	28,189	14,16	6	90
3	Area 49	15	5:30-19:00	33,303	15,222	14,16,26	6	80
4	Area 36	5	4:00-19:00	14,104	14,137	14,16	7	80
5	Area 24	8	4:00-19:00	13,518	8,922	14,16	7	80
6	Kauma/Area 12	15	5:30-18:00	7,666	5,000	14,16	6	80
7	Likuni	11	4:00-20:30	27,118	26,912	14,16,26	7	80
8	Mitundu	25	5:00-18:00	11,342	2,052	14,16,26	4	250
9	Area 18B	10	5:30-19:00	31,159	36,769	14,16	6	80
10	Lumbadzi	26	5:30-18:00	5,236	4,671	14,16	5	200
11	Mpingu	20	6:00-18:00	4,748	784	-	-	300
Total				228,408	203,745			

As of August, 2009

Source: Mini-bus Owners Association of Malawi & JICA Study team



Source: Mini-bus Owners Association of Malawi & JICA Study team

Figure 3.2.11 Minibus Routes in Lilongwe City

2) Minibus Fare in the City

The minibus fares in the 11 minibus routes vary from 80 to 300 MWK depending on trip distance and road condition as of 2009. The prices increased by an average of 12.5% due to the upsurge of fuel prices in February 2010. Petrol price increased from 213.5 to 256.2 MWK/L while diesel increased from 199.3 to 231.2 MWK/L. These are about 20% upsurge.

3) Characteristics of the Passengers

Main passengers of minibuses are market merchants and white-collar workers such as government officers and private company employees. Low-income class families cannot take minibuses due to high fare (MWK 100). The monthly household expenditure for transport/communication is estimated to be about MWK 3,500 based on Table 2.1.7 and 2.1.8. Thus the monthly expenses for minibuses by family members exceeds over the affordable expenditure for transport/communication. Many other workers and students just walk to their working places or schools because of the unaffordable fare.

4) Road Condition of Minibus Routes

All minibus routes are allocated among the minibus depots in the Old Town and market centres of each Area excluding those of unregistered minibus operators. Main and secondary roads are well developed with paved carriageways while urban and community roads are not always paved. The routes near the markets at Area 23, Area 25, Area 36 and Kauma have earth roads, therefore, they become impassable during the rainy season.

5) Bus Stop (Bus Bay)

In order to avoid obstruction of other traffic, bus bays are provided on both sides of main, secondary and major urban roads along minibus routes because most roads are only two-lane roads. Minibuses shall stop at bus bays for loading and unloading passengers. There are a total of 31 bus bays with 35-45 m length and 4 m width.

Figure 3.2.11 shows the location of bus bays and Table 3.2.17 shows the number of bus bays for minibuses.

Table 3.2.17 Number of Bus Bay (Bus Stop)

Road name	Bus bay (point)	Road name	Bus bay (point)
M1	14	Independence Drive	2
Likuni	3	Chayamba	1
Mzimba	2	Convention	1
Paul Kagame	3	Area18 to Kaunda	2
Kenyatta Drive	3	Total	31

Source: LCC Engineering Department

6) Ordinary Bus Operation as Commuter Transport

Only one ordinary bus operates the passenger service from/to Old Town via Kawale, City Centre, Area 18, Area 25 and Paul Kagame road. Morning and late afternoon are the main operation times. Government officers and private company employees are the

main users.

(4) Taxi Service

Taxis in Malawi should be registered with the Directorate of Road Traffic (RTD) and pay an annual road tax of MWK 15,000. In addition, they are required to have Road Act Insurance which covers not just the vehicles but also the passengers. Registered taxis are required to have a “red number plate” to show that they are for commercial use. The RTD is the main regulator for this sub-sector.

The number of registered taxis in Malawi is estimated to be from 400 to 1,500. In terms of taxi rates, the RTD planned that all registered taxis should have meters in terms of distance and fare. This was abandoned, however, because most taxi owners could not afford them. Currently, the taxi sector uses an agreed zone charge system where fares are charged according to zones as determined by distance. A meter system was proposed a number of years ago but the cost of installing these meters, which would have been borne by taxi operators, proved too expensive. Thus, the proposal was withdrawn.

3.2.5 Traffic Control and Safety

(1) Traffic Control System

The Lilongwe City Engineering Department, National Road Safety Council and Road Fund Administration are involved in traffic control system. The locations of traffic signals, roundabouts, pedestrian overpass and car parks (public) are shown in Figure 3.2.12.

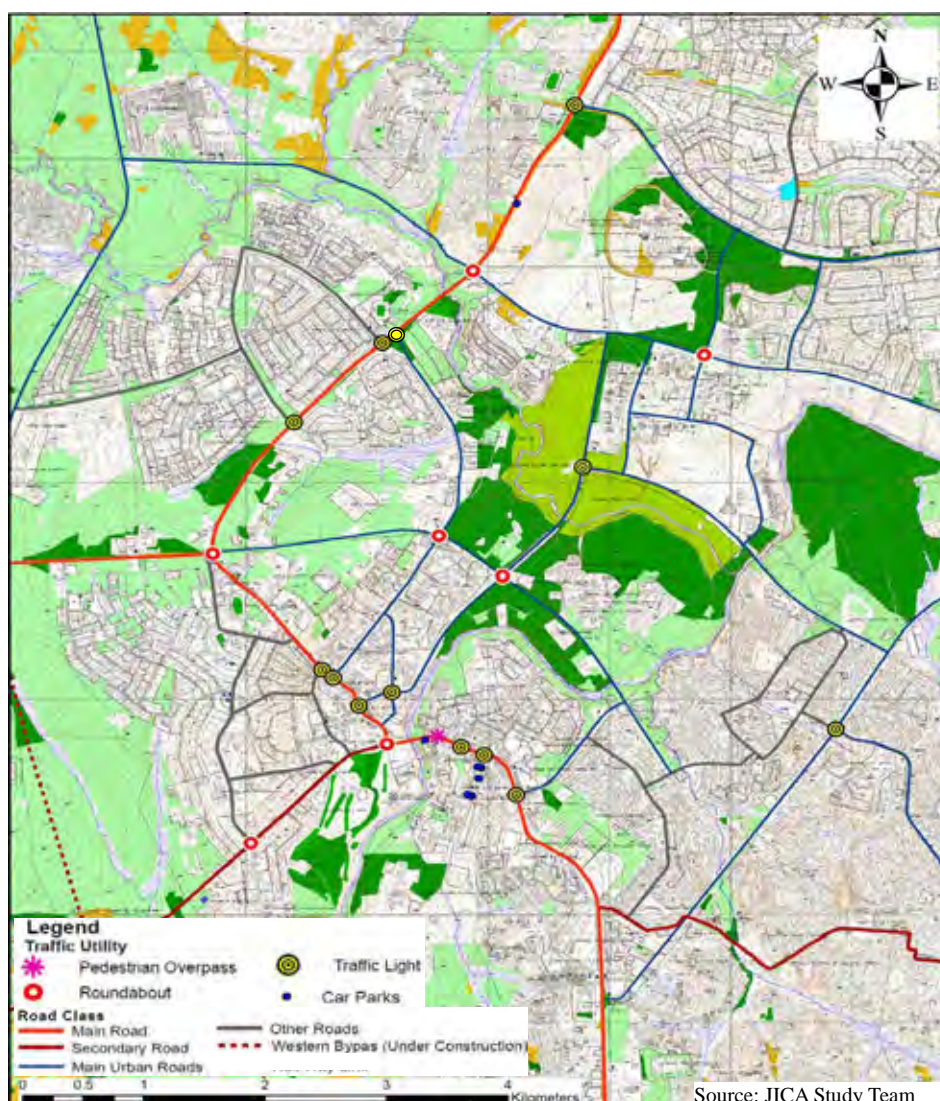


Figure 3.2.12 Existing Traffic Utility

(2) Traffic Accident

The National Road Safety Council of Malawi issues annual road accident statistics. The source of this annual report is the Road Accidents Database managed by the National Road Safety Council in conjunction with the Malawi Police Service. According to the road accident statistics, the total number of traffic accidents tends to decrease in Malawi but the number of fatal accidents has increased, as shown in Table 3.2.18.

In general, traffic accident rates increase in proportion to rising motorization and road development. However, after the number of traffic accidents exceeded 7,000 in 2005, it began to decrease from 2005 to 2007.

A total of 4,435 road accidents occurred in 2007 with 738 classified as fatal accidents and 604 as serious injury cases.

Based on Table 3.2.18 and Figure 3.2.13, most fatal road accidents occurred in the big population centres of Lilongwe, Blantyre and Ntcheu district. In 2007, the fatal accidents in Lilongwe City are estimated at 18%, followed by Blantyre at 15.4%.