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Measuring the Rural Transport Premium in Murang'a County, Kenya

Final Report

Tacitus Ltd
GEN2185B
June 2020

The Developmental Participatory Consultants

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Cover photo: Gitugi -Shopping Centre – Picture by Robert Oyoo

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Abstract

The Research for Community Access Partnership (ReCAP) sub-contracted Tacitus Ltd to undertake data collection on Measurement of Rural Transport Premium in Kenya on the Gitugi-Kiamara road junction in Murang'a, county. The indicator is defined as the Rural Transport Premium (ratio of fares per passenger-kilometres on LVRR relative to fares on long-distance bus services).

The study objective was the measurement of the Rural Transport Premium for the year 2020 in comparison with the same ratio calculated in 2014. The intention was to ascertain whether the rural passenger fares on the Low Volume Rural Road has reduced in response to road improvements. Furthermore, the study was intended to capture the socio-economic impact of the road on developments in the past six years.

The fieldwork, unfortunately, coincided with the onset of the COVID-19 virus pandemic. This situation necessitated a review of the study approach, in response to the health regulations meant to curb the spread of the virus. It was also a time that Kenya encountered severe flooding and landslides during the long rainy season resulting in loss of lives.

This final report provides an overview of data collection activities in the field, analysis of the data, and final results. The key result of the research project is that the Rural Transport Premium has reduced from 5 in 2014 to 2.3 in 2020 (based on minibuses). The transport premium ratio during the pandemic rose to 3.5, due to reduced demand and supply for minibus services as a result of the COVID related lockdown and social distancing measures.

Furthermore, the qualitative data provided further information on the impact of the road on agri-business and challenges of intra-village access tracks. Three Most Significant Stories have described the historical background of the road, the role of a boda-boda association on the road, and the impact of COVID on transport services in Kenya and East Africa, including government efforts to achieve safer transport operations during the pandemic.

Key words

Rural, Transport, Premium, Rural fares, Kilometre, Murang'a, Kenya

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Research for Community Access Partnership (ReCAP)

Safe and sustainable transport for rural communities

ReCAP is a research programme, funded by UK Aid, with the aim of promoting safe and sustainable transport for rural communities in Africa and Asia. ReCAP comprises the Africa Community Access Partnership (AfCAP) and the Asia Community Access Partnership (AsCAP). These partnerships support knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources. The ReCAP programme is managed by Cardno Emerging Markets (UK) Ltd.

www.research4cap.org

Acronyms, Units, and Currencies

AfCAP	Africa Community Access Partnership
AfDB	African Development Bank
AsCAP	Asia Community Access Partnership
COVID-19	Corona Virus Disease 2019
CSO	Civil Society Organisation
DFID	Department for International Development
E.g.	Exempli Gratia (for example)
E.t.c	Et Cetera (other similar things)
GBP	Great Britain Pound Sterling
IFRTD	International Forum for Rural Transport and Development
IMPARTS	Interactions Maintenance Provision of Access for Rural Transport Services
KeRRA	Kenya Rural Roads Authority
Km	Kilometres
Ksh	Kenya Shilling
Logframe	Logical framework
LVRR	Low Volume Rural Roads
MSCS	Most Significant Change Stories
NGO	Non-Government Organisation
PWD	People with Disabilities
ReCAP	Research for Community Access Partnership
RTI	Rural Transport Infrastructure
RTS	Rural Transport Service
RTSi	Rural Transport Service Indicators
SaCCO	Savings and Credit Cooperative Organisation
SDG	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
ToR	Terms of Reference
UK	United Kingdom
UK AID	United Kingdom Aid (Department for International Development, UK)
USDc	United States Dollar cents

Executive Summary

The Research for Community Access Partnership (ReCAP) sub-contracted Tacitus Ltd to undertake a baseline data collection at the Gitugi to Kiamara road junction in Murang'a County, Kenya. This is a follow-up to the first International Forum for Rural Transport and Development (IFRTD) research in 2013, funded by ReCAP aimed at identifying, developing, testing and sharing rural transport services indicators with stakeholders such as rural communities, transport operators, regulators, planners, roads authorities and development agencies (Njenga et al, 2013).

In 2014, ReCAP conducted a baseline study in Kenya, when the Rural Transport Premium figure (for minibuses) was recorded as 5 in the programme logframe. In 2020, a second study was commissioned by ReCAP to measure the Rural Transport Premium and to determine any changes in the passenger fare ratio between localised rural transport services, and long-distance transport services. The Rural Transport Premium is defined as fares per passenger-kilometre on low volume rural roads (LVRR), relative to long-distance bus services. The key objective of the collection of both quantitative and qualitative data was to determine whether the ratio of rural transport passenger fares relative to long-distance bus fares has reduced over the past 6 years. The outcome would also indicate any socio-economic impacts of infrastructure improvements to LVRRs in the project area.

The fieldwork coincided with the onset of the COVID-19 pandemic. Due to stringent COVID regulations imposed to curb the spread of the virus, the situation called for a complete re-evaluation and development of innovative ways and a revised approach to data collection in Murang'a. It was also an unusually heavy rainy season marked by landslides and loss of human lives.

This Final Report provides the context, background, and objectives of the study, with a description of revised strategies, field data collection approach, and results. The key result of the research project is that the Rural Transport Premium has reduced from 5 in 2014 to 2.3 in 2020 (based on minibuses). The transport premium ratio during the pandemic rose to 3.5, due to reduced demand and supply for minibus services as a result of the COVID related lockdown and social distancing measures.

The qualitative data highlights the fact the road is not just a feeder road leading to the terminal centre, but also a shorter bypass to the neighbouring county of Nyeri's towns of Kiereni and Kangema. It further leads to Njumbi town on the doorstep of Aberdares National Park. It is currently being upgraded to bitumen standards and a bridge at the junction is being replaced with a new one. Respondents noted that the agri-business productivity flourishing in the county is dependent on well-designed and maintained rural roads. Trucks regularly ply on the route transporting merchandise to various centres beyond the Gitugi shopping centre, while others collect milk and cash crops like coffee and tea to various drying and processing plants.

The report also captures the Most Significant Change Stories providing history and in-depth impacts of the road and challenges that require future attention. These are;

a) The technical, historical, and socio-economic background of Kiamara-Gitugi road improvement from 2012 to 2020. It was initially an earth/gravel road that encountered challenges leading to alternative surfacing processes. Currently, it is being upgraded to bitumen standards.

b) The next story is from a local motorcycle (boda boda) association who shared ways in which they have implemented preventive measures for containing the pandemic among motorcycle taxis.

c) The third and final most significant narratives are extracts of study findings and newspaper reports on COVID-19 impact on transport services in Kenya and East Africa.
   - The measures and impacts of mitigation measures on transport fares.
   - The Impact of COVID on motorcycle operators in East Africa by Transaid.

1 Background

The United Nations member states conference on Sustainable Development Goals (SDG) in 2015 identified marginalisation as a major challenge to poverty eradication across all economic sectors. The forum also acknowledged that an inclusive road network is a key enabler of SDG goals. An appeal was made for all nations to ensure the provision of safe, affordable, reliable, sustainable transport systems for all nationals. The agenda was dubbed as *"leave no one behind".* Kenya is already developing policies and strategies to achieve this goal and the roads sub-sector has declared the provision of all-season roads to everyone within a 2 km radius. The planning and implementation are achieved through successive five-year Vision 2030 Medium - Term Plans (MTP).

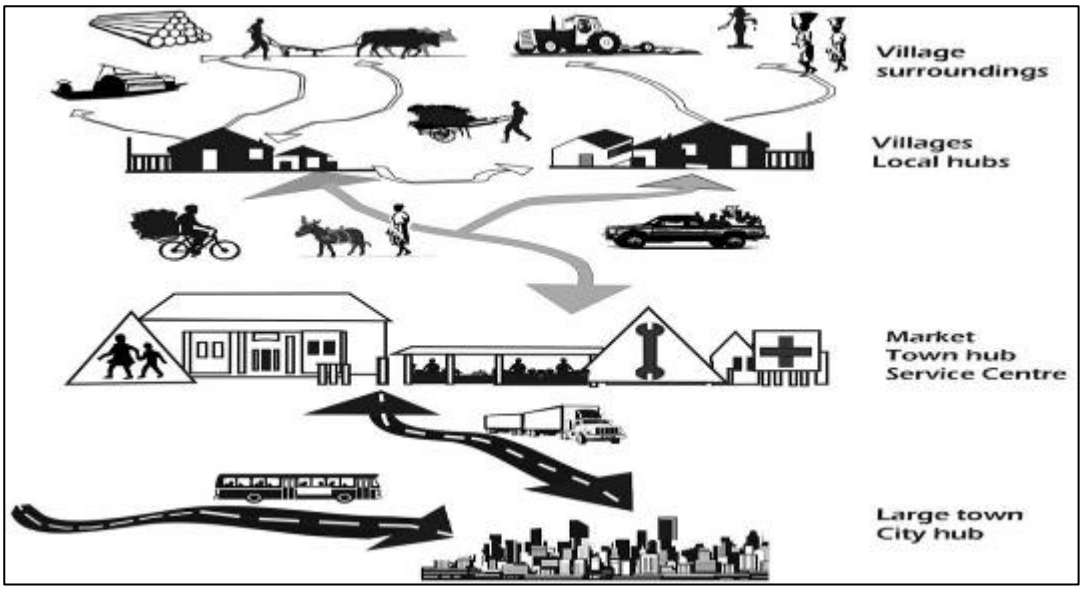
The Research for Community Access Partnership's development of Rural Transport Service Indicators in Africa and Asia is an effort aimed at the inclusivity of provision of reliable accessibility to rural communities. Several studies conducted by ReCAP highlighted;

- Adverse socio-economic impacts on farmers from the inaccessible rural road network.
- Minimal attention accorded to data collection and use in rural road interventions. The Overseas Development Institute's (ODI) baseline study conducted in Kenya in 2016 on SDG inclusive development strategy, emphasised that there ought to be:

"A clear guidance for county governments and national roads agencies on the collection and sharing of roads data, particularly at the county level"

The Measurement of Rural Transport Premium in Murang'a 2020 study is intended to collect the Rural Transport Premium data for Kenya, and demonstrate the impact of improvements to a Low Volume Rural Road on the community. Figure 1 illustrates the dynamics of transport services originating from cities like Nairobi to county headquarters and regional towns such as Murang'a and local market hubs, into villages. It is a two - way transport system from urban to rural destinations and vice-versa. Transport is a key enabler of economic activities with impacts on the livelihoods of both rural and urban communities.

Figure 1: Rural Transport Hubs & Spokes



Source P. Starkey, Simon Ellis, John Hine, Anna Ternell (2002)

2 Introduction

The Getugi – Kiamara LVVR study is a continuation of a baseline study conducted six years ago. The road is managed by the Kenya Rural Roads Authority and the current road classification system is presented in Table 1.

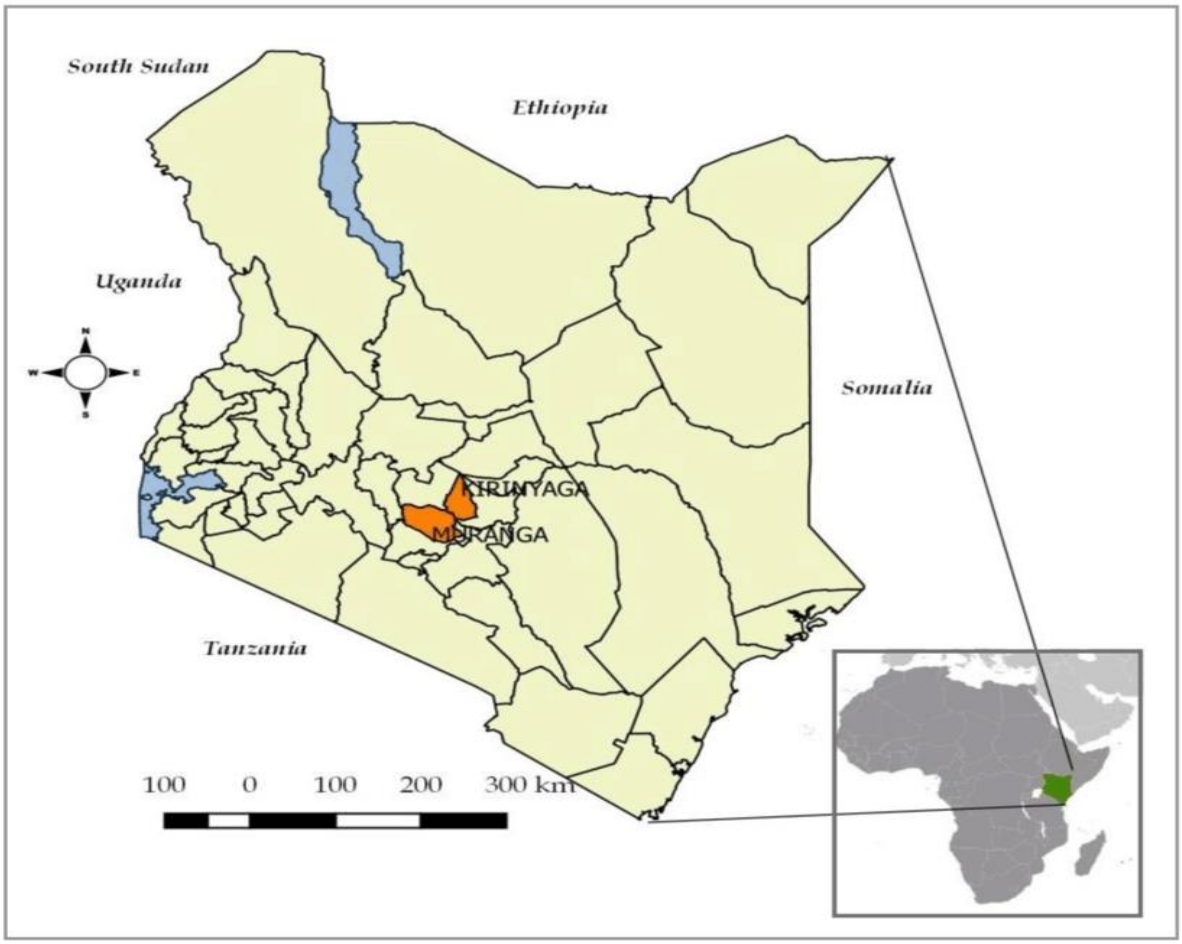
Table 1: Kenyan road classification system

PART A – NATIONAL ROADS	
CLASS	**DESCRIPTION**
CLASS A	International trunk roads linking centres of international importance and crossing international boundaries or terminating at international ports.
CLASS B	National trunk roads linking nationally important centres
CLASS C	Primary roads linking provincially important centres to each other or two higher class roads.
PART B – RURAL ROADS	
CLASS D	Secondary roads linking locally important centres to each other to more important centres or higher class roads.
CLASS E	Any link to a minor centre.
CLASS F	Forest roads.
CLASS G	Roads serving Government institutions
CLASS K	Roads accessing coffee (kahawa) growing areas
CLASS L	Roads accessing settlement scheme areas.
CLASS P	National park roads.
CLASS R	Roads accessing rural areas
CLASS S	Roads accessing sugar-growing areas
CLASS T	Roads accessing tea growing areas.
CLASS U	Unclassified rural roads including mining roads, etc.
CLASS W	Roads accessing wheat-growing areas.
PART C – URBAN ROADS	
CLASS UA	Urban Arterials.
CLASS UC	Urban Collectors including primary distributors, district distributors
CLASS UL	Urban local roads including minor distributors, local streets, residential stand accesses, commercial and industrial stand accesses, shopping streets

ReCAP undertook a study in four countries, using the Rural Transport Premium indicator (calculated in fares per passenger-kilometre on LVRRs relative to long-distance bus service fares). The project site in Kenya was the Gitugi-Kiamara road junction in Murang'a and the baseline ratio result was 5, based on the Rural Transport Premium ratio for *minibuses*, which were the prevailing mode of transport in 2013 (Starkey et al, 2013).

This year ReCAP has supported a second study on the same road, to determine the socio-economic changes, in the intervening years since the last study. The location of research is Murang'a County, which is one of 47 counties in Kenya. It is located 81.5 km north-east of Nairobi. The data collection area is within Mathioya Constituency, which has three wards comprising Kiru, Kamacharia, and Gitugi. River Mathioya crosses through the constituency. According to Kenya, Population, and Housing (2019), Mathioya's population was 92,814 and is the second-largest constituency with 136.9 sq. miles (220.8 sq. km). The topography is steep and hilly. It grows tea, coffee, macadamia nuts, as well as pears, plums, and apples in some parts.

Figure 2: Map of Kenya and Murang'a County Location



Source: ResearchGate article reference https://doi.org/10.1515/opag-2018-0062

3 Research Objective

The research project aimed to collect data on the fares of public transport on low volume rural roads for comparison with fares of public transport along major arterial roads. This was achieved by calculating the Rural Transport Premium (*Fares per passenger -kilometre on LVRR relative to fares of long-distance buses plying the national roads*). Furthermore, socio-economic data were collected to understand how investments in Low Volume Rural Roads impact rural transport services and the mobility of people and goods.

The following are the specific objectives of the assignment:

1) To collect the public transport fares along the project road from various modes of road transport available (motorcycle, mini and midi-buses) on a low volume rural road study project.
2) To calculate the transport fares ratio for the year 2020 and compare it with figures indicated in the ReCAP logframe of 2014. Minibuses had the largest market share in 2014 and the focus will be on this mode of transport
3) To provide a table with Rural Transport Premium for all modes of commercial transport (minibuses, motorcycles, and midi-buses at the data collection site.
4) To indicate the most common, popular mode of transport plying on Gitugi-Kiamara road route
5) To indicate the socio-economic changes as a result of Rural Transport Infrastructure Improvements or otherwise, such as an increase in business, agriculture, and development facilities.
6) To capture changes to the road during the past six years, such as routine maintenance, upgrading or rehabilitation, and impact on the provision of transport services.

4 Survey Area

The Muranga-Gitugi-Njumbi road existed as early as 1989 as an earth/gravel rural road. The Kiamara junction is best known locally as Murang'a to Kangema bridge junction to Getugi. Besides being an LVRR to Gitugi Shopping Centre, we were informed that it is a shorter bypass road to Kangema and Jumbi. It has a carriageway measuring 6.5 metres and a road shoulder of 1.5 metres on both sides. The LVRR has therefore a wider impact area beyond the Getugi shopping centre. A map showing the study area is in Figure 3.

Figure 3: Details of the Study Road

Table 1. Road information

Road name: Gitugi-Kiamara Junction Road- D427/E538/E539	
Dates of Survey: 14th December 2012-18th January 2013 *(intermittent)*	
District, Region and Country: Murang'a County, Kenya	
Road type: Gravel. Class D	*Responsible authority* Kenya Rural Roads Authority (KeRRA)
Road start location: Kiamara Junction	*GPS coordinates at start:* Longitude : 37.122910; Latitude :-0.709532
Road finish location: Gitugi	*GPS coordinates at finish:* Longitude : 37.020037; Latitude : -0.651706
Road length: 15.3 km	*Catchment population*

Road quality and condition from different perspectives

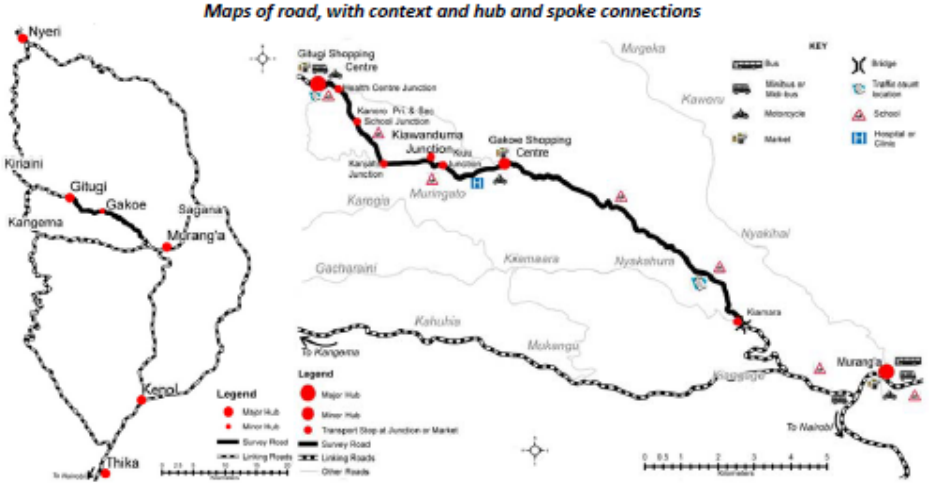
Road authority	*Operators*	*Development*	*Safety*
	★★★☆☆	★★★☆☆	★★★☆☆

Summary of road geography and socio-economic situation

The surveyed road runs 15.3 km from Kiamara junction (also known as Gitugi-Kangema junction) to Gitugi Shopping Centre. Kiamara junction is 6.7 km from Murang'a, a county town and a major transport hub. Gitugi is the main commercial hub of Gitugi division. There are many small shops, a post office and a large open-air market that trades daily but with Wednesdays and Saturdays as the main market days.

The area is hilly with numerous parallel ridges and valleys. The road follows the shoulders and ridges of hills as it traverses several wards and the small hubs of Gakoe, Kiwanduma and Kiuu. There are five schools and two health facilities along road. The hilly terrain with its light, erodible soils has only medium smallholder agricultural potential and crops grown include maize, legumes, vegetables, mangoes, bananas and avocados. Coffee production has been declining. Households are located on either side of the ridge and are linked to the road through small access tracks, most of which are only accessible by foot or motorcycles. The access tracks often channel run-off water which causes erosion and gullies in the rainy season.

Maps of road, with context and hub and spoke connections



Source: P. Starkey. Rural Transport Indicators Report Gitugi -Kiamara Road Junction 2013

5 Methodology and Approach

Both secondary and primary data was collected in the study. To deliver on the objectives of data collection, a mix of quantitative and qualitative data methods were applied for data collection and verification. Further information on the precise methods adopted, including data tables and checklists can be found in the Inception Report.

5.1 Secondary Data

The data collection process was preceded by a literature review. It facilitated better comprehension of the origin of the study, objectives, guidance, and value of the second baseline study. Furthermore, the review furnished us with evidence where necessary through sources such as the Kenya National Bureau of Statistics website. The reference materials are discussed in the Inception Report.

5.2 Primary Data

The primary data collection activities comprised the following methods, which are described in the next sections. Data collection methods are provided in full in the Inception Report.

Data Collection Methods and Representation Breakdown		
Method	**Representation**	**Target Groups**
Key Informant Interviews	6	KeRRA – Nairobi & Muranga, Ministry of Lands – Murang'a Chief Gitugi ward, Health Clinics, LVRR Road Contractor
Focus Group Discussions	3	Transport minibus/midi bus, boda-boda associations and women vendors at Gitugi Market
Most significant change stories	2	KeRRA Headquarter and Gitugi boda-boda Association
Survey questions on transport service fares	15	These included vendors Gitugi market, community members from all trades and Long-distance bus services

5.2.1 Quantitative Data Method

In this study, the Terms of Reference provided a formatted questionnaire data collection tool. The details guided the research on key data required such as transport origin, destinations, distance, fare, and freight details. These closed-ended questions were much easier to apply, took a shorter duration time compared to qualitative methods. The value of this tool is that responses are based on figures, which can be verified through other sources. Fifteen respondents were interviewed to obtain the transport service fare data.

5.2.2 Qualitative data

Qualitative data collection methods were applied to explain, verify, or reinforce the quantitative data results. These included questionnaires with open-ended questions administered through face-to-face interviews. It was sometimes challenging to extract information from respondents due to prevailing restrictions limiting contact. The data we focussed on covered three areas namely transport services, public amenities, and socio-economic status. Focus Group Discussions were conducted through Team Leaders with a checklist to obtain members' input. This was in response to health restrictions imposed the restricted public gatherings.

Due to the pandemic restrictions on public gatherings the FGD could only be conducted indirectly. This was achieved through Chairpersons, who were briefed to meet with members at particular times, in order to maintain social distancing. Information on transport fares was obtained through both survey questionnaires and FGDs to verify and triangulate the data and other socio-economic issues. The FGDs comprised the following groups:

1. The Gitugi boda-boda Association has 17 members represented by a Chairperson
2. The Mathioya Transport Association has 15 drivers represented by a Chairperson
3. The women market vendors were 10 in number.

5.2.3 Key Informant Interviews

Key Informant Interviews were conducted with key stakeholder institutions at the national and county levels. This included gathering data from the Administrators, Education, Lands, and Road agencies. In certain circumstances, we resorted to communication through letters to reach these specific target groups.

5.2.4 Observation

Through observation in a real-life situation, it was possible to visualise whether commuters and transporters were adhering to COVID health measures and challenges. This method is useful for evidence purposes and determination of appropriate intervention, in situations where behavioural change is necessary to achieve a goal.

5.2.5 Most Significant Change Stories

The Most Significant Change Stories (MSCS) technique is also a monitoring and evaluation tool. It provides the opportunity for stakeholders to record changes that have occurred over a period. We used it to gather data on the improvement of LVRR on the community and the role of the motorcycle taxis associations in the project area.

5.3 Impact of COVID on Study Process

Due to the COVID pandemic, a comprehensive review of all the research strategies was necessary to re-align the study approach to the emerging situation. The principles guiding Quantitative data collection and verification by Qualitative data remained the same. To control the rapid spread of the disease the following measures were undertaken by the government:

- Outlawed all public gatherings, use of entertainment spots, hotel businesses, and movement outside Nairobi, Mombasa, Kilifi, and Kwale. Curfews were imposed nationally from 7 PM – 5 AM daily. International flights were also suspended.
- The country's borders were also restricted in the East African region leading to a transport backlog across all borders.
- Sensitisation took place through the media and by health practitioners. The wearing of a face mask was mandatory including social distancing.
- Public service vehicles were directed to ferry only half of the vehicle passengers' capacity and adhere to health sanitisation measures. The restrictions were subject to review by July 2020 nationally.

5.4 Reviewed Approach & Strategy

The planned community entry approach designed during the Inception Phase was now impractical. The following steps were taken to conduct the data collection process.

- First, we had to evaluate the data collection options at our disposal. The Kenya National Bureau of Statistics (KNBS) was consulted on the possibilities of using their regional staff. This was however not possible due to the timing of the request, as they were equally occupied. They nevertheless advised on recruiting a few enumerators from the study area and utilising digital modes of communication.

- Enumerators from Murang'a County were assessed and deployed to collect data from target groups in that county. The long-distance standard bus fares were collected from transport offices in Nairobi including other data that could only be sourced from road agencies in the city.

- Due to travel restrictions imposed in Nairobi and Mombasa, most other counties had relatively lower infection rate and freedom of mobility. The enumerators in Murang'a were provided with a thorough health and safety briefing to reduce the risk of transmission, as well as training on the data collection requirements. They were required to read literature and watch a video on COVID prevention measures before any field activities commenced. They were also provided with face masks for themselves and their families, as well as hand sanitiser for use in the field and at home.

- During fieldwork, the data collectors were regularly in touch with the Research Service Provider via phone calls, WhatsApp, Microsoft Teams, and SMS for consultation purposes

5.5 Increase of Transport Fares on Data Collection

Furthermore, the health measures led to an increase in transport fares, necessitating a revision of the quantitative and qualitative data tools. This was achieved by backdating them to reflect the 2-3 months before the COVID pandemic. The aim was to provide a realistic picture of LVRR impact in the past six years up to 2020 before the pandemic. Data was also taken during the pandemic to provide the impact of COVID on transport services. The passenger fares were only marginally increased. Petrol prices also dropped due to low demand.

5.6 Data Collection Target Groups

In our Inception Report, we proposed to conduct traffic counts in indicating the traffic volume. However, with the effects of the COVID pandemic, it was not possible to carry out this process. Furthermore, the traffic volume was minimal, except for essential services. Murang'a County's major market is Nairobi for agricultural produce leading to transport frequency between the city and town.

We acknowledged that despite having engaged data collectors, there were limits to the capacity to collect data in all institutions. Furthermore, the Terms of Reference states that data was also required from Long-distance standard bus fares on national roads, which are exclusively based in Nairobi. The mini and midi buses take over medium distance trips to neighbouring counties like Murang'a Machakos, Kiambu, and Kajiado. Therefore, besides the restriction of travel beyond Nairobi city, this transport pattern led to the decision to divide the data collection process as follows:

- Data related to Murang'a rural transport services both qualitative and quantitative were collected from the county.

- Data related to Gitugi -Kiamara Low Volume Rural Road construction history, challenges, and status were collected from Kenya Rural Roads Authority Headquarters which is the rural road asset management agency.

- Data related to long-distance Bus fares were collected from Company bus offices where fare and freight tariffs are displayed and reflected in websites. A list of participants is in the Annex.

6 Quantitative Data Results

6.1 Most Common Transport Mode on LVRR and Fares

The most common transport mode from Kiamara - bridge junction up to Getugi shopping centre are boda-boda taxis charging Ksh 400 (4 USD) along with the two destinations of 15.3 km. They approximately number is 110 operating according to the SaCCO association report. Though more expensive, they are a major transport mode linking off-road villages and farms to paved roads. These transport services are popular as:

- They operate as taxis for hire and are frequent along the Low Volume Rural Roads, supplementing minibuses, services, especially during the COVID pandemic when the number of passengers is minimal. They have not raised fares during the pandemic.
- They can be reached by mobile phones whenever necessary to ferry load up to 100 kg or passengers to destinations, door-to-door.
- They serve as the only means of transport ferrying the sick to clinics from villages. Equally, they perform messenger functions.
- They also employ the youth in the area generating income for many families. As such, they boost the local economy as some are owned by local community members
- Through boda boda taxi services, other related services have emerged such as the provision of mechanical services, spare parts, and accessories.

The second common mode of available transport service are minibuses who charge Ksh 100 (1 USD). Reports indicate that midibuses that are becoming rare in this route and ply along the route on market days or if going beyond Gitugi – Kiraine, Kangemi, or Njumbi town which near the Aberdares National Park. The passenger fares for the mini and midibuses from Murang'a through Kiamara rural road junction were Ksh 100 before the COVID and during the pandemic, it rose to Ksh 150.

6.2 Long-Distance Bus Services on National Road Fares

For long-distance buses, the passenger fares on national roads were collected from three standard non-luxury buses from Nairobi to Kisii, Nairobi to Kisumu and Nairobi to Mombasa. We also noted that the passenger fare to Mombasa in ordinary long-distance buses is quite fair, despite the long-distance coverage. The route enjoys a variety of transport modes. The recently completed standard gauge rail services charge USD 10 for a journey lasting 5 hours. The fare for long-distance buses is verifiable from respective transport company tariffs as recorded in the table below.

Table 2: Long-distance bus fare rates

COAST BUS SERVICE NAIROBI -MOMBASA			
Classification of buses	**Travel Time**	**Fare**	**USD**
Coast Air	Day and Night	Ksh 1,600	16
Executive	Night only	Ksh 1,400	14
Ordinary	Day and Night	Ksh 1,200	12
Mwananchi	Night only	Ksh 1,000	10
We applied the ordinary class fare as indicated in the Terms of Reference			
GUARDIAN BUS SERVICES and TRANSLINE BUS SERVICES NAIROBI - KISUMU			

Class	Travel time	Fare	USD
FARE	Day and night	Ksh ranging from 1,200 to 1,500 depending on a class of transport booked	12 to 15
Nairobi - Kisii	Day and night	Ksh 800	8
Nairobi - Kisumu	Day and night	Ksh 1,200	12

6.3 Transport Services Fare Challenges

There has been a tendency for arbitrary increases in transport fare, depending on challenges like climatic changes resulting in floods impacting on roads, festive seasons, or a case like COVID pandemic. These situations are beyond the passengers' control. The Ministry of Transport and Infrastructure has noted this dilemma and presented a paper to the Parliamentary Transport Committee in March 2019, intending to amend the Traffic Act section 119 (1) and the National Transport and Safety Authority Act section 4 (2) aimed at capping fare charges wherever appropriate. A recommendation has also been made for the introduction of standard PSV fare tariffs and mechanisms to address the situation beyond both parties. Consultation on the subject is still at preliminary stages.

6.4 Quantitative Data Analysis

Table 3: ReCAP logframe – impact indicator 2

Impact Indicator 2		Baseline (July 2014)	Milestone 1 (July 2015)	Milestone 2 (July 2016)	Milestone 3 (July 2017)	Target (July 2020)	
Rural transport premium (fares per passenger-kilometre on LVRR relative to fares on long-distance bus services).						Before COVID	During COVID
	Kenya	5				2.3	3.5
	Tanzania						
	Nepal						
	Myanmar						

The key result of the research project is that the Rural Transport Premium has reduced from 5 in 2014 to 2.3 in 2020 (based on minibuses). The transport premium ratio during the pandemic rose to 3.5, due to reduced demand and supply for minibus services as a result of the COVID related lockdown and social distancing measures. The ReCAP logframe of 2014 Impact Indicator described the Rural Transport Premium as (*fares per passenger -kilometre on Low Volume Rural Roads relative to similar fares for long-distance bus services).* The ToR provided the Low Volume Rural Road route length as 15.3 km and required that data collectors get and verify the fares for both minibuses and long-distance standard buses on national roads. The process for Rural Transport Premium calculation was formulated as follows:

$$Rural\ Transport\ Premium = \frac{Fares\ per\ passenger\ kilometre\ on\ LVRR(USDc)}{Fares\ per\ passenger\ Kilometre\ on\ long\ distance\ buses\ on\ national\ roads\ (USDc)}$$

A step by step calculation of the Rural Transport Premium is described below:

1) The fare between Kiamara bridge road junction up to GItugi was found to be Ksh 100. To obtain the fare per passenger kilometre on LVRR implied dividing (Ksh100 ÷ 15.3Km) = **6.54 Ksh per passenger Kilometre Fare.**

2) The January 31st, 2020 exchange rate was applied in calculation of Rural Transport Premium before COVID which was (Ksh 1 = 0.0101 USD). Therefore, to convert Ksh 6.54 into USD meant (6.54 X 0.0101= **0.066054 USD**).

3) To convert 0.066054 USD to USDc meant (0.066054 X 100) = **6.6054** or **(6.6 USDc)**

4) The calculation is summarised as (Ksh 100 ÷ 15.3 X 0.0101 X 100) = 6.601 USDc

5) The same process was applied for the long-distance buses on national roads. However, it was necessary to get an average passenger per kilometre fare for all the long-distance buses as per the ToR. This was achieved by adding the passenger per Km unit rates and dividing the result by 3 transport bus services as follows (3.5+2.6+2.5 = 8.6÷3= **2.9 USDc**)

6) The Rural Transport Premium ratio for 2020 was then derived by dividing (6.6 ÷ 2.9) = **2.3**

The Rural Transport Premium ratio after the onset of the COVID pandemic followed the same process with an exchange rate for June 12th, 2020 applied at Ksh 1= 0.0094 USD. The outcome result ratio was **3.5.**

Table 4: Mini and midibuses and long-distance buses on national roads Pre-COVID

FARES PER PASSENGER KILOMETRE FOR MINIBUSES MURANG'A KIAMARA BRIDGE JUNCTION TO GETUGI SHOPPING CENTRE									
Start	Destination	Distance (km)	Passenger Fare Ksh	Cost- per passenger kilometre (Ksh)	Cost- per passenger kilometre USDc	Small Freight Example	Small Freight weight (kg)	Small Freight cost Ksh	Small Freight cost per kg USDc
Murang'a town Kiamara bridge Junction	Getugi	15.3	Ksh 100	6.54	6.6	bag of potatoes, maize or onions		Minibuses have seats built into luggage boot. Luggage are squizzed between seats	
FARES PER PASSENGER KILOMETRE PER FOR MIDIBUSES KIAMARA JUNCTION -GETUGI SHOPPING CENTRE									
Murang'a town Kiamara bridge	Getugi	15.3	Ksh 100	6.54	6.6	bag of potatoes, maize or onions	50	Have capacity for accompanied luggage but no standard rates	
FARES PER PASSENGER KILOMETRE PER PASSENGER FOR LONG DISTANCE BUSES ON NATIONAL ROADS FROM NA IROBI TO KISII, KISUMU, AND MOMBASA									
Start Place	Destination	Distance	Passenger fare Ksh)	Passenger fare per Km (Ksh)	Cost per passenger per Km USDc	Freight Example	Small Freight Weight (kilogram)	Small Freight Cost (USD)	Small Freight Cost per kg per km (USDc)
Nairobi	Kisumu	350 Km	1200	3.42	3.5	Bag of maize	26	No standard charges for passenger accompanied freight except courier services.	
Nairobi	Kisii	315 Km	800	2.53	2.6	Bag of maize	26		
Nairobi	Mombasa	488km	1200	2.45	2.5	Bag of maize	26		
				Total	**8.6**				
(Exchange rate as per January 31, 2020: 1 USD = 0.0101 Ksh					Average; (3.5+2.6+2.5)/3= 2.9 USDc				
					Rural Transport Premium (6.6÷2.9) UDSc= **2.3**				

Table 5: Mini and midibuses and long-distance buses on national roads during COVID lockdown

FARES PER PASSENGER KILOMETRE FOR MINIBUSES MURANG'A KIAMARA BRIDGE JUNCTION TO GETUGI SHOPPING CENTRE									
Start	Destination	Distance (km)	Passenger Fare Ksh	Cost- per passenger per kilometre (Ksh)	Cost- per passenger per kilometre USDc	Small Freight Example	Small Freight weight (kg)	Small Freight cost KSH	Small Freight cost per Kg USDc
Murang'a town Kiamara bridge Junction	Getugi	15.3	Ksh 150	9.8	9.2	Personal luggage	N/A	Minibuses have seats built into luggage boot. Most light luggage is squizzed between seats.	
FARES PER PASSENGER KILOMETRE PER FOR MIDIBUSES KIAMARA JUNCTION -GETUGI SHOPPING CENTRE									
Murang'a town Kiamara bridge	Getugi	15.3	Ksh 150	9.8	9.2	Personal luggage		Have the capacity for accompanied luggage but no standard rates.	
FARES PER PASSENGER KILOMETRE PER PASSENGER FOR LONG DISTANCE BUSES ON NATIONAL ROADS FROM NAIROBI TO KISII, KISUMU, AND MOMBASA									
Start Place	Destination	Distance	Passenger fare (ksh)	**Cost per passenger per km in Ksh**	Cost per passenger per km (USDc)	Freight Example	Small Freight Weight (kg)	Small Freight Cost (USD)	Small Freight Cost per kg per km (USDc)
Nairobi	Kisumu	350 Km	1200	3.42	3.2	Second - hand clothes	26	No standard charges for passenger accompanied freight except courier services	
Nairobi	Kisii	315 Km	800	2.53	2.4	Bag of Rice	26		
Nairobi	Mombasa	488km	1200	2.45	2.3	Second - hand clothes	26		
				Total	**7.9**				
(Exchange rate as per June 12, 2020, Ksh 1= 0.0094 USD					Average of fares of three transport buses services (3.2+2.4+2.3)/3= 2.6 USDc				
					Rural Transport Premium 9.2 ÷ 2.6 USDc **= 3.5**				

Table 6: Pick Up trucks hired by the community for transportation services

Pick-up trucks							
Start	**Destination**	**Distance**	**Freight cost**	**Cost- per freight in USD**	**Cost- per freight per kilometre USD**	**Freight Example**	**Freight weight**
Murang'a	Gitugi	22	3000	28.2	1.28	Timber	2 tonnes
Gitugi	Murang'a	22	3000	28.2	1.28	Farm produce	2 tonnes
Murang'a	Gitugi	22	2000	18.8	0.85	Groceries for shops in the centre	1 tonne
Murang'a	Gitugi	22	3000	28.2	1.28	Fertilizers	2 tonnes
Murang'a	Gitugi	22	2000	18.8	0.85	Cow feeds	1 tonne
Murang'a	Gitugi	22	3000	28.2	1.28	Hardware products	2 tonnes

Table 7: Motorcycle taxis

Motorcycle Taxis									
Start place	Destination	Distance in kilometres (km)	Passenger fare paid (Ksh)	Cost per passenger Km (Ksh)	Cost per passenger Km (USD¢)	Small freight example	Small freight weight (kg)	Small freight cost (Ksh)	Small freight cost per kg per km (USDc)
Gitugi centre	Kiamara	15.3	400	26.14	26.4	Grain and crops from field to bus stops	80 kg	400	5.05
Motorcycles are hired to carry farm produce regularly to destinations. During such time they charge the freight as passenger fare for the journey length. In such cases, they do not carry passengers									

7 Qualitative Data Results

The objective of the qualitative data collection exercise was to provide a greater understanding of the socio-economic activities in the study zone. These services are dependent on the sound management of rural road assets. The methods applied in data collection included interviews based on tailored questionnaires and checklists. The data assisted in:

1. Verification of the quantitative data.

2. Justification of the improvements of the rural road due to socio-economic potential in the area.

3. Another aim was to furnish the study with information on economic activities relative to the road condition and challenges. The interview was categorised into three main areas:

   a) Low Volume Rural road and impact on Transport Services
   b) Low Volume Rural Road and impact on the provision of public amenities
   c) Low Volume Rural Road and impact on community socio-economic activities

7.1 LVRR and Transport Services

Respondents affirmed the fare rate from the Kiamara road bridge junction to the Getugi shopping centre was Ksh 100 but felt that it was rather high. They attributed the current rate to a monopoly of transport services by one minibus transport SaCCO and wished for speedy completion of the road to spur greater competition. The minibuses usually take one to two trips per day and are cheaper than boda-boda motorcycle taxis. Despite this, the boda boda taxi services are appreciated due to the ability to access the villages. We also learnt that the road is also a bypass leading to centres like Kangema, Kiraine in Nyeri county, and Njumbi which is just next to Aberdares National park.

7.1.1 LVRR road Rehabilitation and Village Accessibility Challenge

The main road from the Kiamara bridge junction to the Gitugi shopping centre has benefited farming activities due to improvements in the road infrastructure made over the past six years. First, it was widened and upgraded from earth to gravel surface, although the gravel was washed away during the rainy season. Currently, the upgrading of the road to bitumen standards is underway. The bridge is also under construction. The community noted that the upgrading of the road has taken quite long since it commenced in 2012 up to now 2020. Further verification revealed that the improvement of the road was suspended due to governance reforms in 2013, which created 47 counties in response to the 2010 constitution of Kenya. The transition also included budgetary re-allocation, which affected several projects across the country. The road rehabilitation of the road has passed the planned completion time and the county and national government making all efforts to finalise the project before the end of 2020.

The community however lamented the poor condition of intra-village and farm footpaths. Most villages are inaccessible during the rainy season. All these make transportation of crops or patients a challenge, as motorcycle taxis cannot access the slippery routes. They expressed concern that attention is required by road establishments to address this perennial problem.

Figure 4: Gitugi-Kiamara Road Upgrading

Source: Picture by Edwin Macharia

Figure 5: Village tracks a challenge in intra-village - farm access

Source: Picture by Edwin Macharia

7.1.2 Transport Related Services

Getugi has two operating petrol pumps and a mechanics serving the motorcycle taxis in the area. The boda boda operators even feel that with a large number of motorcycles, there is a growing need for motorcycle distributors to train local youth in mechanical maintenance skills. Furthermore, some people from the community own motorcycles taxis. Still, several people walk to market centres, using boda-boda transport and hired pickups or minibuses. However, since Getugi is near Murang'a town most transport service business is located in that town.

7.2 Transport and Public Amenities

7.2.1 Access to Education

During the data collection exercise, it was mentioned that despite the presence of several schools in the area, the enrolment of pupils is low. The higher number of schools in the area is an indication that accessibility may not be a major cause of low enrolment. A further study would establish more on the causes of this status. However, the eight sampled schools indicated a slightly higher number of enrolment of boys than girls as shown in the table below. Certainly, some have quite a low overall enrolment.

Table 8: Pupil enrolment in schools

School	Boys	Girls	Total
Gitugi primary	340	312	652
Gakambura primary	174	199	372
Kanoro primary	76	89	165
Brightstar academy	107	72	179
Githendu primary	167	138	306
Chui primary	159	137	296
Gitugi secondary	181	206	387
Matutu secondary	80	53	133
	1284	1206	2490
Enrolment by gender	51.56%	48.44%	100%

7.2.2 Access to Health Facilities

Two dispensaries combined namely Gitugi and Gakoe approximately receive 70-80 patients daily. This is due to the higher population covered. Most visits are made by women of all ages. A doctor at a clinic narrated how the road improvement had eased travel on the road especially from a medical viewpoint. It is now easier to:

- Transfer patients from medical facilities to Murang'a hospital in cases of emergency
- The medical staff are not late for work due to shorter travel times, even from Murang'a town
- Hospital motorcycle couriers deliver urgently required drugs to clinics with ease.
- Patients also access the hospitals much faster apart from intra-village accessibility.

7.2.3 Access to Markets

Markets are dominated by women commodity sellers aged between 35 years up to 55 years. Most of the commodities sold include; tomatoes, onions, bananas, mangoes, maize flour, rice, milk. The agricultural produce is low and attracts middlemen with trucks come from Nairobi to collect to buy the produce for sale into markets centres in the city which has a higher demand. Agricultural tools are also sold during market days.

7.3 Social and Administrative Facilities

The area also has a County Ward Representative elected by members of the community, who attends community development concerns on Tuesdays and Thursdays. The Chief office is important in maintaining law and order. Social activities take place during political functions or festive seasons in large school premises or homes. Youth from the area use the school facilities such as fields and halls for sporting practices.

7.4 Transport Contribution to Socio-Economic Activities

7.4.1 Agriculture as a major Income Source

Farming is the main source of income as the community grows coffee and tea as the main cash crops. Others are dairy farming and fruit farming such as mangoes, bananas, and avocadoes. These are supplemented by trade in various domestic commodities. Murang'a County is one of the highest milk s and avocado producers in Kenya. It has three milk processing plants. Farmers around the study zone are some of the key small-scale producers.

Transportation of farm produce is therefore important in an agricultural environment. For instance, coffee, tea, and milk are collected from farmers to the processing factories. This has promoted cash crop and fruit farming as key income sources. Agri-based products such as animal feed can reach the community with ease, the same to farm inputs used in preparing land for cultivation. Field extension officers move around supporting farmers in the productivity of crops and dairy farming.

Figure 6: A dairy pen in a farmer's home in Gitugi

Source: Picture by Edwin Macharia

Figure 7: Coffee-beans on a dryer

Source: Picture by Edwin Macharia

7.4.2 Commercial Activities

This includes activities such as mechanical repair, electronics, and hardware, maize meal building constructions in the area. These activities have created employment to the artisans around and the wider transport sector ferrying materials from Murang'a or Nairobi. Furthermore, various types of businesses are concentrated at the Gitugi shopping centre. This includes butchers, shops, cyber cafes, agro vets, bars and restaurants, hotels, hardware stores, petrol pump services, spare parts, and electronics shops. Furthermore, the centre has the provision of money transfer services like Mpesa and Equity Banking agents minimising physical transfer to banks in Murang'a town. There is also a coffee farmer Sacco known as the Murata Sacco where farmers access their pay and get loans. Equally wholesale distributors ply the route delivering merchandise to market centres such as Gitugi, Kangema. Kiereni and Njumbi. Table 9 displays the products distributed.

Table 9: Product distribution in market centres

	Wholesale Truck Distributors		
Truck distributors	**Products distributed**	**Cost in ksh**	**Cost in USD**
Distributors do not charge transportation costs, as they are wholesalers bringing products into the rural areas	Rice 50 kg	3800	35.85
	Dozen maize flour	1270	11.92
	Cooking oil 20 litres	2700	25.35
	Dozen Wheat flour	1230	11.55
	Sugar 50 kg	4400	41.31
	Beer per crate	3600	33.80
	Soft drinks per crate	570	5.35
	Washing detergents 25 pieces	2650	24.88
	Salt one bale	580	5.45
	Cattle feed 70 kg	2000	18.78

7.4.3 Land Value Appreciation

Land value has appreciated especially those by the roadside. The area is very Murang'a town hence the town is likely to expand to within a radius of 15 – 20 km. The Aberdares National Park is also nearby and is a major tourist destination. The table below provides the cost of land, which has doubled over the years.

Table 10: Land costs in Murang'a

Gakoe area	**(exchange rate, Ksh1=0.0094USD) source Ministry of Lands -Murang'a**			
size	**2014 cost in ksh**	**2020 cost in ksh**	**2014 cost in USD**	**2020 cost in USD**
0.05HA	400000	800000	3760	7520
Getugi area				
size	**2014 cost in ksh**	**2020 cost in ksh**	**2014 cost in USD**	**2020 cost in USD**
1 acre	800000	2000000	7520	18,800
0.5 acre	400000	1000000	3760	9,400

Figure 8: Coffee seedlings in coffee cooperative drying facility for sale to farmers - Gitugi

Source: Photo by Edwin Macharia

8 Most Significant Change Stories

8.1 Background Murang'a - Gitugi -Njumbi -Mioro Road

The Murunga-Gitugi-Njumbi road circuit existed as early as 1989 as an earth/gravel seasonal road. As an agricultural area, it adversely affected the transportation of farm products to markets. The inhabitants lamented the condition of the rural roads, which was addressed by elected representatives, through the advocacy of the need for upgrading the road to bitumen standards. A tender was awarded to a contractor who commenced work on the road on 31st July 2012. The project included Kiamara – Gitugi road bypass programmed to be completed in February 2015. It covered a total of 40 km and is funded by the Government of Kenya.

A conventional approach was applied in the improvement of the road with a carriageway measuring 6.5 metres and a road shoulder of 1.5 metres both sides. These standards appeared higher for rural road design, but today we appreciate the technical dimensions, as an improved rural road attracts increased traffic volume in high agricultural productivity areas. It is now capable of taking trucks to agricultural factories and distribution of merchandise to shopping centres with ease. Furthermore, the mobility of rural areas is characterised by minibuses and midibuses, intermediate means of transport (motorised and non-motorised), and pedestrians.

Figure 9: Section of the Road to Bituminous Standards

Source: Picture by Edwin Macharia

8.1.1 Challenges during Road Upgrading

The contractor, however, faced some technical challenges, which required to be addressed before proceeding with the project. These were:

a) Inadequate gravel within cost-effective haulage distance. This led to redesigning the road surface to use hand-packed stones that were applied.
b) Furthermore, the constitution of Kenya 2010 led to the reform and creating of 47 county governments. However, the transition process was marked by both legal, financial, and administrative reforms, which affected the roads sub-sector. For instance, resources had to be divided between two levels of government. This led to financing and implementation delays resulting in a temporary suspension of the roadworks.
c) However, through inter-governmental collaboration between the national and county government, KeRRA was mandated to oversee and complete this circuit of the road network as initiated earlier.
d) Furthermore, a road safety audit revealed that the old bridge across the river Mathioya from the Kiamara bridge junction to the Getugi shopping centre was too narrow to support the vehicular load plying on the route. Furthermore, the location of the bridge was on a bend where the visibility of a turning vehicle was obscured.

Figure 10: A new bridge under construction (Kiamara junction bridge to Gitugi)

Source: Picture by Edwin Macharia

Figure 11: Old bridge Kiamara-Gitugi Road Junction

Source: Picture by Edwin Macharia

8.1.2 Socio-Economic Benefits of Improvement of the Road

Stakeholder consultations

KeRRA promotes consultations with the stakeholders and local representatives in all phases of roadworks. This is achieved through Constituency Roads Committees where political representatives can also present their development agenda. As such all stakeholders agreed on the urgent need for rehabilitation of the entire road-circuit network. This led to the inclusion of Murang'a Kangema-bridge Junction to Getugi bypass in the same contract, which has improved accessibility to farming and other destinations.

Employment Creation Opportunities

Some of the roadworks involved using a labour-based approach like hand-packed stone surfacing. Recent figures from the contractor indicate that in February 2020, 208 people were employed comprising 189 men against 19 women. The total number of people employed since the inception of the road is certainly much higher, but the figures were not readily available at the time of the study period.

Lower Vehicle Operating Costs

The upgrading of the Low Volume Rural Road network to all-weather bitumen standards has led to a reduction in vehicle operating costs. The result is immense savings by transport operators and competition reducing transport fares. We could not however identify a Public Service Vehicle minibus owner, who continuously operated transport services from 2014 to give us data on vehicle maintenance costs for comparison with the 2020 status.

Reduction in Travel Times

Improved road infrastructure has also reduced vehicle travel time. The travel time between Kangema, Murang'a, and Kiraini is now shorter through the bypass. Murang'a to Getugi used to take 1.5 hours and now it takes only 25 minutes.

Enhancement of Agri-Business and Trade

The result is increased transactions in trade, and also reduced loss of perishable commodities such as milk and horticulture products. Reports indicate the boosting of agricultural productivity like bananas, avocados, and passion fruit. Small-scale businesses have sprung along the roadside serving motorists and pedestrians. Hotel and affordable accommodation lodges, shops, and entertainment facilities have now thrived within the area. Furthermore, Murang'a County is one of the highest milk producers in central Kenya. It has 3 major milk processing plants, namely Kenya Cooperative Creameries, Aspendos Dairy Plant, Murang'a Milk Production and Packaging Plant. An Avocado Cooperative Plant has also been established. Getugi ward where the road traverses is one region where farmers' livelihoods are dependent on the delivery of milk and horticultural produce to factories and markets in Nairobi.

Improved Environment

The upgrading of any rural road to bitumen standards minimises pollution from dust that affects the health of villagers. Dust also affects crops and all these environmental hazards have been eliminated.

8.1.3 Accessibility to Public Amenities

Improved mobility leads to accessibility to markets, hospitals, schools, factories, administrative centres and other facilities serving the community. The improved accessibility has also seen an increase in Boda Boda taxi services vital for intra-farm/village commuters. A few of the public amenities are listed in Table 11.

Table 11: List of public amenities

Schools	Tea factory	Health
Ruiru Primary School	Mioro Tea factory	Nyakirengo Hospital
Nyakerengo and Kanoro Primary	Kiawanduma Coffee Factory	Gitugi dispensary
Gitugi and Kainyatu Primary	Kahiriga Coffee Factory	Gakoe dispensary

8.1.4 Future Challenges and Recommendations

The main foreseen challenge is inadequate maintenance funds from the Road Maintenance Levy Fund. The allocation is now 24.8% as opposed to 32% as the county government has also to be allocated funds from the same source for roads under their mandate. This is an area that will require further attention as road maintenance is key to a sustainable transport system.

Furthermore, maintenance of the drainage is a challenge due to the steepness of the valley and resulting landslides, so there is a need to allocate funding for improved drainage to ensure a clear and well-maintained road pavement. It is also foreseen that once the road is completed it will likely attract a higher number of vehicles to destinations beyond Getugi. Maintenance is therefore a key factor in the long - term sustainability and durability of the road.

8.2 Gitugi Boda Boda Association

The Gitugi boda boda association was started five years back. There are 110 boda boda operators in the area plying passengers along Murang'a Kangema junction to Gitugi shopping centre. Seventeen operators have joined a Sacco group known as Shanjamoka bodaboda operators. The name is derived from the Swahili word "Changamka" meaning excitement or being actively lively.

The group has a Chairperson, Secretary, and Treasurer. The treasurer for accounting for cash was a contribution of 100 shillings weekly by members. The collections are saved in a group account. The savings are essential as one can access loans from the group and pay within the set time. These loans enable members to diversify into farming activities, buying another motorcycle, business loans, and school fee loans. In situations of distress like hospital and funerals fee, members voluntarily contribute a set amount apart from the savings of the group.

This motorcycle operation is an unavoidable means of transport in the area. The majority of traders are ferried by motorcycles into interior parts of villages and shopping centres along the main road. Students also use this means of transport as they travel far distances to school, especially the secondary schools, which are limited in number compared to primary schools. Patients are also ferried to hospitals and from treatment to their homes. Other freight ferried includes milk from the farms, eggs, and agricultural products such as avocados, maize, mangoes, and farm inputs such as fertilisers and dairy feeds.

- The members have expressed concerns about poor intra-village access as a large percentage of interior tracks are inaccessible during rainy seasons. They recommended that the county government should champion the allocation of a portion of Road Fuel Levy and insurance charges to take care of this important rural access network.

- COVID pandemic prevention is a major concern in transport services. Therefore, there is a need for well-structured sheds complete with latrines, water, and hand sanitisation/liquid soaps in major stopping junctions and shopping centres. This could protect them from rain and also enhance the prevention of virus transmission among operators and passengers.

- The lack of competent motorcycle mechanics is an opportunity that can be taken up by youth undergoing training in basic mechanical courses for self - employment.

8.3 Impact of COVID in Kenya and East Africa

The South Africa Rand Merchant Bank states that Kenya has a strategic location as a regional transport hub for landlocked Uganda, Rwanda, Burundi, Democratic Republic of Congo (DRC) and South Sudan. Thus, experts warn that the effects of the recent cancellation of ships scheduled to dock at the port of Mombasa are bound to reverberate across the East African region.

Meanwhile, on 20th March 2020, the Ministry of Health made a statement about the capacity of public service vehicles (PSV) to maintain social distance requirements and limit COVID transmission:

1. 14 seaters should carry a maximum of 8 passengers
2. 25 seaters to carry 15 passengers
3. 30 seaters and above to carry 60% of its current capacity

The contravention of the directives would lead to termination of PSV licenses.

8.4 COVID-19 impact on transport fares

Source: Star Newspaper

A spot check by the Star newspaper indicated that many routes have increased passenger fares, in some instances doubling the fares. "Matatu" crews are also required to sanitise their vehicles and to provide hand-washing equipment to all passengers. Most Public Service Operators stated that the increase was purely to cover the transport costs lost as a result of minimised passenger numbers

Figure 12: A city bus with an advisory on the new fares for passengers

Source: Courtesy of Star Newspaper.

Figure 13: Passengers sanitise their hands before boarding a matatu on March 16, 2020

Source: Image by Daniel Ogendo

8.5 COVID-19 Impact on Two and Three-Wheelers

Source: Transaid

Curfews introduced across East Africa, aimed at minimising physical contact, have severely impacted the livelihoods of two and three-wheeler operators. The widespread closure of business and schools has resulted in a severe drop in patronage, whilst riders in Tanzania and Kenya have been limited to working during daylight hours. In Uganda, a previously enforced 2 pm curfew for boda boda, three-wheeler, and bicycle taxis was recently extended to a total ban except for some cargo. Boda boda and three-wheeler riders in Kenya are limited to carrying either one passenger or one item of cargo at a time. Similarly, in DRC, motorcycle and three-wheeler riders have been restricted to carrying one and two passengers respectively. The subsequent banning of large gatherings, and the further closure of markets and transport terminals, has displaced many boda boda riders, meaning they risk harassment or arrest for conducting business away from their designated stages.

Figure 14: A hand washing station installed at a boda boda rank in Kenya

In Kenya, riders and passengers have been instructed to wear face masks, but riders have complained about a lack of PPE, and many have expressed anxieties about contracting Covid-19 but have little choice other than to keep working. At the beginning of the outbreak there were several reports of hand washing and sanitising stations being installed in transport terminals, along with some sensitisation efforts by local NGOs, transport unions and other groups, but many of these in-kind donations appear to lack the support of a cohesive government strategy to be maintained long-term. Meanwhile, PicMe App, a Ugandan ride-share company, has appealed for pilot funding to try fitting plastic screens between riders and their passengers.

Figure 15: Plastic Screen for boda boda transporters

The authorities in Kenya and Uganda have threatened to revoke licenses and confiscate motorcycles from riders found to be ignoring curfews and sanitary directives. However, local media has reported several violent confrontations between riders and the police, resulting in riders and sometimes their passengers being killed or seriously injured. Vigilante mobs have also been accused of enforcing curfews with violence. MPs in Kenya and Uganda have appealed to 'loans men' not to confiscate motorcycles from boda boda riders who are unable to keep up with repayments.

Kenyan police have accused boda boda riders of illegally carrying passengers and cargos in and out of restricted areas, including Nairobi, Mombasa, Kwale, and Kili districts. Since the banning of motorcycle taxis in Nigeria earlier this year, scores of okada riders have travelled to Ghana in search of work. Ghana's Ministry of Information has reported detaining several Nigerian nationals near the Aflao boarder for either entering the country illegally or smuggling people from Togo. Ghana has equally expressed concerns about okada riders facilitating the unregulated movement of people and goods between Ghana and Cote d'Ivoire from the Brong Ahafo region.

It appears that some people are now not comfortable using motorcycle taxis due to fears of contracting Covid-19. However, people still need to travel to buy food, make essential trips, or to get to health facilities and the boda-boda continues to serve communities in this regard. It is also probable that as more people fear travelling to health facilities or even to markets (as lock-down become more widespread) they will rely increasingly on boda bodas to deliver medicines and essential supplies to their door.

8.6 Proposed Mobile Fare Payment System in Kenya

Source: Paul Wafula, Nation Media

In the future, it is proposed that commuters pay bus fares through mobile money transfers to limit cash transactions, to curb the spread of COVID-19. A partnership between Safaricom and several public transport sector operators has been established to accept cashless payments through M-Pesa. The proposal is not yet enacted into law and is still subject to debate.

Safaricom said on Monday that the service has already been deployed to more than 300 City Star Shuttle vehicles in Nairobi and will be rolled out to additional players in the coming days, helping them further comply with the government's recommendations to combat the spread of coronavirus.

Many countries have closed their borders and imposed curfews – resulting in sharp reductions in transport demand at a regional and continental level. It is highly likely that the coronavirus outbreak will have longer-term impacts on our behaviour and lifestyle, the way we work, consume, and travel. Public transport and shared mobility services are vectors for transmission of the virus. On the other hand, they are severely impacted by travel bans and individual concerns to avoid public gatherings leading to plummeting ridership and reduced travel and transport demand.

Even though not yet to be finally assessed, the economic impact of the virus outbreak in the public transport and shared mobility sector (e.g. ride-hailing, ride-pooling, scooter-sharing) is most likely severe. As public transport is directly linked to economic development and dependent on fares and subsidies, loss of revenue is most likely inevitable. Besides the loss of revenue, higher costs for frequent cleaning of vehicles and facilities or increased train frequency over a long time can put additional financial burdens on public transport companies. Shared mobility service providers such as Uber, Lyft, Ola, Grab or Didi Chuxing are suffering economic losses from plummeting demand leading to increasing financial pressure and risks for the so-called gig-economy workers and in particular drivers.

Need for Protection of Staff, Infrastructure and Passengers

Employees are the most important assets in public transport. They must, therefore, be given special protection, both as individuals and in their function as drivers, supervisors, managers, etc. It is like things that employees in public transport have close contact with passengers. International associations like the Transport Research Board (TRB), the American Public Transport Association (APTA) and the International Organisation for Public Transport Authorities and Operators (UITP) provide factsheets and general information about protecting passengers and public transport staff from COVID-19.

9 Conclusions

The study commenced with the interpretation of the Terms of Reference and analysis. This was followed by a literature review and a site visit. The objective of the study was to collect data on the fares of public transport on low volume rural roads for comparison with fares of public transport along major arterial roads. This was based on the Rural Transport Premium (*Fares per passenger -kilometre on LVRR relative to fares of long-distance buses plying the national roads*). The findings indicated that the Rural Transport Premium has reduced from a ratio of 5 in 2014 to 2.3 in 2020. This is attributed to reduced vehicle operating costs and increased demand for travel, with a higher frequency of transport services as a result of improvements in road infrastructure, as well as reduced trip duration due to the improved road condition. All these factors have contributed to a reduction in LVRR fares, as compared with inter-city bus fares. Low Volume Rural Road improvements in the region have led to reduced travel time, higher frequency of commercial vehicle operation, and mobility. However, during the lockdown measures implemented following the COVID-19 outbreak, the Rural Transport Premium increased to 3.5, which demonstrate how sensitive transport fares on LVRR are to fluctuations in demand related to COVID and related lockdown measures.

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Annex: List of Interviewees

NAME/DESIGNATION	AGENCIES IN NAIROBI	LOCATION
1) Agnes Wanjiru	Mathioya SACCO representative	Murang'a
2) Antony Maina	Road construction	Murang'a
3) David Waiganjo - Gitugi sub chief-	Education and security	Murang'a
4) Dominic Maina	Mathioya Sacco driver	Murang'a
5) Edwin Macharia Agro – Business Specialist	Cooperative College Graduate	Murang'a
6) Joy Karimi	Muranga lands officer	Murang'a
7) Joyce Wamagi	Coffee grower	Murang'a
8) Julius Pal	Student	Murang'a
9) Maina Joseph	Vehicle Maintenance	Murang'a
10) Maina Magajo	Motorcycle SACCO representative	Murang'a
11) Peter Kamau	Gitugi Motorcycle Association	Murang'a
12) Susan Wangari	Petrol station attendant	Murang'a
13) Engineer in charge of project road	Nyoro Construction Company	Muranga
14) Abel Onenga	Kisii Long-distance bus worker	Nairobi
15) Coast Bus Services	Nairobi -Mombasa	Nairobi
16) Fredrick Maina -Accountant & Transport Owner	Mechanical & Transport dept	Nairobi
17) Fredrick Osiyo	Miran Insurancee	Nairobi
18) Guardian Bus Services	Nairobi – Kisumu and Kisii	Nairobi
19) Joseph Wanjohi - Regional Manager	KeRRA – Murang'a	Nairobi
20) Kelvin Kihoro	Muranga University	Nairobi
21) Nicholas Kibe-Transport Economist	KeRRA - Nairobi	Nairobi
22) Officer in Charge	Easy Coach Bus Service	Nairobi
23) Peter Gichohi - Research Director	KeRRA - Nairobi	Nairobi
24) Richard Wambugu - Senior Roads Superintendent	KeRRA -Murang'a	Nairobi
25) Simion Kefa	Transline Bus Service	Nairobi
26) Francis Otunga - Agro – Business Specialist	Cooperative College Graduate	Nairobi