



Country scoping of research priorities on low carbon transport in Uganda

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Acronyms

AfDB	African Development Bank
BRT	Bus Rapid Transit
DFID	Department for International Development
GKMA	Greater Kampala Metropolitan Area
KCCA	Kampala Capital City Authority
KMC	Kiira Motors Corporation
MDAs	Ministries Departments and Agencies
MoWT	Ministry of Works and Transport
NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contribution
NDP	National Development Plan



NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
SGR	Standard Gauge Railway
SGS	Société Générale de Surveillance
TLB	Transport Licensing Board
UNFCC	United Nations Framework on Climate Change
UNRA	Uganda National Roads Authority
URC	Uganda Railways Corporation
WHO	World Health Organization



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Abstract	
<p>The UK Department for International Development initiated under its Energy and Economic Growth and High Volume Transport applied research programmes scoping studies to determine research priorities in low-carbon transport in low- and middle-income countries in Asia and Sub-Saharan Africa, including Uganda.</p> <p>The overall objective of these scoping studies was to identify priority research projects that could help advance the transition to a low-carbon transport system in low-and middle-income countries, including Uganda. The studies identified key challenges in transport and energy and research gaps in the target countries and determined a prioritised research agenda that can facilitate the transition to low-carbon transport.</p>	
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EXECUTIVE SUMMARY

The objective of this scoping study is to identify the key challenges in the transport sector in Uganda, as well as the potential research priorities that would facilitate the transition to low-carbon transport (LCT). The transport sector is one of the fastest growing sectors in the country and makes a direct contribution to GDP, ranging between US \$0.5 and \$0.9 billion per annum, and averaging 3.1 percent for the period 2008 – 2016 (NPA, 2020). The sector has contributed to the country's economic growth, promoting rapid urbanisation and increased motorisation.

The lack of a reliable public transport system in Kampala City and the Greater Kampala Metropolitan Area (GKMA) is a major constraint, and the cause of traffic congestion resulting in prolonged travel times, high vehicle operating costs, and air pollution. It also results in high costs of undertaking business and is a disincentive to investors. The Government of Uganda (GoU) is committed to promoting LCT, as reflected in its transport policies and plans as well as through stakeholder interviews.

The scoping study started with a literature review followed by interviews with selected stakeholders drawn from GoU, research institutions, development partners, industry and civil society. Finally, a stakeholder workshop was held with the objective of prioritising research questions, identifying key projects and programmes, and understanding the capacity of the local academic community to undertake LCT Research.

The scoping process identified clear demand for LCT research in Uganda, which will among other things demonstrate the socio-economic and environmental benefits of greening transport and contribute to an enhanced living environment for citizens.

The four priority research themes are presented below.

Diversifying inter-modal transport options for LCT in Uganda (Theme 1)

Uganda's transport system depends on roads to move over 90% of freight volumes to and from the ports in the region. In a bid to reduce over dependence on road transport, the Government has reaffirmed the need for multi-modal transport. In this regard, efforts are underway to revive transport on Lake Victoria as well as to upgrade rail transport services. This will have a positive impact on the environment in terms of achieving a net reduction in GHG emissions.

Relevant questions to be addressed under this theme include:

- What are the inland waterway and rail routes in Uganda and with its neighbours that have the highest potential to shift freight away from roads?
- What impact would these alternative transport modes have on GHG emissions?

Monitoring of GHG emissions in Uganda (Theme 2)

The extent of the vehicle emissions and their impact has not been adequately researched, with the exception of the work of Makerere University. The Makerere research used satellite imagery to show a correlation between air pollution and traffic hotspots such as the taxi parks and major junctions. In addition, a recent review of the National Transport Policy showed some legislative gaps in terms of regulating harmful emissions such as carbon dioxide, carbon monoxide, hydrocarbons and nitrogen oxides. Research in this area would be timely given that Uganda will soon become an oil producer with refining capacity to meet national and regional needs.

Relevant questions to be addressed under this theme include:

- Identifying the type of data required for emissions tracking and the investment required and the institutional arrangements for the data collection exercise?



- Using international best practice, measure transport related greenhouse gas emissions and noxious gases from vehicles, focusing main routes and urban centres.
- Based on transport and traffic models, and on economic development projections, build future transport emissions scenarios.
- Identify trends related to the transport sector and inform policy makers on the potential options to achieve significant reduction.

Fostering an electric vehicle market and industry (Theme 3)

Uganda's state-owned car maker, Kiira Motors Corporation, has successfully tested the first locally assembled electric bus called Kayoola, which is targeted for mass transport. Kiira plans to start production of the Kayoola e-buses in 2021 at the Jinja plant that is under construction under the Eco-Bus Pilot Project. GHG emission reductions can also be achieved through the use of e-bikes. There are at least three start-ups in the Uganda looking into investing in e-bikes.

Relevant questions to be addressed under this theme include:

- What is the potential of electric motor bikes and cars being introduced in Uganda to replace the fossil fuelled vehicles, and what would the result in terms of economic impacts and reduced GHGs?
- What steps are needed to attract private sector involvement and foster markets for electric vehicles?
- What charging infrastructure and parking facilities will be required to support the introduction of electric vehicles in Uganda?
- What lessons are there to learn from other countries in the region that have made advances with electric vehicles?

Assessing the socio-economic impacts of mass transport systems in Kampala (Theme 5)

There are serious congestion problems in the capital city Kampala as well as the roads leading to and from the wider GKMA. This is due to the rapid urbanization that has taken place over the last 20 years as well as a dysfunctional public transport system, which has led to a larger than normal use of the 14-seater minibus taxis and smaller vehicles characterised by low occupancy. *Boda bodas* have grown exponentially in numbers. At the same time, many Ugandans perceive driving private cars to be a status symbol.

Traffic jams, and at times total gridlocks occur in the city at peak times with the associated economic losses and high levels of GHG emissions per capita. A 2017 World Bank study estimated that traffic jams are costing Uganda over US\$ 800 million in lost GDP.

Relevant questions to be addressed under this theme include:

- What are the socio-economic impacts of introducing mass transport systems in Uganda including the appropriate mitigating measures?
- What are the political economy issues that could potentially hinder the implementation of BRT and other forms of mass transit?

How can the middle-class be encouraged to use mass transport systems?



1. Introduction

1.1 Background

The United Kingdom's Department for International Development (DFID)'s High Volume Transport (HVT) and Energy and Economic Growth (EEG) applied research programmes share common elements regarding transport and energy. IMC Worldwide (IMC) leads the HVT programme, while Oxford Policy Management (OPM) leads the EEG programme.

The EEG research programme examines links between energy and economic growth, working closely with policy makers in Sub-Saharan Africa and South Asia to build more sustainable, efficient, reliable and equitable energy systems. EEG research areas cover efficient and productive energy use, reliability, renewable energy and grid access.

In contrast, the HVT research programme aims to make transport safer, greener, more affordable, accessible and inclusive in low-income countries (LIC). The HVT research priority areas include climate mitigation and adaptation, inclusion, gender and road safety, policy and regulation, technology and innovation, fragile and conflict-affected states and research uptake and capacity building.

The two programmes have joined forces to undertake a scoping exercise to examine low carbon transport (LCT) and energy research priorities in the low- and middle-income (LIC/MIC) countries of Bangladesh, Nepal, Pakistan Uganda and Zambia. This joint IMC/OPM scoping exercise will maximise commonalities between the HVT and EEG programmes.

1.2 Objectives

The overall objective of the transport scoping exercise is to contribute to the transition to LCT in LIC/MIC in Asia and Sub-Saharan Africa by meeting research needs and enhancing knowledge and capacity in the areas of transport.

The transport scoping exercise will identify key challenges in transport and energy, research gaps in the target country and determine a prioritised research agenda that can facilitate the transition to LCT.

The follow key questions will guide the scoping exercise in each country.

1. What are the key challenges to LCT in each country?
2. What type of research activities are being undertaken to assist address these challenges?
3. Which actors/organisations/research institutes are best placed to undertake this research?
4. Who are the main beneficiaries of such knowledge/research?

1.3 Research needs matrix

Sustainable mobility can be defined as **Accessible, Affordable, Safe, Green and Inclusive (AASGI)**. The HVT Programme developed a matrix based on these key elements which lists the main actions or 'enablers' that allow these to be achieved in practice.

The AASGI matrix (see Table 1) is used in this scoping exercise to categorise transport knowledge gaps and prioritise transport research needs in the five countries. It identifies which key elements of sustainable mobility require further research and capacity building.



Table 1: AASGI matrix

Key Enablers	Accessible	Affordable efficient	Safe	Green	Inclusive
Policy, planning and regulations <i>Evidence based policy formulation and promulgation. Proactive, equitable and informed planning, and regulation of transport services.</i>					
Finance and economics <i>Access to infrastructure finance including private finance through Public-Private Partnerships (PPP) and similar structures. Understanding of economics around specific transport challenges</i>					
Governance and Institutions <i>Institutional changes that lead to improved capacity and efficiency, understanding and improving governance structures, and influencing behavioural change e.g. through the anthropology perspective.</i>					
Technology <i>Access to innovation and technology, and their impact on transport.</i>					
Data <i>Application, sources, and importance of big data in providing evidence for improved transport services.</i>					
Operations, service and management <i>Including day to day activities in public transport provision excluding construction of capital infrastructure.</i>					
Infrastructure <i>Including provision of physical assets, construction and engineering.</i>					

1.4 Country focus

The HVT/EEG collaboration will focus on Bangladesh, Nepal, Pakistan, Uganda, and Zambia. In addition, work will be undertaken in China and India that will complement this study.

The current report relates to the scoping carried out in Uganda in December 2019.



2. Transport sector context

Uganda is a landlocked East African country. It is also a transit country for its neighbours: Burundi, Democratic Republic of Congo (DRC), Rwanda, and South Sudan.

Uganda's main trade artery is the Northern Corridor, which starts from the Kenyan port of Mombasa and moves through the border towns of Malaba and Busia to Kampala via Jinja. The alternative route to the sea is the Central Corridor that has its origin at the Port of Dar-es-Salaam (Tanzania).

Uganda has a total surface area of 241,550 square kilometres (sq km), of which one-fifth is covered with water or swamp. Uganda has a fast-growing population of approximately 40.8 million people.

Kampala, the capital city of Uganda, has a population of two million. It is estimated that an additional two million people come into the city from the Greater Kampala Metropolitan Area (GKMA) during the day for work and other activities. The GKMA, which includes the districts of Kampala, Mukono, and Wakiso, is the main centre of economic activity within Uganda. It comprises an urban area of 970 sq km located within 20 km of Kampala City. It represents a third of the Gross Domestic Product (GDP), and hosts 46% of formal employment in the country.

The Bank of Uganda predicts that Uganda's economy will continue its robust recovery, that started in 2017/18 with growth between 5%–5.5%, with projected growth of 5-6% for 2020 (BOU, 2019). This is in part due to the recovery of the agriculture sector, the sustained growth in services, and ongoing infrastructure investments. This projection remains subject to risks stemming from uncertainties in the global economy.

Although the economy is growing, it is not creating enough quality and gainful jobs, especially for younger people, and unemployment is estimated at 13.3%. About 78% of the population is aged 30 years and below (NPA, 2020). The National Development Plan-III (NDP-III), which covers the period 2020/21 to 2024/25, has a projected economic growth rate of 7% over the plan period. GDP per capita is expected to reach US \$1,301, putting the country into middle-income status. The goal of NDP-III is to "increase household incomes and improve the quality of life of Ugandans".

Uganda is a signatory to the United Nations Framework on climate change (UNFCCC). Under the 2015 Paris Agreement, all parties are committed to submitting nationally determined contributions (NDCs) to reduce greenhouse gas (GHG) emissions.

2.1 Key trends

Transport is one of the fastest growing sectors in the country. Between 2008 and 2016, the sector made a direct contribution to GDP of between US \$0.5 and \$0.9 billion per annum, averaging 3.1 percent (NPA, 2020). The sector has contributed to the country's economic growth through the promotion of rapid urbanisation and increased motorisation.

Registration of new vehicles is conducted by the Uganda Revenue Authority (URA) for private cars, while the Ministry of Works and Transport (MoWT) registers government-owned cars. Licenses of vehicles for public use are issued by the Transport Licensing Board (TLB). The motorised vehicle fleet increased by 83% from 739,036 in 2012 to 1,355,090 in 2018, of which 50% are estimated to be in the GKMA. The vehicle fleet is dominated by vehicles that are over 12 years old. Motorcycle taxis, known locally as boda bodas, increased by 192% from 354,000 in 2010 to 1.034 million in 2018 (NPA, 2020). It should be noted that newly registered motor vehicles and motorcycles are either second hand (used) or brand new. The majority are currently second hand.

With regard to urbanisation, Parliament has elevated nine municipalities to city status, five of which will become operational in July 2020 (Mbewa, 2019). These cities are Arua, Fort Portal Gulu, Jinja, and Mbarara. The cities will join Kampala, which is currently the only city in the country. The development of new cities is an opportunity to ensure properly planned, green, inclusive cities with a low-carbon footprint.



Figure 1: Uganda’s road network



The current public transport system is composed of 14-seater public service vehicles (taxis) and boda bodas. The lack of a reliable public transport system in Kampala City and the GKMA is a major constraint, and a cause of traffic congestion, resulting in prolonged travel times, high vehicle operating costs, and air pollution. It also contributes to the high costs of undertaking business and is a disincentive to investors. For instance, to travel the 80 km distance between Jinja and Kampala used to take less than one hour. Today, it takes three-to-four hours to complete the same journey.

A 2017 World Bank (WB) study estimated that traffic jams are costing Uganda over US \$800 million in lost GDP (Mugisa, 2017). The MoWT has prepared a memorandum for Cabinet on measures to reduce the traffic congestion in the GKMA.

It is worth noting that Uganda has achieved significant improvement in the WB’s Ease of Doing Business rankings over the past five years, moving from 135th position in 2015 to the current 116th. Despite this progress, there remain financial and logistical impediments (NPA, 2020).

According to Uganda’s First Biennial Update Report to the UNFCCC (2019), the transport sector accounted for approximately 66% of the country’s total energy-based emissions. Due to the role that transport plays in the country’s emission profile, the sector is the focus of Uganda’s NDC as well as the Uganda Green Growth Development Strategy (UGGDS) (2017/18–2030/31).

Current priorities of GoU in the transport sector include regulation of the transport system, investment in physical infrastructure, and improvement of public transport.



2.2 Key sector entities

The MoWT is the lead institution for the transport sector. It consists of eight departments under the Directorate of Engineering and Works and the Directorate of Transport. The mandate of MoWT is to:

- plan, develop and maintain an economic, efficient and effective transport infrastructure;
- plan, develop and maintain economic, efficient and effective transport services by road, air, rail and water;
- manage public works including Government Structures; and
- promote good standards in the Construction Industry.

In addition to the MoWT, the sector is composed of a number of key entities. These are listed below along with brief descriptions of their respective roles as detailed in the National Transport and Logistics Policy and Strategy:

- The Uganda National Roads Authority (UNRA) is mandated to develop and maintain the national road network as shown in Figure 1 (UTEXAS, 2005).
- The Uganda Road Fund (URF) is responsible for funding road maintenance.
- Kampala Capital City Authority (KCCA) oversees road development and maintenance in the Capital City as well as public transport planning.
- The Transport Licensing Board (TLB) is responsible for the licensing of road transport vehicles and drivers.
- The National Road Safety Council (NRSC) is the lead agency for road safety.
- The Uganda Railways Corporation (URC) is responsible for the development and operations of railways.
- The Civil Aviation Authority (CAA) is the regulator and operator of the main airports.
- The Engineers Registration Board (ERB) regulates and controls engineers and their activities in Uganda.
- East African Civil Aviation Academy handles the training of pilots and aircraft crew.
- Uganda Air Cargo Corporation provides, develops and operates air transport services.

Other Ministries, Departments and Agencies with responsibilities in the transport sector are:

- Ministry of Finance, Planning and Economic Development (MoFPED)
- Ministry of Local Government (MoLG)
- Ministry of Lands, Housing and Urban Development (MoLHUD)
- Urban Authorities
- District Local Governments
- Uganda Revenue Authority (URA)
- Uganda Police – Directorate of Traffic and Road Safety
- National Planning Authority (NPA)
- Ministry of Water and Environment (MoWE)

2.3 Policy context

In 2009, the MoWT published the National Transport Master Plan which includes a Transport Master Plan for the Greater Kampala Metropolitan Area (2020-2023). The primary objectives of the National Transport Master Plan (MoWT, 2009) are to (1) serve as a long-term reference framework for developing plans for individual transport modes; (2) provide key input to the overall national planning process; (3) create a framework for investment decisions for both the private and public sectors; and (4) create a high-quality transport planning capacity within the MoWT. Additionally, it addresses wide-ranging topics such as the environment and land use-related issues.

The second Transport Master Plan is under preparation with funding from the European Union (EU). The plan will address better strategic transport planning, and will provide recommendations on



investment priorities, including measures needed to support economic growth, and the living conditions of citizens.

The plan will provide guidance on where and how the country's transport infrastructure and services (covering roads, railways, inland waterways and air transport) should develop from 2021 to 2040. Sustainability measures will be high on the agenda of the new Transport Master Plan, in line with the strategic directions of the NDP-III, Vision 2040 and the UN Sustainable Development Goals (SDGs).

New sector policies have been formulated and existing policies reviewed. Table 2 summaries the status of key transport policy and legislation as presented in the fifteenth Joint Transport Sector Review held in September 2019 (MoWT, 2019).

Table 2: Status of transport policy and legislation

	Description	Status/Progress	Responsibility
1	Roads Bill 2018	The Roads Bill 2018 was passed by Parliament in May 2019. Once assented to by the President, the Bill will ease regulation of matters related to planning, construction and management of public roads. This includes the improved control of the usage of road reserves, provision of pedestrian crossings, footways and cycle lanes, effective control of traffic, and the introduction of road tolls as an off-budget source of financing for road infrastructure development projects.	MoWT
2	National Transport and Logistics Policy and Strategy (NTLPS), 2018	Preparation of the Regulatory Impact Assessment (RIA) has commenced	MoWT
3	Inland Water Transport Bill, 2019	Bill cleared of both financial implications and legal compliance. Commenced preparation of RIA report and Cabinet Memo for submission to Cabinet	MoWT
4	Traffic and Road Safety (Amendment Bill, 2018)	Cabinet approved the Bill in December 2018. It is now before the Physical Infrastructure Committee of Parliament.	MoWT
5	National Railway Transport Policy	Draft Final Report for the Policy under review by the Technical Team. Preparation of RIA to start.	MoWT
6	National Aviation Transport Policy	Draft Policy under review by the Technical Team.	MoWT
7	Non-Motorised Transport (NMT) Policy	The policy which seeks to prioritize alternative modes of transport was approved in 2012 with support from United Nations Environment Programme (UNEP). The design manual for NMT was completed in December 2019.	MoWT

To address environmental concerns from the transport sector, Uganda's 2015 National Climate Change Policy (NCCP) and its NDC both recognise the need to reduce GHG emissions and to ensure climate resilient transport infrastructure.

NDP-III will identify areas for exploiting the potential for low-carbon development in line with the NCCP



and the UGGDS for the period 2017/18–2030/31. The climate priorities for Uganda’s transport sector include gradually shifting to less carbon-intensive fuels and promoting transport modes that take into account GHG emissions reduction.

The UGGDS has five focus areas that have the highest green growth potential in terms of investments and contribution to national development goals and targets (NPA, 2017). One of these focus areas is sustainable transport, which highlights multi-modal and mass transport systems for urban areas. Another area is the development and interconnectivity of planned national and regional transport networks.

Implementation of the UGGDS is envisaged to generate eight development outcomes by 2030, including income and livelihoods enhancement, decent green jobs, and climate change mitigation and adaptation.

A study carried out by the EPRC in collaboration with the Global Green Growth Institute, and the MoFPED, indicates that green growth in Uganda could increase GDP by around 10% and reduce GHG emissions by 30% by 2040 compared to business as usual (Guloba, 2016).

Some of the current climate change response initiatives include creation of an updated inventory of sectoral GHG emissions, preparation of various Nationally Appropriate Mitigation Actions (NAMAs), and an environmental tax on high-polluting old vehicles. In addition, the Government has banned the importation of vehicles aged above 15 years in order to reduce transport sector GHG emissions.



3. Transport supply and demand

Uganda's transport system is divided into four sub-sectors: (1) road transport; (2) rail transport; (3) maritime/water transport and (4) air transport. These modes collectively comprise the country's transport system. The overall goal of the transport programme in NDP-III is to develop a seamless, safe, inclusive and sustainable multi-modal transport system.

The MoWT is focused on operating an efficient transport network to support economic development. In the financial year (FY) 2018/19, Parliament allocated a total budget of Uganda Shillings (UGX) 4,789.62 billion (USD \$1.3 billion) to the Sector, with an allocation of UGX 712.87 billion (USD \$194.5 million) (15%) and UGX 4,073.75 billion (USD \$1.1 billion) (85%) for recurrent and development expenditure respectively. The Ugandan Government will contribute UGX 2,791.59 billion (USD \$761.9 million) (58%), while Development Partners will contribute UGX 1,995.03 billion (USD \$544.5 million) (42%) of the total budget. The sector budget for the FY 2019/2020 increased to UGX 6,400 billion (USD \$1.75 billion) (MoWT, 2019). It should be noted that this is the biggest budget allocation compared to other sectors.

Current transport sector financing arrangements, however, are inadequate to meet all needs and therefore unsustainable. It has been recognised that future financing of the sector will need to draw upon alternative sources, including PPPs. In addition, it will be important to address the requirements to ensure Uganda is eligible for accessing climate finance from the various climate finance windows.

3.1 Road transport

Road transport is the dominant mode of transport carrying over 90% of goods and passenger traffic. The road network falls into four categories: national, district, urban and community access roads. The total road network is estimated to be 129,469 km long. Of this, community access roads constitute 50%, district roads 26%, urban roads 7% and national roads 17%. By 2018, the national road network was 25% paved and 75% was unpaved (see Table 3). The UNRA manages the national road network.

Table 3: National road network in Uganda (km) 2015/2016 - 2018/2019

	2015/2016	2016/17	2017/18	2018/19
Total Paved	4,157	4,257	4,551	5,016
Percentage change - Paved	6	2.4	6.9	10.2
Total unpaved	16,387	16,287	15,993	15,840
Percentage change - Unpaved	-1	-0.6	-1.8	-1
Total National Network	20,544	20,544	20,544	20,856

Source: Uganda National Roads Authority (UNRA)

The road sub-sector continues to take the largest part of the budget allocated to the transport sector. In FY 2019/20, 400 km equivalent of national roads will be upgraded from gravel to tarmac, and 58 bridges will be constructed on the national road network. This includes strategic roads to support the exploitation of minerals, oil and gas, as well as tourism activities. Another 332.4 km equivalent of national roads will be rehabilitated. The target is to maintain 80% of the national road network in fair to good condition.

The Northern Corridor, which is the principal road artery in Uganda, is in fairly good condition, except for the section between Jinja and Kampala. As mentioned in Section 2.1, travel times on this part of the Corridor are slow due to traffic congestion and poor road conditions, caused in part by overloading of heavy goods vehicles. This is a cost to the economy and detrimental to the environment in terms of GHG emissions. The solution to the traffic congestion and rapid deterioration of the road infrastructure on this section being considered is the construction of the Kampala–Jinja expressway (KJE) under a PPP arrangement.

More generally, the Northern Corridor Secretariat with support from the UNEP and the United Nations



Conference on Trade and Development (UNCTAD) adopted a Green Freight Strategy in 2017 aimed at reducing vehicle emissions, improving road safety and improving vehicle fuel efficiency (NCS, 2017).

3.2 Rail transport

The railway transport network in Uganda extends for 1,260 km. The Uganda rail track is a meter-gauge¹. A total of 818,520 tonnes of mixed cargo was hauled in 2015 compared to 682,800 tonnes in 2014, representing an increase of 19.9%. Management of the railway network falls under the URC in accordance with the Uganda Railway's Act (1992).

Specific actions taken to address the low operational coverage of railway transport services include:

- the rehabilitation of the Tororo – Gulu Meter Gauge Railway line and rolling stock;
- detailed design and procurement of a civil works contract for the construction of the Gulu Inland Container Depot (ICD);
- commencement of the feasibility study to evaluate the potential and cost of having an urban commuter rail service along the existing network and corridors; and
- land acquisition and payment of compensation to project affected persons (PAPs) for the planned implementation of the Kampala – Malaba Standard Gauge Railway (SGR) Project. The SGR once implemented will allow for higher operational speeds and integration of regional railways. There are also plans to introduce electric locomotives on the SGR.

Government has introduced measures for promoting a modal shift from road to rail. This included capping the national roads development budget to 70% of the 2019/20 total in order to encourage non-road transport modes. It is the combination and optimisation of transport modes that will render Ugandan goods and services competitive and environmentally sustainable.

3.3 Maritime/water transport

Inland waterways are mainly managed by both URC and UNRA. Water transport is relatively under-developed in Uganda. The absence of modern vessels, railway connections, and cargo handling facilities at ports has hampered the use of inland waterways for the transport of goods and passengers. Uganda is now moving to revive transport and trade on Lake Victoria between the neighbouring countries of Kenya and Tanzania. The three East African countries are improving ports and rail links, rehabilitating ships and wagon ferries, and enhancing inland water transport safety.

The wagon ferry routes are Port Bell – Mwanza and Port Bell – Kisumu. These also connect to the rail network. A key project in NDP-III is the development of Bukasa Port near Kampala, which will operationalise lake transport on the Northern and Central Corridors.

3.4 Air transport

Air transport in Uganda plays an increasingly important role in tourism and the import-export trade of perishable goods such as horticultural products, cut flowers and frozen fish. Air transport is dominated by Entebbe International Airport. There was a 6.1% increase in the total number of passengers passing through Entebbe International Airport from 1,549,495 (2016) to 1,644,702 (2017) (UBOS, 2018). The volume of cargo offloaded at Entebbe International Airport increased by 16.4% from 59,556 tonnes (2016) to 69,306 tonnes (2017) (Ibid).

The CAA, established in 1991, is mandated with both advisory and regulatory roles. A key development in the air transport sub-sector was the revival of the national air carrier in 2019. Operations to eight regional destinations have commenced using four short-haul aircraft. New international routes will be

¹ Metre-gauge railways are narrow-gauge railways with track gauge of 1,000 mm or 1 metre. The narrow gauge has limitations on load and speeds. Efforts are underway to upgrade parts of the network to standard gauge which is wider at 1,435 mm.



introduced in 2021 once the remaining two wide-body aircraft are delivered. Other key developments include the ongoing expansion of Entebbe airport and the construction of a new international airport in Hoima that will support the emerging oil and gas sector.

3.5 Non-motorised transport

The Multi-Modal Transport Master Plan for GKMA that was prepared in 2018 by the KCAA recommends the development of a comfortable, wide and safe NMT network connecting all parts of Greater Kampala. This includes segregated and well-marked walkways and cycle lanes. The Master Plan indicates that walking currently accounts for 46% of the trips above 1 km in Greater Kampala, while cycling accounts for only 2%. The plan also indicates that more than 2.5 million non-motorised transport trips are performed daily in the metropolitan area and that the number of trips is expected to increase to 8 million daily by the year 2040 (KCCA, 2018).



4. Key international development programmes

Donor coordination in Uganda takes place at the national and sectoral levels. The main aid coordination body at the national level is the Local Development Partnership Group (LDPG). At the sectoral level, the Works and Transport Sector Working Group meets bi-monthly and holds an annual Joint Transport Sector Review to assess progress on agreed commitments, and to identify constraints, challenges and solutions to sector performance.

The multilateral development partners actively supporting the transport sector in Uganda include the African Development Bank (AfDB), the EU, United Nations Development Programme (UNDP), and the World Bank. The bilateral partners are the UK, France, China, Germany, Japan, Canada, Sweden, and United States Agency for International Development (USAID).

It is worth noting that development partners are progressively directing their support to projects that contribute directly to achieving sustainability and efficiency in the sector. For example, the Kampala City Roads Rehabilitation Project, approved by AfDB in November 2019, has as one of its main objectives the enhancement of transport efficiency in Kampala. This will be achieved by expanding the road network and upgrading junctions to facilitate smooth traffic flow. The project also aims at improving air quality in the city through the implementation of scheduled eco-bus transit services, and promoting active transport by expansion of NMT networks, including walkways and cycling tracks in Kampala.

A total of 14 municipalities have benefitted from improved transport infrastructure, supported under the World Bank's project on Uganda Support for Municipal Infrastructure Development (USMID). Under this project, which has now entered its second phase, provisions have been made for pedestrian walkways and urban greening. The World Bank has also supported the development of the National Transport Master Plan, the National Transport and Logistics Policy and Strategy, and a pre-feasibility study for introducing bus rapid transit (BRT) in the GKMA.

Under its programme of assistance to Uganda, the EU focuses on transport infrastructure, by supporting the national transport system and an efficient multimodal transport network.

Projects supported by the EU include the ongoing Northern Bypass project and the planned Kampala – Jinja Expressway, in collaboration with AfDB and the French Development Agency (AFD). Both these projects, once completed, will complement the Kampala – Entebbe expressway, and significantly help improve traffic flows in and around the GKMA. In the rail sector, upgrading of the Tororo – Gulu line has commenced. In addition, the URC is revamping its passenger services in the GKMA with support from the EU.

Bilateral partners including DFID, Japan International Development Agency (JICA), and France are supporting government efforts to improve traffic flow in Kampala and to introduce sustainable public transport systems. JICA is financing the construction of three flyovers and road junction improvements. DFID and France are supporting the BRT.

UNDP has supported the development of a NAMA to promote sustainable development in the sector through the implementation of a Transport Greening NAMA. It includes the development of policies and regulations that will promote the adoption of cleaner and more fuel-efficient vehicle strategies. The NAMA proposes a viable long-term alternative to imported second hand vehicles, namely the establishment of local car assembly facilities that will supply low-cost localised car models. The NAMA contributes 13% to the road transport emission reduction potential, and 0.33% to the overall mitigation target of Uganda's NDC. Furthermore, the NAMA will also contribute to the achievement of the SDGs.



5. Challenges and opportunities

The Government of Uganda is committed to promoting LCT as reflected in its transport policies and plans, and through interviews with key stakeholders. The priority focus areas include the diversification of transport modes, development of urban mass transport and non-motorized transport (bicycles and walking), improvement of fuel efficiencies, reduction of GHG emissions from the transport sector, and promotion of cleaner vehicles. Each of these has its unique challenges that the government has already identified and is trying to address. Key challenges and opportunities are presented below.

5.1 Underutilisation of alternative and greener transport modes

Uganda is endowed with large internal waterways such as Lake Victoria, which is the second largest freshwater lake in the world. It is also at the source of the north-flowing River Nile, which is the longest in Africa. This is an opportunity to be seized in terms of LCT. Recent investment in the Northern Corridor at Kisumu port in Kenya has reignited interest in lake transport. At least two private developers are currently working on projects to move international cargo from Kisumu in Kenya to Port Bell in Uganda. There are also plans to develop public transport across the lake by ferries (Kamoga, 2018). Details are yet to be made public.

Light rail transport also has great potential for commuter traffic in GKMA. The passenger service being run by URC from Kampala to Namanve (17.1 km away) has been successful. URC has five refurbished coaches with a maximum capacity of 200 passengers, each of which runs four trips a day on this route. The cost to passengers is half of what is charged by the mini-bus taxis. This is made possible by a subsidy from Government to URC for passenger services. The EU is interested in supporting the extension of this service to the town of Mukono and other key routes, including park and ride facilities within the corridors. At the moment there is no project in the pipeline for an urban rail mass transit system of the type that has been introduced in Addis Ababa, Ethiopia.

Moving long-distance freight by rail is another area with potential. This will require infrastructure upgrades, some of which have started. The highly anticipated SGR, which would link with Kenya, has been delayed. The Government of Uganda as the developer is in negotiations for a loan from the China Exim Bank for this purpose. An electrified SGR once implemented would significantly lower GHG emissions.

5.2 Introduction of urban mass transport in the GKMA

In response to the challenge of traffic congestion, the focus has been on popularising mass transport within Kampala Capital City to ensure people use public transport instead of personal cars. This can help to reduce individual carbon footprints and ultimately the total carbon footprint for the transport sector. One of the recommendations of the National Transport Master Plan was that a BRT system be introduced to serve the GKMA. Pre-feasibility studies have been carried out, however, further preparatory work is required ahead of actual implementation.

A particular challenge is the narrowness of streets. Proposals to create special lanes for buses within Kampala have not been achieved because of poor city planning. Expansion of existing lanes and creating new ones will require land acquisition and the associated compensation to project affected persons.

Further, there is need to deal with potential resistance from the operators of the minibuses and boda bodas who would stand to lose business.

5.3 Inadequate facilities for non-motorized transport

Most of Uganda's roads have no infrastructure for dedicated use by pedestrians or cyclists. The needs of NMT are sometimes omitted from the designs of road improvements. Increasing motorisation, combined with some inadequately maintained infrastructure, has made NMT unsafe. However,



Government has shown support for NMT in recent actions. For example, NMT is being piloted in Kampala where the Namirembe road will be zoned exclusively for NMT.

5.4 Disconnect between land use planning and LCT

The current land use in the GKMA is characterised by a high volume of commuter trips but little consideration for greening transport. Under the Uganda National Urban Policy, new urban road projects now include walkways and cycle lanes as well as greening of road corridors (MoLHUD, 2017). This was not the case 10 years ago. A key issue in Uganda is land acquisition and the associated compensation that is required to be met prior to new developments. Road reserves (land on either side of the road set aside for future expansion) have been encroached upon both in urban and rural areas. This is where pedestrian walkways and cycle ways are typically located.

5.5 High contribution of current vehicle fleet to GHG emissions in Uganda

As a party to the UNFCCC, Uganda is required to periodically update and publish its inventory of the country's GHG emissions. This is facilitated by the Green House Gas Inventory Manual that was prepared by the Climate Change Department of the Ministry of Water and Environment in 2015 with support from UNDP (MoWE, 2019).

The World Health Organization (WHO) identified Kampala as one of the most polluted cities in the world in a 2018 global survey of 500 cities (WHO, 2018). Researchers found that vehicle emissions were the leading cause of air pollution. The average age of the national fleet is the highest in the region. In addition, there is a significant volume of transit traffic that uses the Ugandan road network along the Northern Corridor. The transit traffic is comprised mainly of 30 tonne diesel-run heavy goods vehicles.

With regard to enforcement of emission standards, the national environmental management agency (NEMA) is working on air quality regulations that will be ready for adoption in 2020. At the same time, the seven vehicle inspection centres in the country operated by SGS and the mobile units are expected to become fully operational in 2020 once the legal framework for the enforcement of emission standards is finalised. This is a gap given that there are no transitional arrangements in place. Implementation of the annual mandatory motor vehicle inspections when it finally starts will ensure that vehicles on the road are within the prescribed emission levels.

5.6 The future of electric vehicles, buses and e-bikes

Uganda's state-owned car maker, Kiira Motors Corporation (Kiira), has successfully tested the first locally assembled electric bus, called Kayoola, which is targeted for mass transport. Kiira plans to start production of Kayoola e-buses in 2021, at the Jinja plant that is being constructed under the Eco-Bus Pilot Project (KMC, 2019).

GHG emission reductions can also be achieved through the use of e-bikes. There are at least three start-ups in the Uganda looking into investing in e-bikes.

By 2021, Uganda is projected to have excess power once ongoing hydro and solar PV projects have been commissioned. By that time, the generation capacity will reach 2000 MW compared to the current requirement of 650 MW and installed capacity of 1200 MW. The priority now is to grow the demand side. This will be an opportunity for Uganda to shift to electric vehicles, buses and e-bikes, charged from renewable energy sources. Research will be required to show the potential demand arising from a shift to electric mobility as well as the required charging infrastructure and parking facilities.



6. Overview of the methodological approach

6.1 Interviews

The specific objective of the scoping study in Uganda was to identify key challenges and research gaps in the transport sector, and to determine a prioritised research agenda that can facilitate the transition to low-carbon transport. A total of 16 interviews were conducted in the period 9-12 December 2019. Table 4 outlines the principal stakeholders consulted during interviews. The sample of interviewees was drawn from government, research institutions, development partners, industry and civil society. Relevant technical staff also attended the interviews. The prompts that were used to get interviewees to share their views, from which research questions can be identified were as follows:

1. What are the key challenges that are making the implementation of low-carbon transport difficult to achieve in your country, and what research is needed to overcome these challenges?
2. What priority is given to reducing GHG in national/local decisions that affect transport?
3. How desirable is it to promote low-carbon transport over the coming years? Why is it important (or not) to promote this?
4. What knowledge is needed to overcome these challenges (e.g. developing capacity, and sharing knowledge/good practice/tools)?

Table 4: Interviewees

Institution	Name and Position
Ministry of Works and Transport	Eng. Sam Bagonza, Engineer-in-Chief Mr. Winstone Katushabe, Commissioner, Transport and Road Safety
National Planning Authority	Eng. George Bwanga, Head of Infrastructure and Planning
Uganda National Road Agency	Eng. Samuel Muhoozi, Director Roads and Bridges
Transport Licensing Board	Mr. Godfrey Onyango Matata, Chairman of the Board
Ministry of Energy	Mr. Moses Murengezi, Advisor to the Permanent Secretary
Kampala City Council Authority	Eng. Jacob Byamukama, Deputy Director Roads Management
Ministry of Lands, Housing and Urban Development	Mr. Arthur Abigaba, Urban Planner
Municipal Infrastructure Development Project (USMID)	Ms. Olive Nalugo, Civil Engineer
Economic and Policy Research Centre, Makerere University	Dr. Ezra Munyambonera, Senior Research Fellow
Department for International Development	Mr. George Kanyomozi, Deputy Programme Manager
African Development Bank	Mr. George Makajuma, Principal Transport Engineer
World Bank	Mr. Ivan Mwondha, Senior Transport Engineer
EU Delegation in Uganda	Mr. Jean-Baptiste Fauvel, Programme Manager
Kiira Motors Corporation	Mr. Paul Musasizi, CEO
Uganda Clearing Industry and Forwarding Association	Mr. Steve Kabuleta, Secretary General
Civil Society Coalition on Transport in Uganda (CISCOT)	Mr. Lawrence Ssengendo, Chairman



6.2 Workshop

As part of the transport scoping study, a workshop was organised and attended by key stakeholders from across the transport sector. The workshop was held on Friday 13th December 2019 from 9am to 1pm at the Golf Course Hotel in Kampala, Uganda. The objective of the workshop was to prioritise research questions, identify key projects/programmes, and to understand the capacity of the academic community to undertake LCT Research. The workshop was attended by 17 participants as listed in Appendix A.

The representative of the Permanent Secretary (PS) of the MoWT delivered an opening statement. In his statement the PS emphasised the importance of sustainable and low-carbon transport given the consequences of climate change. He assured participants that the MoWT will participate actively in the research programme on LCT that will be the outcome of this scoping study.

Following the opening session, a scene-setting presentation was made on the HVT programme and the rationale for scoping research needs for LCT. Participants were then divided into four groups and tasked with undertaking two exercises (see Workshop Documents in Annex C). In Exercise 1 participants discussed the set exercise questions and produced three key research questions considering challenges, research question/methodology and the main beneficiaries. The rapporteurs for each group shared the questions in a plenary. The objective of Exercise 2 was the prioritisation of the key research questions according to the AASGI matrix and a voting exercise. The completed research matrix is presented in Table 5.

Table 5: AASGI matrix with workshop results

	Accessible	Affordable & efficient	Safe	Green	Inclusive
Policy, planning and regulations	1	1		5	3
Finance and economics		2		2	1
Governance and Institutions	1	1		3	2
Technology		2	1	2	
Data	1			3	
Operations, service and management				4	
Infrastructure	1		1	1	1

Workshop evaluation

At the end of the workshop participants were invited to complete an evaluation form. Feedback was received from 13 of the 17 participants. Of the 13 respondents, eight were male and five female. The outcome of the evaluation is summarised below under the different questions posed.

1. **Reaction.** How would you rate the overall content of the workshop in the following areas? – 92% of participants scored the workshop as excellent against usefulness. 100% of participants scored the workshop as very good or excellent against relevance and 93% of participants scored the workshop as very good or excellent in respect of methods used.



2. **Learning.** Thinking about the overall topic of the workshop how much have you learned about understanding the research gaps in low carbon transport in your country? - 92% of the participants said that they learned more or much more than they expected.
3. **Outputs from the Workshop.** All of the participants agreed that the outputs from the workshop would address LCT needs and priorities in Uganda.
4. **Behaviour.** How likely are you to submit a research proposal for any of the suggested topics? - 85% of participants said that they were guaranteed to submit a research proposal. For those that responded in the affirmative, participants indicated particular interest in the research areas shown in Table 6 below.
5. **How likely are you to continue your relationship with the HVT programme in your research proposal/work?** - 100% of respondents said that they were highly likely or guaranteed to continue their relationship with the HVT programme.
6. **Reflection. What can we improve to make this process better in the future research scoping?** The majority of participants suggested that more time be allowed for discussion in future workshops. They also called for the creation of a platform to continue engaging a wide range of stakeholders including academia.

Table 6: Responses to Areas of Interest in LCT Research

<ul style="list-style-type: none"> - Perceptions on transition to low carbon transport systems - Technology and skills/knowledge gaps - Extent of the impact of vehicle emissions on low carbon transport - Impact of governance on carbon emission reduction - Training of transport stakeholders: Drivers, mechanics and operators - Legislation, policy, greening transport, infrastructure - Introduction of electric vehicles in Uganda - Electrification of mobility - Electrification of mass transportation in urban areas in Uganda - How transport infrastructure development can go on but still reduce emissions - Quantifying and investigating the impacts of carbon emissions in Uganda



7. Final research themes

This section outlines the research themes and relevant questions that emerged from the interviews and stakeholder workshop. A total of seven themes emerged from the thirteen research questions from the workshop as reproduced in Appendix C. The prioritisation was done through a voting exercise. The four themes are presented below in order of priority starting with the theme that received most votes.

7.1 Diversifying inter-modal transport options for low-carbon transport (Theme 1)

Uganda's transport system depends on roads to move over 90% of freight volumes to and from the ports in the region. In a bid to reduce over dependence on road transport, the Government has reaffirmed the need for multi-modal transport. In this regard, efforts are underway to revive transport on Lake Victoria as well as to upgrade rail transport services. These steps could have a positive impact on the environment in terms of achieving a net reduction in GHG emissions.

Relevant questions to be addressed under this theme include:

- What are the inland waterway and rail routes in Uganda and between its neighbours that have the highest potential to shift freight away from roads?
- What impact would these alternative transport modes have on GHG emissions?

7.2 Monitoring transport GHG emissions in Uganda (Theme 2)

The extent of the vehicle emissions and their impact has not been adequately researched, with the exception of the work of Makerere University. The Makerere research used satellite imagery to show a correlation between air pollution and traffic hotspots such as the taxi parks and major junctions. In addition, a recent review of the National Transport Policy showed some legislative gaps in terms of regulating harmful emissions such as carbon dioxide, carbon monoxide, hydrocarbons and nitrogen oxides. Research in this area would be timely given that Uganda will soon become an oil producer with refining capacity to meet national and regional needs.

Relevant questions to be addressed under this theme include:

- How do you address the lack of data on emissions including Identifying the type of data required for emissions tracking and the, investment required and the institutional arrangements for the data collection exercise?
- Using international best practice, measure transport related greenhouse gas emissions and noxious gases from vehicles, focusing main routes and urban centres.
- Based on transport and traffic models, and on economic development projections, build future transport emissions scenarios.
- Identify trends related to the transport sector and inform policy makers on the potential options to achieve significant reduction.

7.3 Fostering an electric vehicle market and industry (Theme 3)

Uganda's state-owned car maker, Kiira Motors Corporation, has successfully tested the first locally assembled electric bus called Kayoola, which is targeted for mass transport. Kiira plans to start production of the Kayoola e-buses in 2021 at the Jinja plant that is under construction under the Eco-Bus Pilot Project. GHG emission reductions can also be achieved through the use of e-bikes. There are at least three start-ups in the Uganda looking into investing in e-bikes.

Relevant questions to be addressed under this theme include:

- What is the potential of electric motor bikes and cars being introduced in Uganda to replace the fossil fuelled vehicles, and what would the result in terms of economic impacts and reduced GHGs?



- What steps are needed to attract private sector involvement and foster markets for electric vehicles?
- What charging infrastructure and parking facilities will be required to support the introduction of electric vehicles in Uganda?
- What lessons are there to learn from other countries in the region that have made advances with electric vehicles?

7.4 Assessing the socio-economic impacts of mass transport systems in Kampala (Theme 4)

There are serious congestion problems in the capital city Kampala as well as the roads leading to and from the wider GKMA. This is due to the rapid urbanization that has taken place over the last 20 years as well as a dysfunctional public transport system, which has led to a larger than normal use of the 14-seater minibus taxis and smaller vehicles characterised by low occupancy. Boda bodas have grown exponentially in numbers. At the same time, many Ugandans perceive driving private cars to be a status symbol.

Traffic jams, and at times total gridlocks occur in the city at peak times with the associated economic losses and high levels of GHG emissions per capita. A 2017 World Bank study estimated that traffic jams are costing Uganda over US\$ 800 million in lost GDP.

Relevant questions to be addressed under this theme include:

- What are the socio-economic impacts of introducing mass transport systems in Uganda including the appropriate mitigating measures?
- What are the political economy issues that could potentially hinder the implementation of BRT and other forms of mass transit?
- How can the middle-class be encouraged to use mass transport systems?



8. Local capacity for research on LCT in Uganda

In the course of carrying out the study three institutions with capabilities of conducting research in LCT were identified. These are listed below with a brief description of their mandates and areas of focus:

The Economic Policy Research Centre (EPRC) – Makerere University

EPRC was established in 1993 and is Uganda's leading think tank in economics and development policy research and policy analysis. It provides policy analysis to support the formation, implementation, monitoring, and evaluation of government policies. EPRC has also broadened its scope and repositioned itself to respond to emerging development issues beyond Uganda through evidence-based research. EPRC's areas of work include green growth and urban planning.

Examples of research-based policy briefs produced by EPRC include:

- Private Public solutions to the boda boda menace
- How should Uganda finance infrastructure development?

Civil Society Coalition on Transport (CISCOT)

CISCOT is a coalition of 25 member organizations each with its own skills and competencies set with its human resource capacity. It has highly qualified personnel from diverse professional backgrounds in research, and aims to contribute to an efficient, effective and safe transport system. It brings together organizations to harness the potential of civil society and to build a strong, collective voice to address the needs and concerns of citizens on transport issues.

CISCOT is part of the following bodies of relevance to the proposed research:

- National Transport Sector Working Group.
- National Steering Committee for Capacity Building for the Transport Sector.
- National Annual Joint Transport Sector Monitoring and Evaluations Team.
- National Annual Joint Sector Policy Review Conferences; where CISCOT makes policy statements on behalf of civil society.
- Board Climate Action Network (CAN) Uganda.
- Team that negotiates and leads negotiation agenda for the country on UNFCCC and Paris agreements, legislations and policy reforms in areas of climate change and Environment.

The Secretariat has built capacity to undertake research and provides regular feedback at the annual Joint Transport Sector Review meetings.

The College of Engineering, Design, Art and Technology (CEDAT) – Makerere University

CEDAT is mandated to teach and undertake research in transportation technologies among other subjects. The vision of the project is to be at the forefront of research and development of green transport technologies in Africa, while its mission is to carry out research aimed at the development of cost effective and environmentally friendly transport technologies for Africa.

CEDAT aims to build a two-seater electric vehicle, named Kiira, as proof of concept, while developing a hybrid public transport Vehicle (Omni-bus), and establishing itself as a Centre of Excellence in Transport Research.

Further engagement with the above institutions could be undertaken in the future.



8.1 Participation of local counterparts in the research

Stakeholder interviews indicated that exposure and knowledge sharing are critical to Ugandan policy makers, planners, engineers and other key stakeholders. Lessons learned from other countries with similar conditions could be of particular benefit. Knowledge in the planning, design, promotion, and maintenance of low-carbon transport systems was requested, as well as the related behavioural change aspects.

Additionally, the interviewees requested to be involved in the proposed research to ensure ownership of findings as well as to facilitate knowledge transfer. Counterparts will be provided by the relevant Ministries, Departments and Agencies (MDAs) as well as the private sector, non-governmental organisations (NGOs), and civil society organisations.

Finally, it will be important to have a capacity building strategy for the institutions that will be responsible for the uptake and implementation of the research findings. The MoWT offered to take a lead role in coordinating research in the transport sector in general, and the uptake and delivery of the LCT research programme in particular, in liaison with relevant stakeholders.



9. Summary

This scoping report has been aimed at identifying key challenges in the transport sector in Uganda and proposing a prioritised research agenda that can facilitate the transition to a LCT. The methodology employed was a combination of a literature review, structured interviews with relevant stakeholders and a workshop to consider and select the highest ranked research themes.

Using the outcome of the interviews and workshop, it has been possible to identify seven recommended research themes as listed below in order of priority:

- Institutional arrangements for transitioning to LCT (Theme 1)
- Diversifying inter-modal transport options for LCT in Uganda (Theme 2)
- Monitoring of GHG emissions in Uganda (Theme 3)
- Exploiting the potential of electric vehicles (Theme 4)
- Innovation in reducing vehicle trips (Theme 5)
- Understanding the socio-economic aspects of LCT (Theme 6)
- Understanding the economic benefits of LCT (Theme 7)

The main takeaway from the scoping exercise is that there are a number of knowledge gaps that need to be filled to facilitate the transition to LCT in Uganda. Secondly, there is sufficient awareness and support for an applied research agenda. Finally, it will be important to have a capacity building strategy for the institutions that will be responsible for the uptake and implementation of the research findings.



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Appendix A: List of Workshop Participants



No.	NAME	ORGANISATION	POSITION
1	Mr. Papius Tibihika	National Environment Management Authority (NEMA)	Senior Research Coordinator
2	Mr. Henry Ndinaiwe	Civil Society Coalition on Transport (CISCOT) in Uganda	Executive Director
3	Ms. Winifred Adoch Gena	Ministry of Works and Transport (MoWT)	Senior Sociologist
4	Mr. Allan Muhumuza	Kiira Motors Corporation (KMC)	Business Development Manager
5	Ms. Thatcher Nakimuli	Kiira Motors Corporation (KMC)	Senior Product Designer
6	Mr. Elias Bwambale	Kiira Motors Corporation (KMC)	Senior Legal Officer
7	Eng. Winifred Naluginda	Ministry of Works and Transport (MoWT)	Assistant Commissioner Mechanical Inspection
8	Eng. Wilfred Okello	Ministry of Works and Transport (MoWT)	Commissioner Construction Standards and Quality Management
9	Mr. Arthur Abigaba	Ministry of Lands, Housing and Urban Development	Urban Development Officer
10	Mr. Richard Baguma	Civil Society Coalition on Transport (CISCOT) in Uganda	Public Relations and Communications Officer
11	Ms. Immaculate Nyanzi	Ministry of Works and Transport (MoWT)	Inspector of Vehicles
12	Mr. Byron Kinene	National Logistics Platform/Private Sector Foundation of Uganda	Committee Chairman
13	Ms. Evelyn Ahabyona	National Planning Authority (NPA)	Senior Planner, Works and Transport
14	Eng. Kharim Kibuuka	Ministry of Works and Transport (MoWT)	Principal Inspector of Vehicles
15	Mr. Anthony Wolimbwa	Civil Society Coalition on Transport (CISCOT) in Uganda	Technical Advisor, Environment
16	Mr. Ivan Mwondha	World Bank Group	Senior Transport Specialist
17	Ms. Amanda Ngabirano	Makerere University, Kampala	Lecturer, Urban Planning
18	Mr. Alex Rugamba	IMC Worldwide	Lead Researcher
19	Mr. Julius Kintu	IMC Worldwide	Assistant Researcher





Appendix B: Detailed Workshop Agenda



HIGH VOLUME TRANSPORT (HVT) SCOPING WORKSHOP ON

LOW CARBON TRANSPORT CHALLENGES IN UGANDA

13TH DECEMBER 2019, KAMPALA

Golf Course Hotel – 09h00 to 12h00

AGENDA

- 1. Welcome and introductions**
- 2. Opening Statement – Ministry of Works and Transport**
- 3. Identifying key research areas**
- 4. Prioritisation of key research questions**
- 5. Summary and future opportunities**

Lunch invitation to all participants



Appendix C: Workshop Documents



Exercise 1

Objective: *To determine research projects that will assist in the transition to low carbon transport in Uganda*

- Divide into four groups of 5-7 individuals per group
- Each groups should:
Nominate a rapporteur
Discuss the exercise questions
Produce 3 key research questions considering: challenges, research question/methodology, beneficiaries.
- Share questions with everyone in a plenary

Exercise 2

–prioritisation and categorisation of research projects/questions

This exercise will focus prioritising the provisional list of research projects:

- *Which project are the most important?*
- *Which project could have the greatest impact?*

The group will be asked to collectively prioritise the provisional list of questions. This will be through an interactive discussion or via an activity (each group ordering list of questions by using stickers on a common chart).

The group will be presented with the AASGI matrix.

Each group will be given three/four questions to consider and to categorise according to the matrix.

Each group using stickers will then place their stickers on a common matrix each numbered question.

The aim of this exercise is to get an idea of the themes considered in the questions and to generate a 'heat map' of research needs.



AASGI MATRIX

	Accessible	Affordable & efficiency	Safe	Green	Inclusive
Policy planning & regulations	•	•		••••	•••
Finance & Economics		••		••	•
Governance institutions	•	•		•••	••
Technology		••	•	••	
Data	•			•••	
Operations Services & management				••••	
Infrastructure	•		•	•	•

RESEARCH QUESTIONS

1	1. What policy gaps are there in unlocking low carbon transport systems? (How do we get political leaders to respect policy implementation?)	10
	2. What is the impact of Landuse planning on low carbon transport systems in Uganda?	7
	3. Is there a relationship b/w stakeholders capacities and low carbon emissions in the transport sector?	7
2	4. Investigate alternative transport modes.	11
	5. What are the constraints of policies towards formulating or articulating low carbon transport system?	11
	6. To investigate/quantify carbon or other emissions.	10
3	7. What measures can be put in place to address the knowledge gap issue (short term, mid term, long term)?	7
	8. How can relevant sectors & institutions synergise their strategic interventions to achieve low carbon transport in Ug?	12*
	9. What strategic interventions can be put in place to facilitate the dev't of integrated infrastructure for uptake of low carbon trans?	8
4	10. How best can inadequate political will towards enforcing regulatory measures aimed at achieving low carbon trans. be addressed in developing countries?	4
	11. Lack of data on carbon emissions how do you address it?	10
	12. Legislative gaps & weak regulatory framework including enforcement? How do you address / fill these gaps?	12
	13. How do you address capacity gaps in Tech, Funding & Skills?	9



Workshop Evaluation Form

Male:	
Female:	
Workshop location	
Date:	
Name of workshop:	

This form is intended for internal use within the HVT programme. The data provided in this form will be treated with strict confidentiality and will be analysed purely towards improving the programme's provision of validation workshops activities.

1. Reaction

How would you rate the overall content of the workshop in the following areas?

1.1. Usefulness:	Poor	1	2	3	4	5	Excellent
1.2. Relevance:	Poor	1	2	3	4	5	Excellent
1.3. Methods:	Poor	1	2	3	4	5	Excellent

2. Learning

Thinking about the overall topic of the workshop how much have you learned about understanding the research gaps in low carbon transport in your country?

Much less than expected	Less than expected	As expected	More than expected	Much more than expected
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Do the outputs from the workshop address low carbon transport needs and priorities in your country?
If yes briefly explain

3. Behaviour

How likely are you to submit a research proposal for any of the suggested topics

Never	1	2	3	4	5	Guaranteed
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If yes, please provide any information on particular area of interest (optional)

How likely are you to continue your relationship with the HVT programme in your research proposal/work (optional)

Never	1	2	3	4	5	Guaranteed
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4. Reflection

What can we improve to make this process better in the future research scoping? (optional)

Thank you for taking the time to provide this valuable feedback!



IMC Worldwide

64-68 London Road
Redhill

Surrey
RH1 1LG
United Kingdom

www.imcworldwide.com