Ride Hailing Survey: Usage of App-Based Mobility Services in Nairobi, Kenya

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Prepared by
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Project Background

The Advancing Transport Climate Strategies (TraCS) project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and funded through the International Climate Initiative of the German Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU). Its objective is to enable policy makers in partner countries (Vietnam, Kenya and Morocco) to specify the contribution of the transport sector to their respective Nationally Determined Contributions (NDCs) and Longterm Low Greenhouse Gas Emission Development Strategies (LTS). In addition, detailed knowledge on mitigation potential can lead to raising the level of the countries' ambitions.

TraCS supports ministries of environment and transport and other relevant authorities in systematically assessing GHG emissions in the transport sector and calculating emission reduction potential through the development of scenarios. TraCS also assists with the development and implementation of associated climate policy measures. At the international level, TraCS organises active exchanges between implementing partners, technical experts, and donor organisations to enhance methodological coherence in emission quantification in the transport sector.

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EXECUTIVE SUMMARY

The ride hailing study was done with the aim of understanding how new transportation technologies are changing the way people travel. A similar study has previously been conducted in Beijing, Mexico City, Mumbai and Sao Paulo, using similar methodologies and questionnaires. In Nairobi, the same questionnaire used in other cities was used, but was slightly adjusted after the pilot survey, to incorporate the local setting. On average, an interview took 35 minutes, with an average response rate of 65% (potential respondents reached vs. successful interviews).

The study was done through face to face quantitative interviews, targeting all the constituencies in Nairobi. However, to incorporate views from a large population that works or travels to and from Nairobi, but live in the outskirts of the city and are geographically considered part of neighbouring counties, we also targeted some areas of Kiambu county e.g. Kinoo and Kikuyu, parts of Machakos county e.g. Athi River and parts of Kajiado county e.g. Ongata Rongai. In total, a **sample of 2,540 interviews** were achieved, which was proportionately distributed across the constituencies, guided by the 2019 population statistics. The following is a map showing the study areas (colours do not stand for anything);

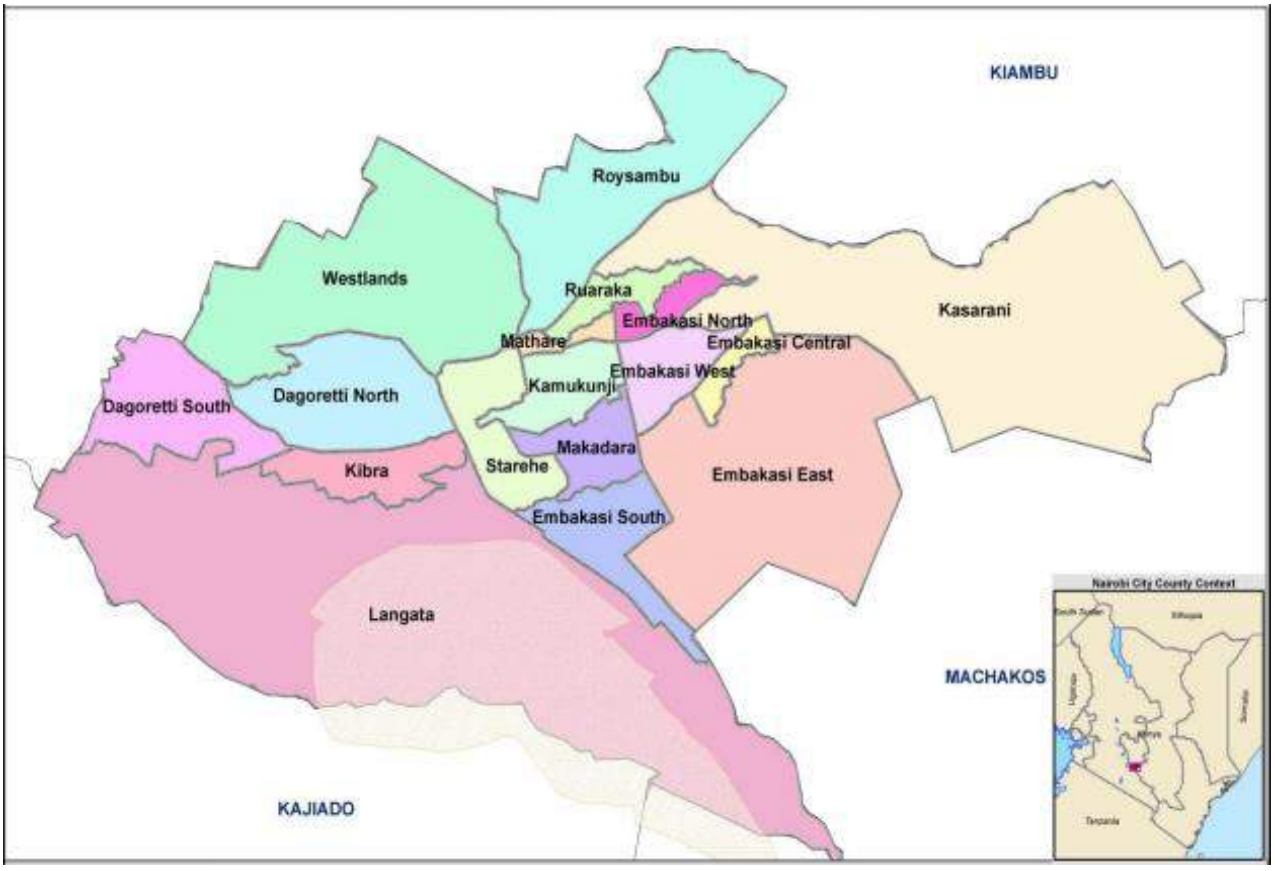

Figure 1: Nairobi City County map

Summary of findings

Age and gender splits were done in accordance with the population statistics of Nairobi. The sample was comprised of 51% women and 49% men, of which 39% were in the age brackets of 26-35 years', 24% were 18-25 and 6% were over 55 years. As for income distribution, just about 45% of the respondents were in the lower income group (USD[1] 200 or below), about 50% in the middle-income group (USD 201 – USD 1,500) and the remaining (about 5%) fall in the high-income group (more than USD 1,501).

Smartphone ownership was found to be very high, with 86% of the respondents reporting to own a smartphone. Majority of these prefer buying data packages on need basis, as opposed to having a monthly subscription to data. Having a reliable internet connection is very important to the respondents, as per the 80% level of importance rating reported for the statement *"Having Wi-Fi and/or cell phone data connectivity everywhere I go is essential to me."*

More than half the respondents (55%) reported to travel for at least 6 days, for work/school related purposes, while 30% reported that they travel for 5 days a week. With this high demand for transport services, matatus[2] and walking were mentioned as the most frequent modes of transport used, with matatu mentioned by 59% as the primary mode of travel while 85% mentioned walking as the secondary mode of travel. The high percentage for walking as a secondary mode can be attributed to the fact that many people use walking to supplement other modes of travel, either to access their offices/school after being dropped at bus stops or even to access the bus stops from their homes.

Travel time, travel cost and waiting time were considered key factors in influencing the travel mode of choice, as stated by 85%, 83% and 75% of the respondents respectively.

The usage of ride hailing services was high, with 58% of the respondents reporting to having used the services before. In comparison with other cities where the study has been conducted, Nairobi compares as shown in the table below on ride hailing usage;

[1] The USD - KES conversion used in the report is a very rough estimate of 1:100

[2] Matatus are privately owned minibuses or vans that act as the primary mode of public transport

Table 1: Ride hailing usage comparison

City	Ride hailing usage
Sao Paulo	70%
Mumbai	63.4%
Nairobi	58%
Beijing	57.4%
Mexico City	50.5%

Source: WRI Ross centre

Majority of those who indicated usage of ride hailing services were digital taxi users at 80%, followed by digital boda boda[3] users at 17%. Digital taxis were the pioneers in the industry back in 2015, thus more established than the other digital modes of travel. The average distance covered in the last trip made by digital taxi users was 15.1 kilometres, while that of shared digital taxis, digital boda boda and digital buses was 15.4km, 5.2km and 13.2km. This is in comparison to a 2016 study that estimated the average trip in Nairobi to be 10.2 Km for private cars and 9.1 Km for public transport.

The usage of ride hailing services was mainly over the weekends, with half of the users (53%) indicating usage of the services over the weekend (Friday-Sunday). However, usage of digital buses was spread across the entire week.

[3] Boda bodas are motorcycle taxis

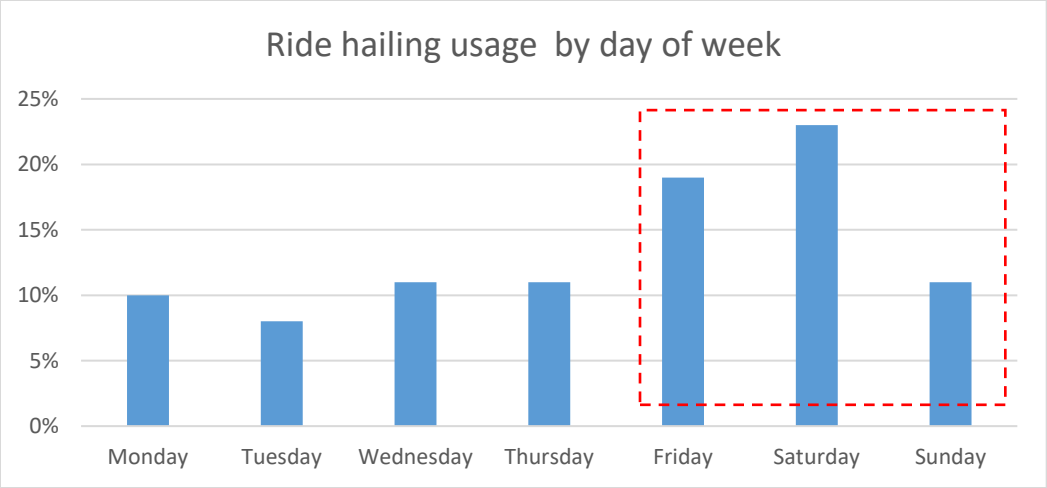

Figure 2: Ride hailing usage by day of week

The preferred mode of payment for services provided was in cash, as indicated by 63%, followed by mobile money at 33%. However, for digital bus users, E-wallet was the most preferred. For most people, usage of ride hailing services was for unofficial purposes (social/recreational trips) as indicated by 58% of users. This was followed by 36% who stated the trip was work/school related.

The most likely alternative to digital taxi services was public transport (48%); this is mainly because matatus are readily available in all areas of Nairobi, in most areas operating on a 24-hour basis. In the digital taxi category, Uber was the most popular (69%), followed by Taxify/Bolt (21%) and lastly Little Cabs (10%). In the digital boda boda category, Safe Boda was the most popular (52%), while in the digital bus category Little Shuttle was the most popular (77%), ahead of its only other competitor in the category-SWVL (23%).

Generally, there has been an impact of ride hailing services on other modes of transport. The biggest impact has been on traditional taxi and traditional boda boda, with 35% of ride hailing users saying they use traditional taxi services less often. On the other hand, 40% of traditional boda boda users indicated they use traditional boda boda less often. In the case of matatus, the impact has not been very hard, with 74% indicating they use matatus about the same as before. This is mainly because digital taxis (the dominant mode among ride hailing services), have not been direct competitors to matatus, since they are not in the same space. However, the situation

for matatus could change, if the digital bus services expand as they will be operating in the same space.

1.0. INTRODUCTION

In view of emerging mobility trends in Kenya and to further build on availability of transport data in the country, the "Advancing Transport Climate Strategies" (TraCS) project sought the services of the Pan African Research Services to carry out a survey on digital taxi usage, specifically in the capital city of Nairobi.

TraCS is implemented by the German Development Cooperation (GIZ) on behalf of the German Federal Ministry for the Environment Nature Conservation and Nuclear Safety (BMU), in cooperation with the Kenyan State Department of Transport (SDoT). The project supports the SDoT in institutionalising its climate change functions as stipulated in the Climate Change Act of 2016 as well as supporting requisite policy and action design work. These efforts are geared towards creating sustainable conditions for the sector to implement the National Climate Change Action Plan (2018-2022) and achieve its Nationally Determined Contribution (NDC) target.
For the duration 2018-2021, the project focuses on four work packages, including; development of a climate change strategy, monitoring and reporting, capacity building and networking, and outreach. These packages have been identified and prioritized by the climate change coordination unit at the State Department of Transport in cooperation with GIZ.

The study is supported under the monitoring and reporting component of the project. This covers activities around data collection and improvement of the sector's knowledge base. These have covered both road user experience and vehicle fleet characteristics and have resulted in a clear understanding of the active fleet in the country, level of availability of transport data in the country, and have provided an insight into the sector's emission profile.

1.1. Overview of digital mobility applications in Kenya

Globalization has enhanced communication channels which has resulted in proliferation of technology, capital and skill.

Global Positioning System (GPS) has had significant implications on transport systems. Innovations and advanced growth in technologies related to Global Positioning System (GPS) has had a major contribution to growth in automated transport systems.

The introduction of E-hailing applications in the taxi industry is one of the technological innovations in the recent past. E-hailing simply refers to the process of sourcing for a taxi or other forms of transport using a mobile application. The sourcing of the taxi is facilitated by a mobility service provider, otherwise known as a Transport Network Company (TNC), that matches the request with a vehicle registered to its platform. E-Hail applications services have created high competition in the taxi industry through increased supply and readily available cars and drivers in major cities.

E-hailing companies such as Uber, Taxify and Little Cab developed out of the foresight that differentiating the aspects of the conventional taxi business model would increase both efficiency and profits. Conventional taxi businesses consisted of a fleet management system that handled vehicle tracking, allocation and pricing, and an operations management system that worked to ensure vehicles were in good working condition and that drivers offered clients impeccable customer service.

E-hailing services have grown rapidly as more passengers enrol for the services. There has also been increase in the number of operators and the increased coverage for the zones served by the taxi operators.

Players in the industry

E-hailing/Digital taxi business has attracted quite a number of players which has resulted in greater competition hence more supply of digital taxis and drivers in Kenya. According to an article published on weetracker.com, the most popular and dominant players in the e-hailing service are as shown below:

Figure 3: Popular taxi apps in Kenya;

Source: WeeTracker[4]

However, the above list is subject to change since new players keep emerging from time to time, the latest 2 having launched in September & October 2019; An-Nisa Taxi, whose target clientele is women & children, and Peppea which is owned & operated by a Kenyan vehicle motor dealer/seller, Maridady motors.

Regulations

Africa Renewal, which is an e-magazine produced by United Nations Department of Global Communications, cited in 2017 that many African governments seemed to have been surprised by this development in the transportation sector and were rushing to put regulatory policies in place, with Ghana being the first to do so in 2016 by signing an SOU (Standard of Understanding) with UBER. The SOU provided holistic guidelines for taxi operations and encouraged the use of technology but regulated it for riders, drivers and companies.

In Kenya, the regulatory body, National Transport and Safety Authority (NTSA), has been working on draft regulations for what is being referred to as digital vehicle hailing service rules, 2020. This

[4] https://weetracker.com/2019/09/19/digital-taxi-pricing-dilemma-faced-by-drivers/

latest draft was as a result of 2 companies introducing a new service still under the umbrella of e-hailing, whereby a customer can book a seat on a mass transit bus. The 2 companies are SWVL (an Egyptian bus transportation company) & Little Shuttle (owned and operated by Little Cab- a Kenya company). The draft regulations are mainly focused on pricing & licensing and include the following provision as well;

- E-hailing companies should have physical presence in the country
- E-hailing companies to have identifying markers different from private vehicles and other public service vehicles
- The companies should also be registered as digital hailing companies instead of transport companies
- Drivers should also be required to work for a maximum of 8 hours

Challenges

Just like any other business, e/digital hailing has its challenges, the most notable being competition. E/digital hailing has attracted many players into the industry and as such has also resulted in evolution of the service, i.e. the players (both old & new) have had to introduce/invent new variations to the initial e/digital hailing concept.

Competition in this industry, as expected, has led to price wars i.e. the companies end up lowering their prices (which are per kilometre) so as to attract more customers and get an edge over their competition. Price wars which result in general low prices negatively impact vehicle owners' & drivers' earnings(https://www.standardmedia.co.ke/article/2001333877/drivers-protest-poor-taxi-pay-rates). For most operators, traffic or time duration of a ride is not necessarily considered when calculating actual cost of the trip.

This has however impacted the drivers and vehicle owners negatively, since the price cuts usually affect their commission. This in turn has resulted in drivers going on strike/go slow in order to protest the same.

Insecurity has also affected this service, in that some of the companies offering this service have had to withdraw their services in selected places at selected times due to high likelihood of carjacking and or armed robberies targeting both the drivers and users/customers of the e/digital taxis.

Other challenges include long working hours for the drivers to maximize on profit and the need to maintain cars of high standards (model and general maintenance). There is also the challenge of direct competition from conventional operators for both passengers and drivers.

Developments

Overtime, new and target specific services have been introduced, these include;

- The introduction of e/digital hailing in mass public transport (SWVL & Little Shuttle)
- An e/digital hailing service that focuses only on women & children (e.g. An-Nisa)
- An e/digital hailing service that focuses/targets/operates in regions where the top players have not yet ventured (e.g. Wasili which is active in Nakuru and Eldoret).

2.0. BACKGROUND TO THE STUDY

This details the objectives of the study and the approach used to meet the objectives. The sample distribution is also explained under this section.

2.1. Objectives of the study

The key objective of the survey was to understand how new transportation technologies are changing the way people travel. The study is part of an international study conducted in other cities i.e. Beijing, Mexico City, Mumbai and Sao Paulo. As such, similar data collection tools were used as in other cities, with slight adjustments made to suit the setting in Nairobi city.

2.2. Approach and methodology

The study was conducted through face to face quantitative interviews in all the constituencies of Nairobi and close outskirts that are considered part of Nairobi due to the large population of Nairobi's working force in the areas. The respondents were identified through street intercepts, whereby interviewers were placed at strategic locations where they could approach potential respondents.

Time

Data collection for the study was done between 6th December and 17th December 2019, which included training of the enumerators, piloting and actual data collection. Successful data collection was followed by coding, data review and analysis.

Limitations

The study went on as planned, without any major limitations. However, the following minor limitations were encountered in the course of the study;

- For some respondents, remembering the exact details of their trips for example, day of the week, amount paid and waiting time was a challenge, as their last trip could have been several days before. To counter this limitation, we requested them to check the trip details from their trip information on the application. Where this was not possible, we asked them to give the closest approximate they could think of, even guided by other trips they had made before.

- Another challenge was trip distance approximation as some respondents could not get the distance right. On this, they were also asked to give the closest approximate of the trip distance. However, this was also revisited during data cleaning, where the consultant was able to give a more accurate approximate based on the trip information i.e. origin and destination of trip.

Apart from these minor limitations, the study went on smoothly and as planned.

Sample

A total sample of 2,540 was achieved, which was distributed proportionately across the constituencies in Nairobi and surroundings. The sample was based on the area of residence of the respondent. The surroundings included areas close to Nairobi, but which administratively are not considered part of Nairobi County. These constituted a total sample of 429 respondents, and included the areas of Ruiru, Kabete, Mavoko, Kajiado North and Kikuyu. The following table shows the sample achieved per constituency;

Table 2: Sample distribution by county and constituency

Constituency	County	Sample	Constituency	County	Sample
Roysambu	Nairobi	178	Starehe	Nairobi	70
Kasarani	Nairobi	194	Embakasi South	Nairobi	133
Ruaraka	Nairobi	101	Embakasi North	Nairobi	76
Mathare	Nairobi	195	Embakasi Central	Nairobi	70
Makadara	Nairobi	151	Embakasi West	Nairobi	136
Dagoretti North	Nairobi	135	Embakasi East	Nairobi	175
Dagoretti South	Nairobi	182	Ruiru	Kiambu	134
Langata	Nairobi	76	Kikuyu	Kiambu	166
Kibra	Nairobi	130	Kabete	Kiambu	90
Westlands	Nairobi	78	Mavoko	Machakos	15
Kamukunji	Nairobi	31	Kajiado North	Kajiado	24
Total sample: 2540					

3.0. MAIN FINDINGS

The findings from the survey are discussed in line with the objectives of the survey.

3.1. Demographics

Gender distribution

Gender considerations in the sample were guided by the population statistics for Nairobi, from the 2019 Kenya National Bureau of Statistics population data. As such, we used the sex ratio to allocate the sample for male and female respondents. The achieved sample has 49% male and 51% female respondents.

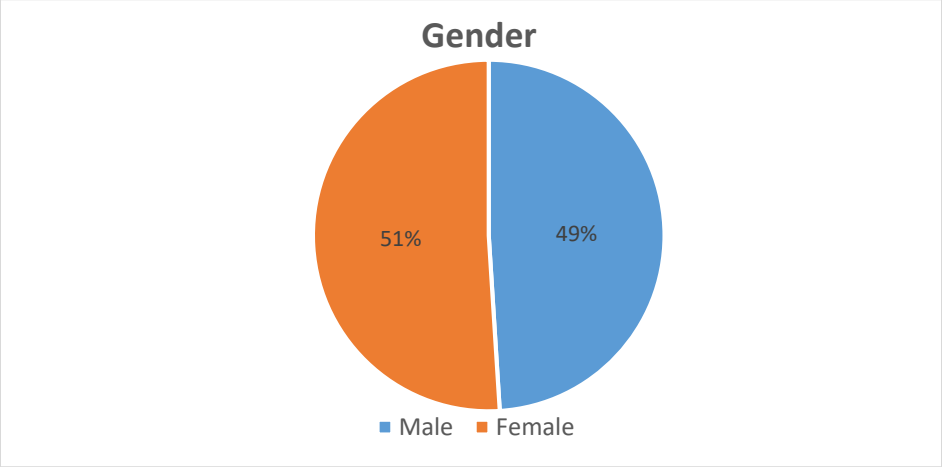

Figure 4: Gender distribution in the sample population

Age distribution

The age distribution was also done according to the population statistics from the Kenya National Bureau of Statistics. It was done as shown below, with the age group '26-35 years' constituting 39% of the sample, followed by '18-25 years' at 24%. Expectedly, the age group 'over 55 years' had the lowest representation, constituting 6% of the sample. This is as illustrated in the chart below;

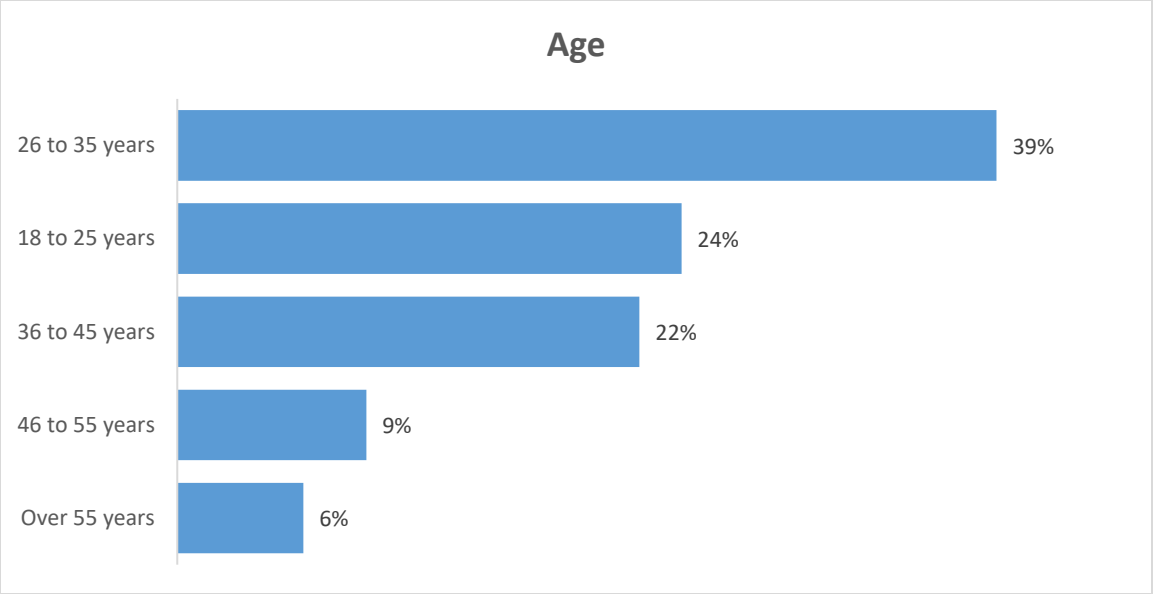

Figure 5: Age distribution

The table below shows the age distribution for Nairobi population according to data from KNBS. The gaps in the age groups don't exactly match those in the chart above but are indicative of the age distribution in Nairobi.

Table 3: Nairobi age distribution (2019 KNBS data)

Age group	Percentage
0-10	22%
10-20	16%
20-30	30%
30-40	18%
40-50	8%
50 and above	5%

Level of education

Nairobi, being Kenya's capital has better education facilities than other counties across the country. The county also boasts of many institutions of higher learning, accommodating learners from across the country. From the sample achieved, only 8% indicated not to have completed high school education. Overall, 68% of the respondents indicated they had acquired some tertiary education from different institutions of higher learning. This is as shown in the chart below.

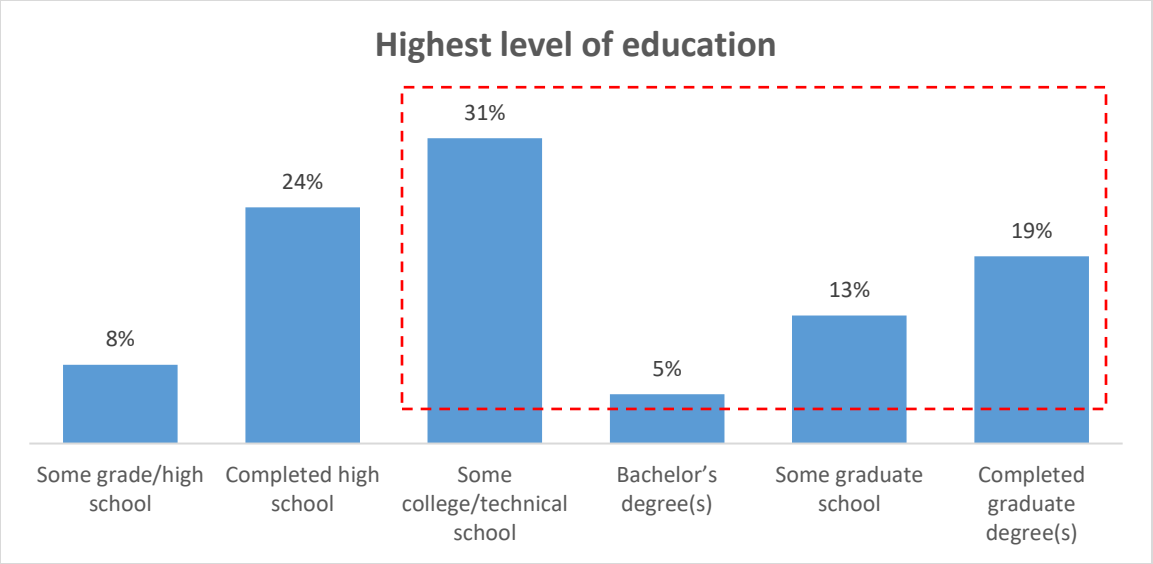

Figure 6: Education level

Level of income

The monthly income for the respondents was also assessed. This was the amount one is left with after deductions e.g. tax, NSSF and NHIF-that is the net pay. According to data from a 2018 study by the Kenya National Bureau of Statistics, 74% of salaried Kenyans earn less than KES 50,000 (USD 500). Though the scope of the KNBS study is different from our study (in terms of geographical coverage and only targeting salaried employees), it is indicative that majority of Kenyans earn KES 50,000 (USD 500) and below. In this study, majority of the respondents indicated that their monthly income was below KES 50,000 (USD 500), with 44% earning between KES 0 to KES 20,000 (USD 0-200) and 42% earning between KES 21,000 and KES 50,000 (USD 210-500). This is as shown below.

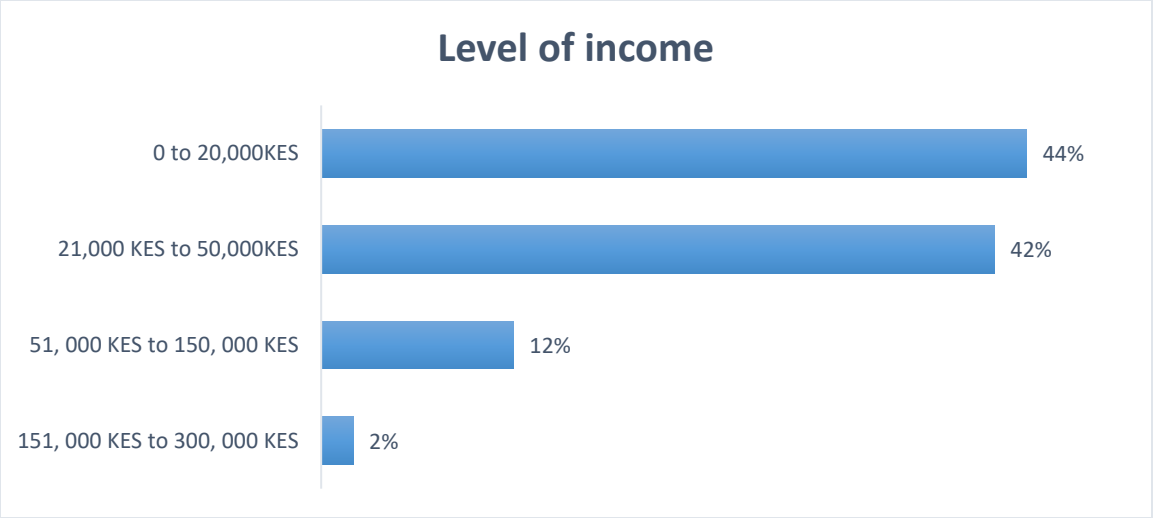

Figure 7: Level of income

Smartphone ownership

According to a 2019 report by Deloitte[5], Kenya has one of the highest smartphone penetration rates in Africa at more than 90%, competing with South Africa and Nigeria. Overall, 86% of the respondents indicated ownership to a smartphone, with majority of these (78%) indicating they don't have a recurring data plan, but instead buy non-recurring data packages whenever they want to connect to the internet (buy data packages on need basis). Only 8% indicated they have a pre-paid or monthly subscription to data. Overall, only 14% said they did not own a smartphone.

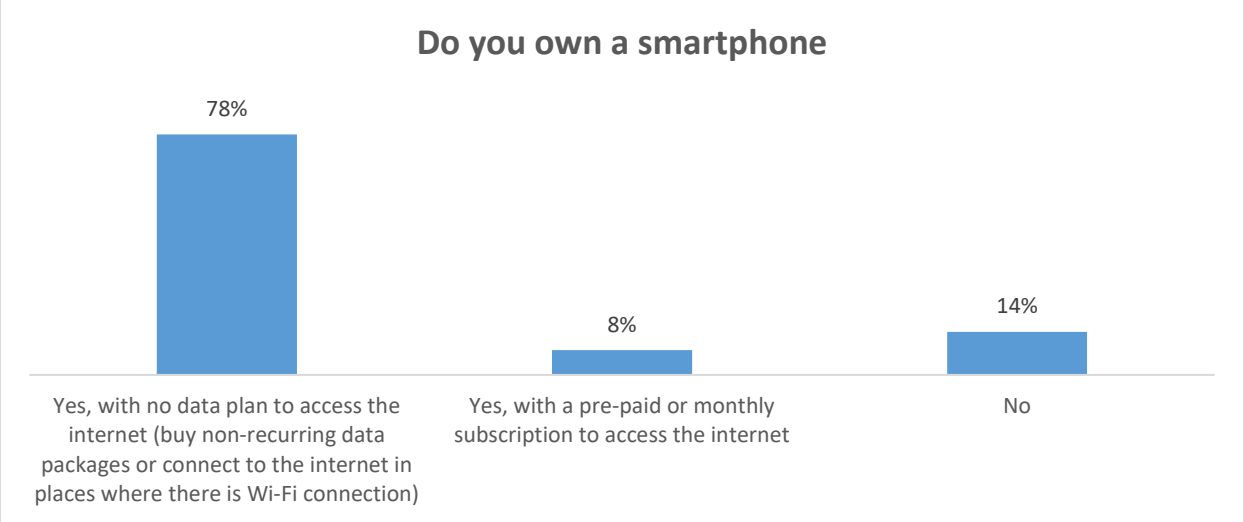

Figure 8: Smartphone ownership

[5] Global Mobile Consumer Survey-Deloitte

Household size

In the 2019 National Census, the average household size for Nairobi was 2.9 members. In this study, the average household size was 3.2, with an average of 1.1 members who are below the age of 18. The average number of HH members with a driving license was 0.7. This is shown in the table below.

Table 4: Household information

Household size (average)	HH members under 18 years	HH members with driving license
3.2	**1.1**	**0.7**

Share of ride-hailing users

Overall, 58% of the respondents indicated to having used ride hailing services in the past. Most of the users belong to the income category below 50,000 KES (USD 500), as shown by a combined 82% of the users. Only 2% of income category 151,000-300,000 KES (USD 1,510-3,000) indicated to using digital taxi services, which is explained by the likelihood of them owning personal cars. The ride hailing usage is also skewed towards younger people, with two thirds (66%) of the users being below 35 years. These statistics are as shown in the table below;

Table 5: Ride hailing usage by Age and Income distribution

	Have used the services	Never used the services
Total	**58%**	**42%**
By level of income		
0 to 20,000KES (USD 0-200)	36%	55%
21,000 KES to 50,000KES (USD 210-500)	46%	35%
51, 000 KES to 150, 000 KES (USD 510-1500)	16%	8%
151, 000 KES to 300, 000 KES (USD 1510-3000)	2%	2%
By Age		
18 to 25 years	25%	23%
26 to 35 years	41%	36%
36 to 45 years	22%	22%
46 to 55 years	8%	10%
Over 55 years	4%	9%

The statistics above can also be confirmed by the analysis below of income by age group, whereby income below KES 50,000 (USD 500) was dominated by respondents below 35 years, while above KES 150,000 (USD 1,500) was mainly dominated by those above 35 years of age. This is shown below;

Table 6: Income level vs. age

Income	18 to 25 years	26 to 35 years	36 to 45 years	46 to 55 years	Over 55 years
0 to 20,000KES (USD 0-200)	41%	38%	13%	5%	3%
21,000 KES to 50,000KES (USD 210-500)	14%	43%	27%	10%	6%
51, 000 KES to 150, 000 KES (USD 510 - 1,500)	2%	30%	33%	20%	16%
151, 000 KES to 300, 000 KES (USD 1,510 – 3,000)	0%	13%	43%	20%	25%

Employment status

The following chart shows the employment status of the respondents, where 43% indicated to having a full-time job, while 16% indicated to having no work at all.

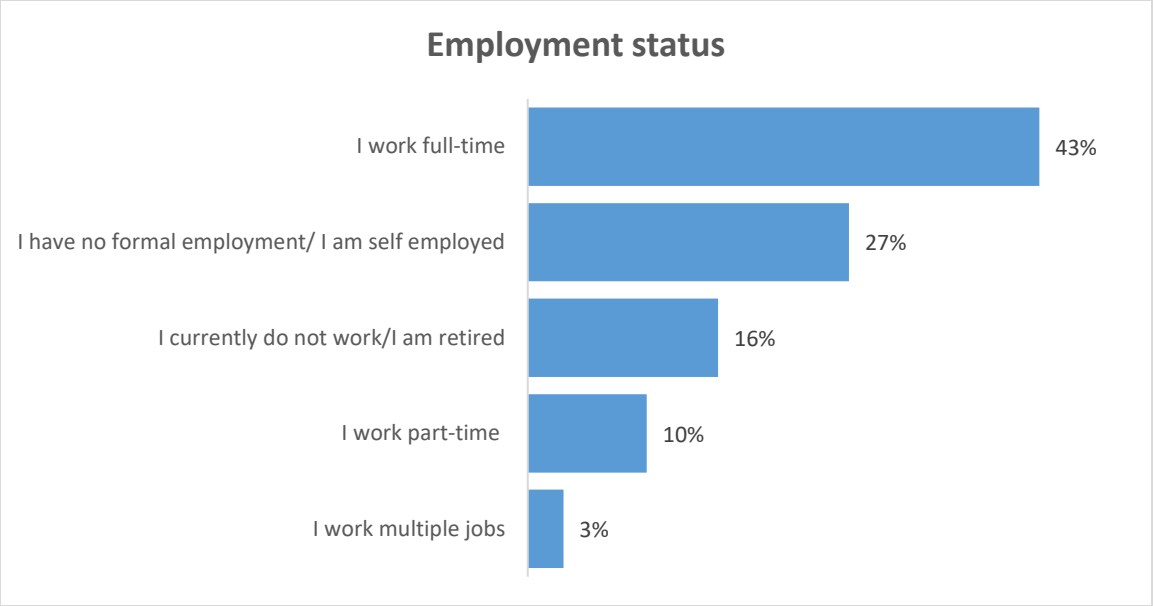

Figure 9: Employment status

3.2. Opinion on topics: Level of agreement

In the study, respondents were asked their level of agreement on various statements which were read to them by the enumerators. They then proceeded to rate their level of agreement on a scale of 1-5. The scores were then converted to a percentage showing the level of agreement with the statements. The statement "I definitely want to own a car or motorcycle" had a 90% level of agreement, which was highest amongst the statements presented to the respondents. On the other hand, the statement "Government should provide funding for better public transportation, even if this means raising the price of petrol or diesel" had the lowest rating at 60% level of agreement, indicating the unwillingness of the people to bear the burden of increases in oil prices, which in most cases causes a ripple effect on the price of other consumable goods. There were no significant differences in the ratings of the attributes by gender. Levels of agreement on all the statements is as shown in the table below.

Table 7: Level of agreement

	Level of agreement		
Statement	Male	Female	**Total**
I definitely want to own a car or motorcycle	90%	90%	**90%**
Having Wi-Fi and/or cell phone data connectivity everywhere I go is essential to me.	86%	86%	**86%**
I like trying things that are new and different	86%	84%	**86%**
I am committed to an environmentally friendly lifestyle	86%	86%	**86%**
I am uncomfortable being around people I do not know.	72%	74%	**74%**
Government should provide funding for better public transportation, even if this means raising the price of petrol or diesel.	60%	60%	**60%**

3.3. Travel characteristics

3.3.1. Days travelled in a week (To work or school)

The study sought to get information on the number of days people travel for work or school related activities in a typical week. Overall, most of the respondents (55%) indicated that in a typical week, they travelled for 6 days for work or school related activities. This was followed by 30% who indicated they travel for 5 days in a typical week. A tenth of the respondents (11%) indicated they travel all the days of the week (7).

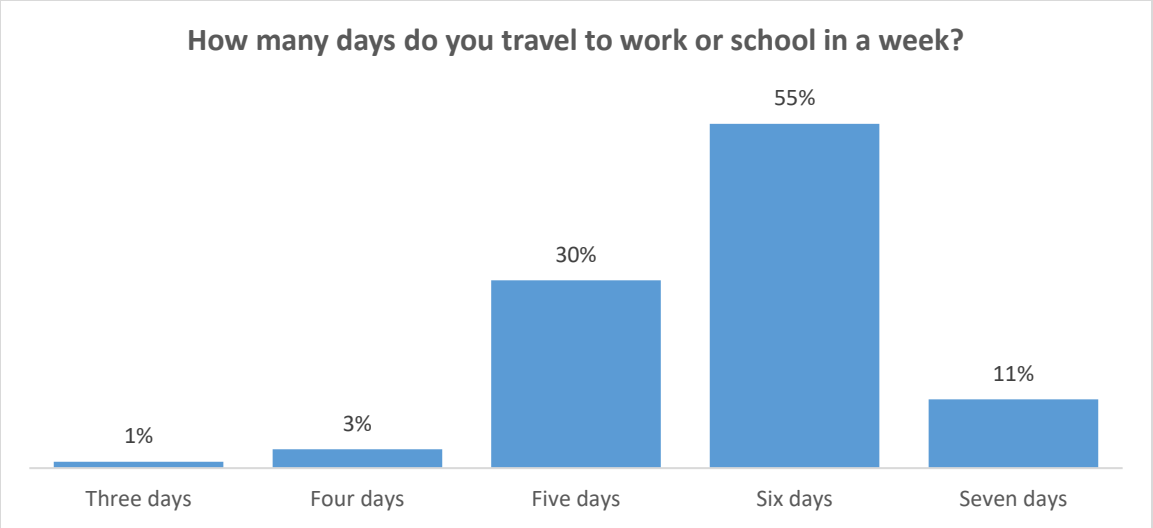

Figure 10: Days travelled in a week

3.3.2. Frequency of usage

Transport patterns were studied by asking the respondents which means of transport they used to make their day to day trips and the frequency of use. For this section, the study specifically focused on trips made for work or school purposes.

Personal motorcycles and bicycles were the least available means, as stated by 84% and 75% of the respondents respectively. The use of trains, personal cars and digital buses e.g. SWVL was also limited by availability, as indicated by 63%, 61% and 53% of the respondents respectively. The most frequently used modes of transport were walking and matatu. Walking was used by 53% of the respondents 5 or more times in a typical week, while matatus were used by 47% of the respondents 5 or more times a week. Digital taxis were found to be readily available, with only 5% indicating they are not available for them. However, 60% of the respondents indicated that despite being available, they do not use the option. At the same time, 23% indicated they use the digital taxis at least once a month.

Table 8: Mode of transport and frequency of usage

	Frequency of usage						
Transport mode	*Not available*	*Available but I never use it*	*Less than once a month*	*1-3 times a month*	*1-2 times a week*	*3-4 times a week*	*5 or more times a week*
Personal car, or someone else's car	61%	20%	3%	2%	2%	2%	10%
Personal motorcycle	84%	10%	1%	1%	1%	1%	3%
Bus	17%	34%	11%	10%	11%	9%	9%
Train	63%	32%	2%	1%	1%	0%	1%
Matatu	1%	15%	3%	6%	10%	18%	47%
Traditional taxi	10%	74%	9%	5%	1%	1%	0%
Digital taxi (e.g. Uber, Taxify, Little Cab)	5%	60%	12%	16%	5%	1%	1%
Bicycle	75%	22%	1%	1%	1%	0%	1%
Walking	0%	15%	4%	6%	12%	10%	53%
Tuk tuk	43%	41%	6%	4%	4%	1%	1%
Traditional boda boda	10%	52%	12%	12%	8%	4%	2%
Digital buses, digital matatus (SWVL and Little Shuttle	53%	44%	1%	1%	0%	1%	0%
Digital Boda boda	23%	65%	4%	7%	1%	0%	0%

3.4. Primary and secondary modes of transport

Primary mode

Modes of transport used to complete the day to day trips were further categorized into primary and secondary modes. Primary mode refers to the mode used to cover the longer section of the trip. The secondary mode refers to the mode used to a lesser extent in completing a trip. An example is where one takes a matatu from home to a bus stop near his workplace, a distance of 5km, then takes a boda boda for 200 metres to get to the office. In this case, matatu is the primary mode while boda boda is the secondary mode.

From the study, matatu was picked by most respondents as the primary mode of transport, as stated by 59% of the respondents. This was followed at a distance by personal car which was selected by 12% as the primary mode, while bus was selected as the primary mode by 10%. Digital taxi was selected as the primary mode by 2% of the respondents. This is as shown in the chart below;

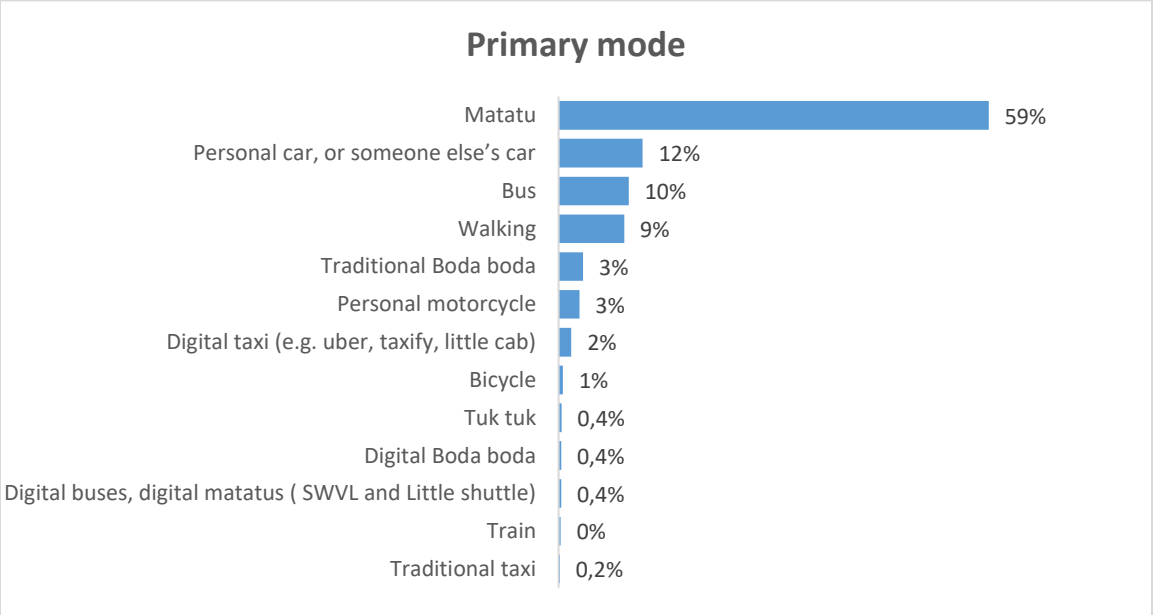

Figure 11: Primary mode of transport

Secondary mode

Walking was identified as the secondary mode of transport by 85% of the respondents, making it the most common secondary mode of transport. This is attributed to the fact that most commuters using public transport modes alight close enough to their places of work or school,

thus making walking the most convenient mode to complete the trip. Matatu was mentioned by 5% as the secondary mode, while boda boda and bus were each mentioned by 3% of the respondents as secondary modes to complete their trips. This is as shown in the chart below;

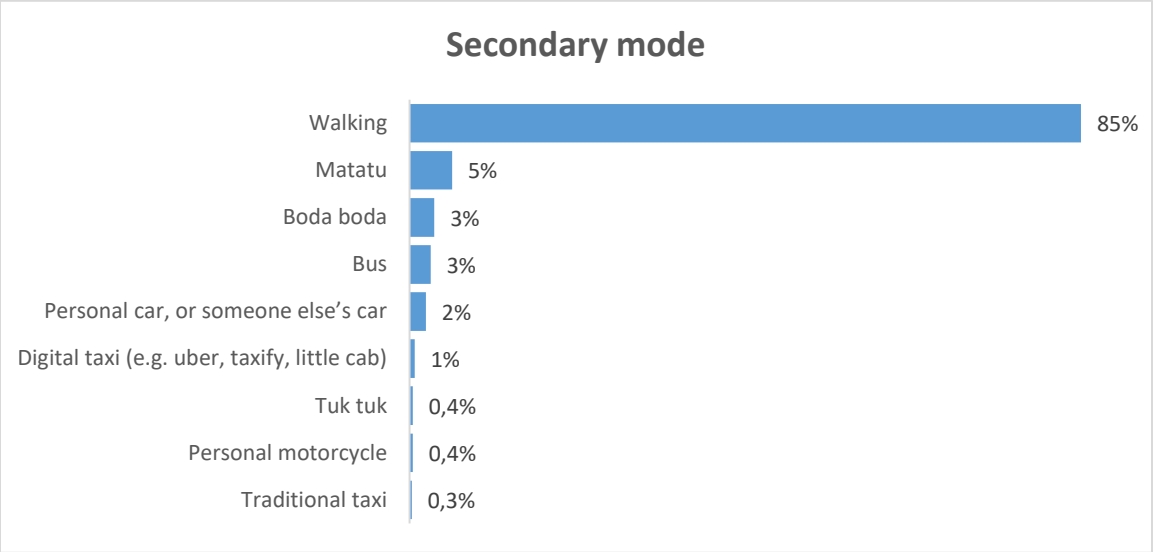

Figure 12: Secondary mode of transport

3.5. Factors affecting choice of trip

Commuters make their choice for the transport mode to use based on various factors. The study assessed the level of importance of these factors, so as to understand the factors that drive choice. Travel time and travel cost were mentioned as very important factors, with the level of importance being 85% and 83% respectively. Safety of the mode and personal security were both rated at 78% level of importance, while waiting time and reliability of transport time were each assigned an importance level of 75%. The presence of strangers next to someone while making a trip, which is associated with privacy was the least rated in terms of importance, with 55% level of importance. This shows that for most commuters, the presence of other commuters travelling with them isn't a factor that greatly influences their transport decisions.

This is as shown in the table below;

The level of importance rating was arrived at by calculating the mean rating per attribute, and converting it to a percentage.

Table 9: Factors affecting choice of trip

	Not applicable	***Not at all important***	***Slightly important***	***Moderately important***	***Extremely important***	***% level of importance***
Travel time	5%	5%	12%	19%	59%	**85%**
Travel cost	7%	6%	14%	18%	55%	**83%**
Waiting time	14%	8%	21%	20%	36%	**75%**
Reliability of travel time	4%	9%	23%	23%	40%	**75%**
Safety (of the vehicle)	9%	8%	20%	19%	44%	**78%**
Security (from harassment, getting mugged)	4%	10%	21%	19%	46%	**78%**
Comfort	5%	12%	26%	26%	32%	**70%**
Presence of stranger(s) next to me	10%	31%	25%	18%	16%	**55%**
Difficulty of finding parking	67%	6%	6%	4%	17%	**75%**
Ability to carry things with me	5%	13%	25%	25%	32%	**70%**
Ability to do things while traveling (*e.g.* read, use a smartphone)	7%	22%	28%	21%	22%	**63%**

3.6. Means of transport for non-official trip (Leisure/shopping/social trips e.g. social outings, shopping, visiting friends or family)

Having studied transport characteristics for work and school related activities, the study also sought to understand how the respondents make non-official trips that is leisure/shopping/social trips. These include social outings, shopping and visiting friends or family.

For non-official trips, walking is the most preferred, followed by matatu. The frequency of usage of transport modes to make non-official trips is as shown in the table below.

Table 10: Transport mode vs. frequency of usage

	Frequency of usage						
Transport mode	***Not available***	***Available but I never use it***	***Less than once a month***	***1-3 times a month***	***1-2 times a week***	***3-4 times a week***	***5 or more times a week***
Personal car, or someone else's car	10%	39%	7%	19%	8%	6%	11%
Personal motorcycle	31%	39%	5%	11%	5%	3%	5%
Bus	3%	43%	22%	16%	7%	6%	3%
Train	13%	76%	6%	2%	1%	0%	1%
Matatu	0%	17%	10%	25%	21%	12%	14%
Traditional taxi	3%	76%	13%	6%	2%	0%	0%
Digital taxi (e.g. Uber, Taxify, Little Cab)	2%	53%	17%	22%	5%	1%	0%
Bicycle	28%	64%	3%	1%	1%	1%	2%
Walking	0%	15%	7%	14%	21%	12%	31%
Tuk-tuk	6%	65%	12%	6%	6%	3%	2%
Traditional boda boda	4%	51%	16%	16%	8%	4%	2%

Digital buses, digital matatus (SWVL and Little Shuttle	9%	84%	3%	2%	1%	0%	0%
Digital Boda boda	3%	80%	6%	9%	1%	0%	1%

3.7. Emerging transport services

This section explores usage of E-hailing services in Nairobi in more details.

3.7.1. Ride hailing usage

Ride hailing is an emerging and rapidly growing mode of transport in Kenya, more so in the capital city, Nairobi. Overall, 58% of the respondents indicated that they have used ride hailing services, which represents those who have used digital taxis, digital boda boda and digital buses/shuttles. However, digital taxis make up the biggest percentage of ride hailing services users, as it was the pioneer in the industry and thus more established than the other ride hailing modes.

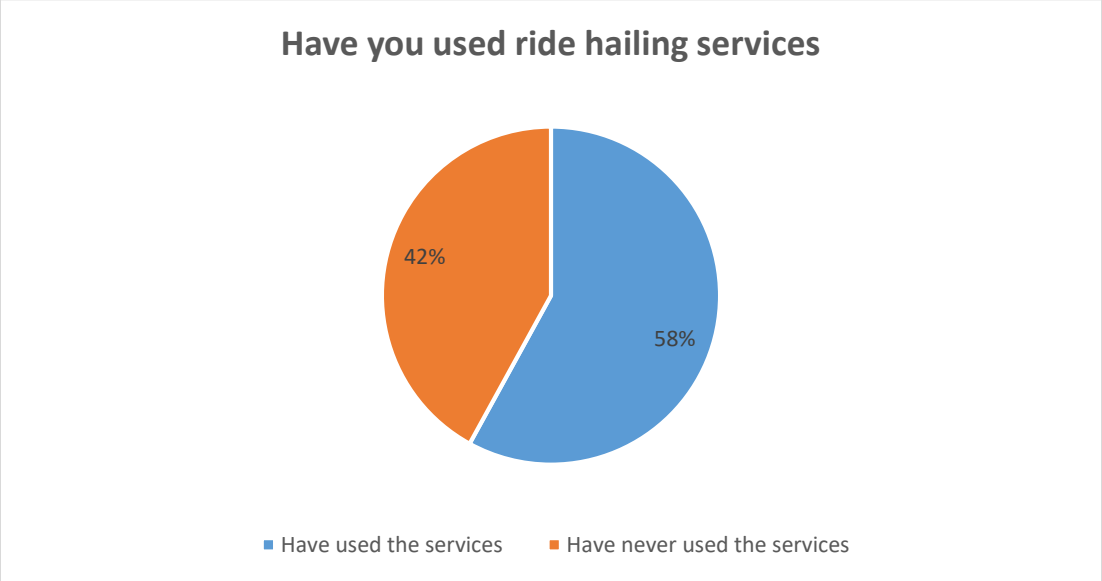

Figure 13: Ride hailing usage

3.8. Ride hailing services: Based on the last trip made

3.8.1. Type of service used for the trip

To confirm the dominance of digital taxis over other digital modes of transport, the respondents who indicated usage of digital services were further asked to mention the digital mode they last used, whereby 80% indicated they had used of digital taxi. A further 17% said they had used

digital boda boda, whereas shared digital taxi and digital buses/shuttle had a 2% and 1% usage among the respondents. This is shown in the chart below. ***However, it was noted that the respondents' reference to shared digital taxis meant sharing a digital taxi e.g. Uber and then splitting the cost. As such, they were not referring to sharing/carpooling apps, which didn't get mentions in the study.***

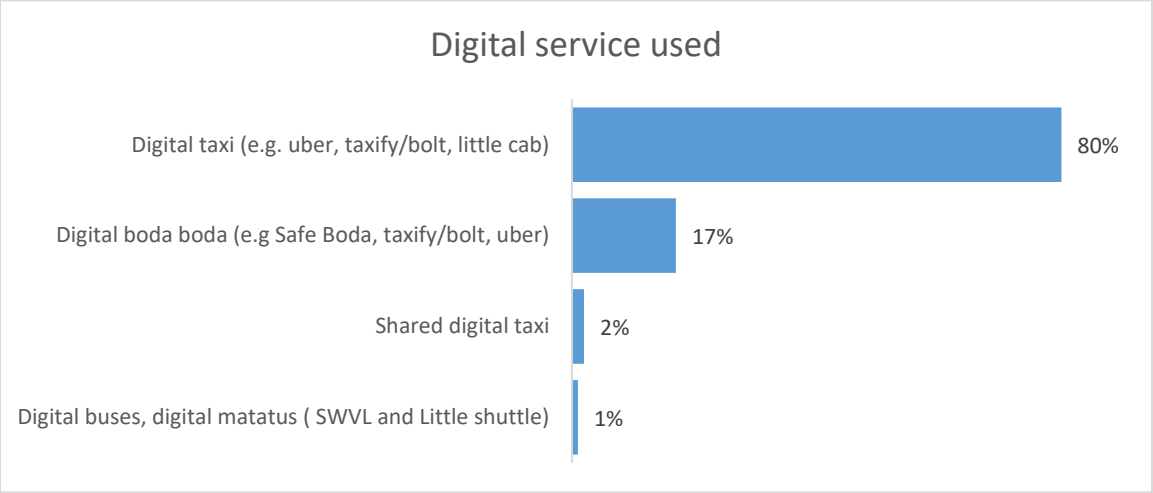

Figure 14: Digital mode used

3.8.2. Distance covered

On average, the distance covered varied depending on the mode of ride hailing service used. Digital taxi users had covered an average of 15.1km in their last trip, whereas shared digital taxi users had covered 15.4km. Digital boda boda had covered an average distance of 5.2km, while digital buses/shuttle had covered an average of 13.2km in their last trip. This is shown below;

Table 11: Distance travelled

Service used	Digital taxi (e.g. Uber, Taxify/Bolt, Little cab)	Shared digital taxi	Digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)	Digital buses, digital matatus (SWVL and Little shuttle)
Average no. of Kms covered	15.1	15.4	5.2	13.2

3.8.3. Day of the week the service was used

The study also sought to establish the days of the week which ride hailing services are likely to be used. The users were thus asked to mention the day of the week they had used the digital

mode of transport, in reference to the mode they had chosen. Overall, usage was skewed towards weekends that is from Friday-Sunday. For digital taxis and shared taxis, most users indicated usage from Friday-Sunday, with more usage on Saturday. Usage of digital boda and digital buses was spread across the week, though usage of digital boda was higher on Saturday. Digital buses usage was mainly during the weekdays/working days and higher on Friday as compared to the other days. The usage per day across the different digital modes of transport is as shown in the table below.

Table 12: Digital service used vs. day of week used

	Total	Digital taxi (e.g. Uber, Taxify/Bolt, Little Cab)	Shared digital taxi	Digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)	Digital buses, digital matatus (SWVL and Little shuttle)
Monday	10%	8%	3%	20%	23%
Tuesday	8%	6%	9%	15%	15%
Wednesday	11%	11%	0%	11%	15%
Thursday	11%	11%	18%	9%	0%
Friday	19%	20%	24%	12%	31%
Saturday	23%	23%	27%	23%	8%
Sunday	11%	13%	18%	4%	0%
Can't recall	7%	8%	0%	7%	8%

3.8.4. Time taken waiting for the ride

The use of ride hailing involves placing a request on the mobile application, followed by an approval from the service provider that the request has been approved and a ride assigned. This is followed by communication between the driver/rider and the customer/user, on the pickup point and other details. Then the user waits for the ride to arrive. The wait varies depending on many factors e.g. traffic, availability of drivers/riders in the area, weather, accessibility of the pickup point among others. As such, the study sought to establish the average waiting time for

each ride hailing mode used. On average, digital boda boda had the shortest waiting time, at 4.4 minutes. This can be explained by the fact that boda bodas are more mobile than cars, as they are able to navigate traffic easier than cars and are also able to access pick up points easier than cars. Average waiting time for digital taxis was 7.2 minutes while that of shared taxi and digital buses was 7.5 minutes for both. This is as illustrated in the table below.

Table 13: Average waiting time

Service used	Digital taxi (e.g. uber, Taxify/Bolt, little cab)	Shared digital taxi	Digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)	Digital buses, digital matatus (SWVL and Little Shuttle)
Average waiting time	7.2	7.5	4.4	7.5

3.8.5. Duration and cost of trip

The average duration of trip for digital taxi users was 31 minutes, similar to shared digital taxi which was also 31 minutes. The average cost of trip for digital taxi was 597 KES (~ USD 6), while that of shared taxi users was 526 KES (~ USD 5.2). The average cost of shared taxi refers to the total cost paid by all those who shared. The average duration of trip for digital boda boda was 12 minutes, with the average cost of trip being 187 KES (~ USD 1.8). The average duration of trip for digital bus users was 39 minutes, with the average cost of trip being 95 KES (~ USD 1). This is as shown below;

Table 14: Duration and cost of trip

Service used	Digital taxi (e.g. uber, Taxify/Bolt, little cab)	Shared digital taxi	Digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)	Digital buses, digital matatus (SWVL and Little Shuttle)
Duration of trip (Minutes)	31	31	12	39
Cost of trip (KES)	597	526	187	95

Comparing duration of trip above with average time taken per trip shows that the time per km for digital taxi and shared digital taxi is 2.0 minutes per km, compared to 2.3 minutes per km for

digital boda boda. Expectedly, boda boda is faster when there is heavy traffic, as they can easily navigate through traffic. However, in cases where there is no traffic, the taxi will move faster than the boda boda. Taxis are also preferred for longer distances as compared to boda bodas which mainly cover shorter distances. As such, the time per km for taxis and boda bodas will vary depending on traffic, distance and other factors. As such, they are not directly comparable. The time per km for digital buses is higher at 2.9 mins per km, since the bus has many users and thus has many stops before reaching the final destination.

Table 15: Time per km

Service used	Digital taxi (e.g. uber, Taxify/Bolt, little cab)	Shared digital taxi	Digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)	Digital buses, digital matatus (SWVL and Little Shuttle)
Duration of trip (Minutes)	31	31	12	39
Average no. of Kms covered	15.1	15.4	5.2	13.2
Time per km	**2.0**	**2.0**	**2.3**	**2.9**

3.8.6. Mode of payment

Mode of payment for the services was also studied, whereby payment via cash was dominant. Overall, 63% of the ride hailing users indicated that they use cash to make payment for the service, followed by mobile money which was chosen by a third of the respondents (33%) as the preferred payment mode. E-wallet was mentioned by 4% overall, while other modes such as credit/debit cards had very little mentions. Payment mode for different digital service users is as shown below.

Table 16: Mode of payment

	Total	Digital taxi	Shared digital taxi	Digital boda boda	Digital buses, digital matatus
Cash	63%	59%	64%	84%	31%
Credit Card/Debit card	0.3%	0.3%	0%	0%	0%
E Wallet	4%	3%	3%	2%	38%
Mobile money e.g. Mpesa	33%	37%	33%	14%	31%
Corporate Clients/Company paid	0.1%	0.1%	0%	0%	0%

3.8.7. Purpose of the trip

The purpose of the trip was also explored in the study. Since usage of digital services had a skew towards weekends, it is expected that the trip purpose was un-official. This was confirmed by 58% of the users, who indicated that the purpose of their trip was to/from social/recreational activities. These may include a social outing, entertainment and other recreational activities. Usage for work/school purposes was mentioned by 36%, while shopping was mentioned by 21%. The purpose of trip mentioned are as illustrated in the chart below;

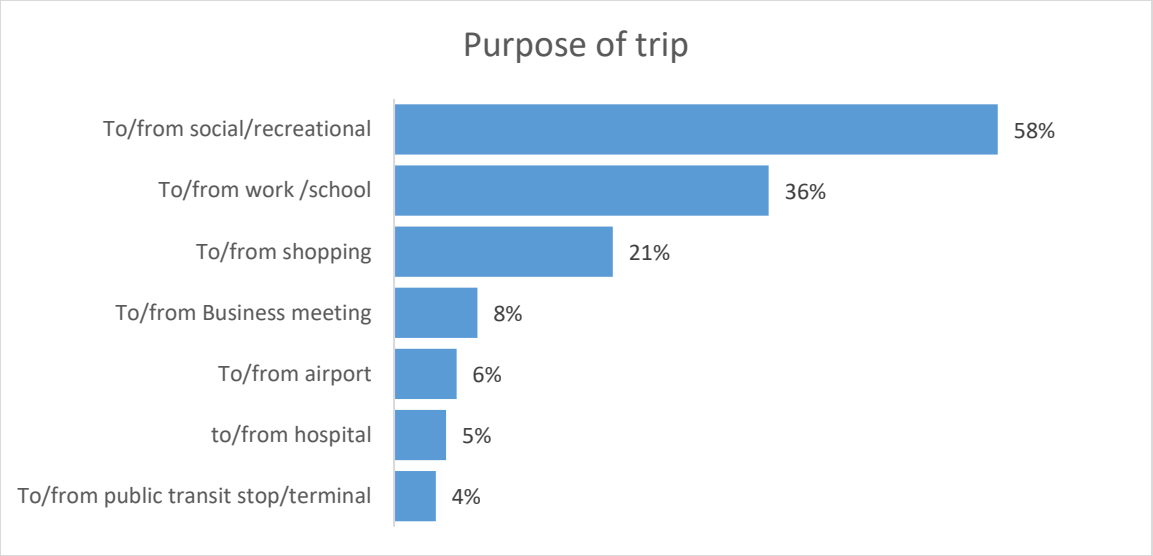

Figure 15: Purpose of trip

3.8.8. Number of travellers in the trip

On average, 54% of digital services users indicated they had taken the last trip alone, as the only travellers in the car/boda boda they had requested for. Another 44% indicated that they had made their last trip in the company of family members/friends/colleagues. The average number of family members/friends/colleagues in this trip was 2.5~3. Lastly, 1% indicated they had made their last trip matched together with other users e.g. in the case of shared digital taxi or digital buses. On this, the average number of travellers was 13, with the highest being 30 (SWVL) and the lowest being 3 travellers.

Table 17: Number of people in a trip

	How many people travelled with you	No of family members/friends/ colleagues	No. of other travellers matched via the app
I was the only traveller	**54%**	-	-
With family members, friends or colleagues	**44%**	2.5 ~ 3 (average)	-
With other travellers matched via the app	**1%**	-	13 (average)

3.8.9. Why did you use this service for your trip?

People use ride hailing services for different reasons. For most people, the reasons are related to convenience in terms of time, safety and other factors. Overall, 75% of users indicated they use digital services to save time while moving from one point to another, while half of the respondents (50%) indicated safety as the reason why they prefer this mode of transport, while better comfort was mentioned by 40% of the respondents. Generally, ride hailing modes are more expensive than other modes, especially over long distances. However, digital buses/shuttles are cheaper than the normal matatus, taxis and even personal cars thus 62% of the digital bus users indicated the reason for their preference is saving money. Digital buses are cheaper because their prices are controlled by the app, unlike the direct competitors like matatus whereby the price is determined by the operators depending on many factors e.g. demand, weather and time of day. The reasons for preference of different modes of transport are as shown below.

Table 18: Reason for usage

	Total	Digital taxi	Shared digital taxi	Digital boda boda	Digital buses, digital matatus
To save time	75%	72%	73%	89%	62%
To safely get around	50%	53%	67%	37%	31%
Better comfort	40%	46%	45%	11%	54%
More personal safety/security	27%	31%	52%	5%	8%
To save money	19%	21%	12%	9%	62%
To avoid parking hassles	7%	8%	9%	2%	0%
Avoid harassment	7%	9%	3%	3%	0%
Public transit was not available	6%	7%	0%	4%	0%

To avoid impaired driving (e.g. drinking and driving)	5%	6%	6%	1%	8%
Private vehicle was not available	4%	5%	0%	0%	0%

3.8.10. Alternatives to ride hailing services

Alternative modes of transport to digital services were explored, whereby the users were asked which alternatives they would have resulted to in case the preferred digital mode was not available. This was broken down depending on the preferred mode of ride hailing services i.e. digital taxi, shared taxi, digital boda and digital buses.

Alternatives to digital taxi

In the event that digital taxis were not available, 41% of the users indicated they would go for a matatu, with the likely reason being that matatus are readily available in all areas of Nairobi. Traditional taxi was mentioned as an alternative by 20%, while personal car/someone else's car was mentioned by 11%. A tenth of the users indicated traditional boda boda would also be an alternative in the event the digital taxi was not available. This is as shown in the chart below.

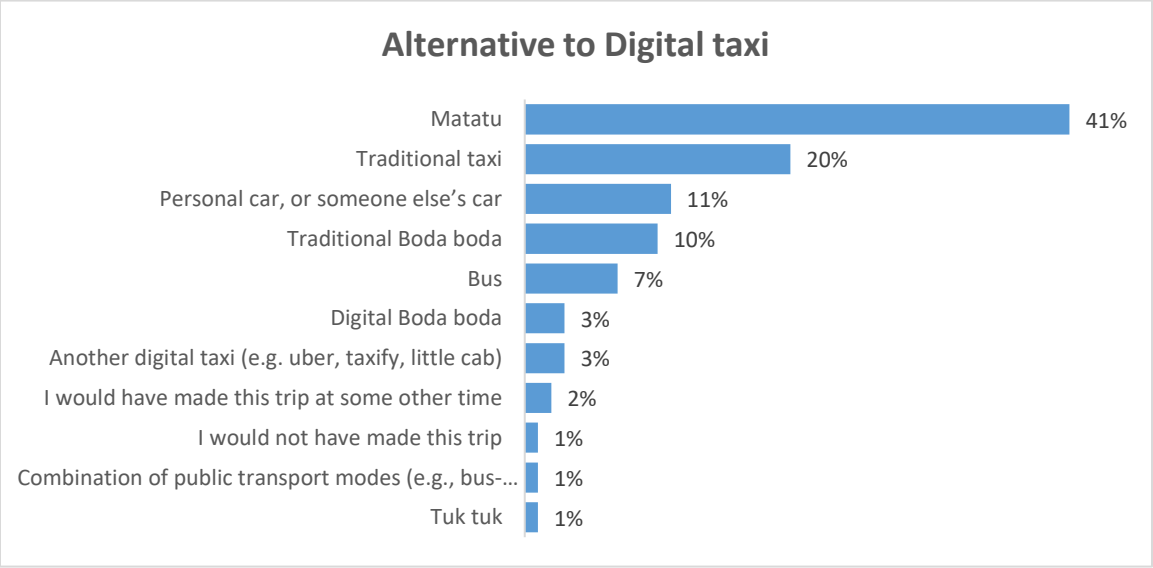

Figure 16: Alternatives to digital taxi

Alternative to shared digital taxi

Alternatives to shared digital taxi are similar to the users of digital taxi, with 21% indicating matatu as an alternative. However, another 21% also indicated that they would go for digital taxi (unshared) in the event that they were not able to secure a shared digital taxi. In this context, this means they would opt to hail the taxi on their own (without sharing). Another 15% indicated they would have postponed the trip for another time, while 12% indicated they would go for traditional taxi services. These and other alternatives are as illustrated in the chart below.

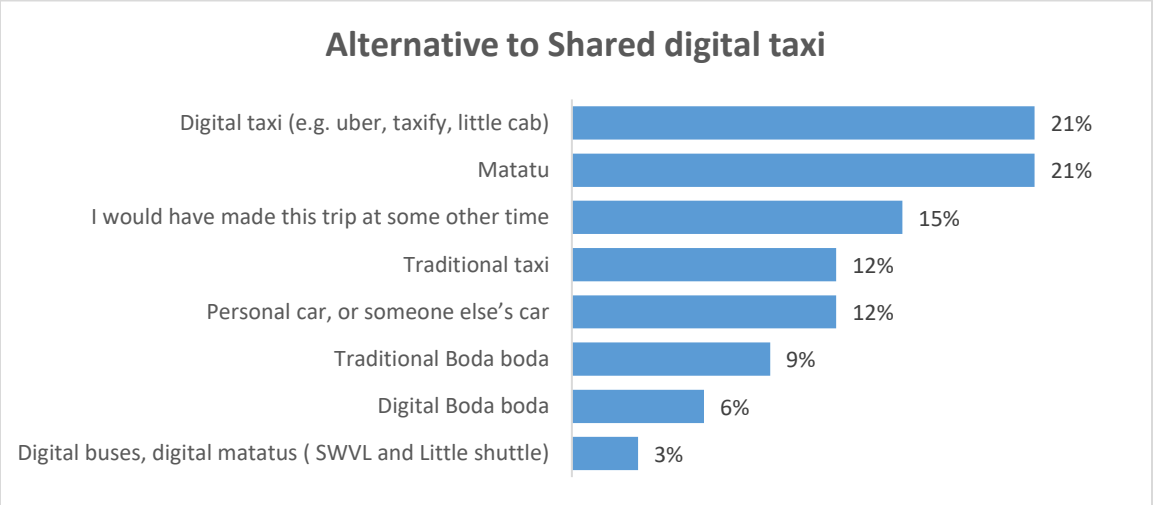

Figure 17: Alternatives to shared taxi

Alternative to digital boda boda (e.g. Safe Boda, Taxify/Bolt, Uber)

Alternatives to digital boda boda services were also explored, where two thirds of the users (66%) indicated their alternative mode of transport would be matatu, in the event digital boda boda services were not available. Another 13% indicated they would go for traditional boda boda, while 8% would go for digital taxi services.

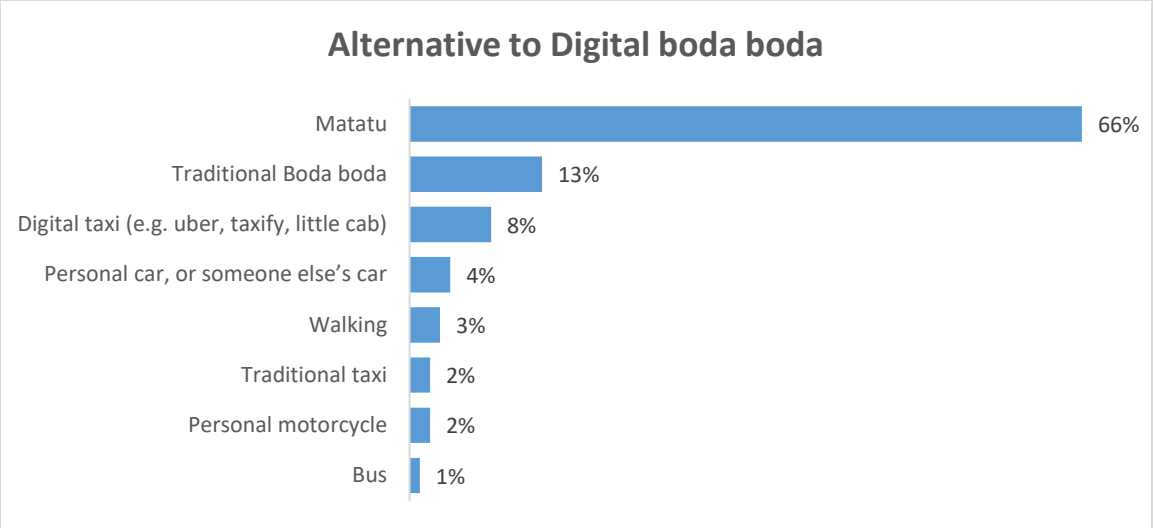

Figure 18: Alternatives to digital boda boda

Alternative to digital buses, digital matatus

Majority of digital bus users would result to the available public transport means i.e. matatu and bus, as indicated by 84% of digital bus users. This is broken down to 69% who would opt for matatus and 15% who would opt for buses as alternatives. This is shown below.

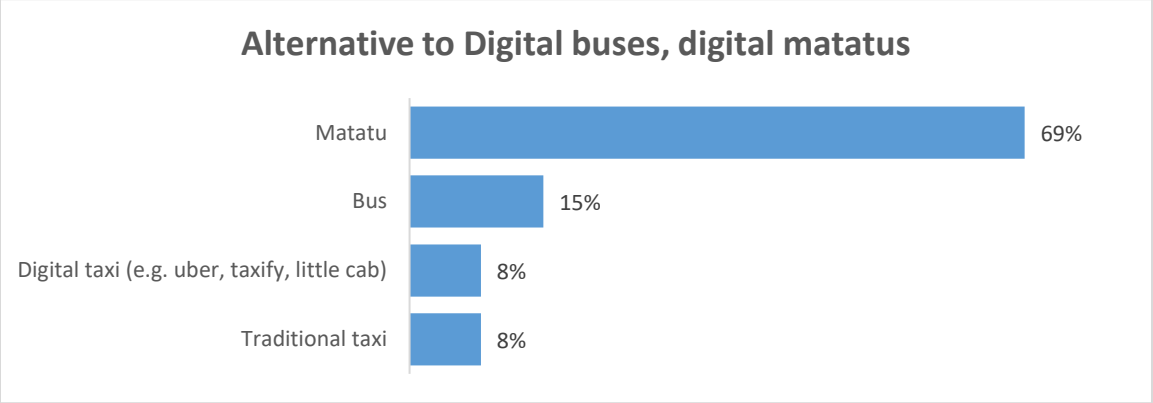

Figure 19: Alternatives to digital buses

3.9. Likes and dislikes about digital taxis

To establish some of the strengths and weaknesses of digital taxis, the study sought to know the likes and dislikes of digital taxis. This was asked in relation to their overall experiences using the services, either before, during or after the trip.

Likes about digital taxis

Digital taxis are liked for several reasons, among them being;

- Saves on time
- Convenient
- Comfortable
- Safer
- Efficient
- Cost effective with time
- Professional drivers /experienced drivers
- Privacy
- Easily available

Dislikes about digital taxis

Some of the aspects customers don't like about digital taxis include;

- Price fluctuations
- Un-availability upon request
- Sometimes insecure
- Some drivers have a bad attitude/ rude driver /unprofessional drivers/drunk drivers
- Expensive / expensive especially on short distances / expensive due to traffic jams
- Trip cancellations
- Sometimes they take too long to respond to a request
- Limitations of accessing the app/can only be accessed through smart phones
- The drivers talk too much/nagging drivers
- Network going down mid-trip
- Slow speeds so that the price can be higher

3.10. Service providers

The study sought to establish the key players in the ride hailing services, for the different modes available. This is documented below;

Digital taxi

Uber is by far the leading digital taxi service provider, as identified by 69% who chose Uber as the service provider they use most frequently. Taxify was mentioned by 21% as the service provider of choice, while Little Cab was mentioned by 10%. This is as illustrated below;

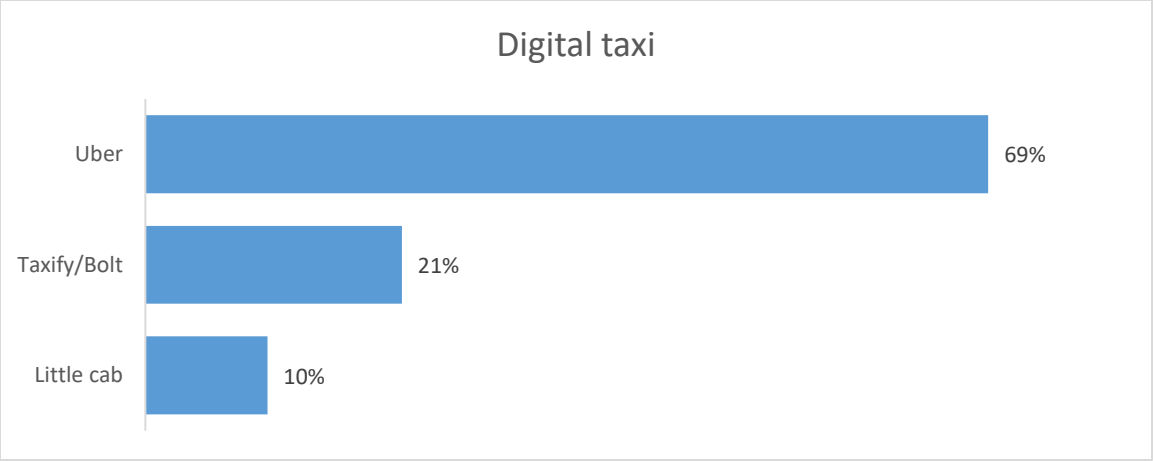

Figure 20: Service providers (Digital taxi)

It should however be noted that there are several other companies operating in the market apart from these three**.**

Shared digital taxi

In Kenya, taxi sharing companies include Twende app and Uberpool for carpooling, but these were not mentioned by the respondents. Instead, the respondents' understanding of digital taxi sharing was requesting for a taxi as a group and splitting the cost. As such, the service providers mentioned in this category were the regular digital taxi service providers. Uber was mentioned by 48% as the service provider frequently used, followed by Taxify/Bolt at 30% and Little Cab at 22%.

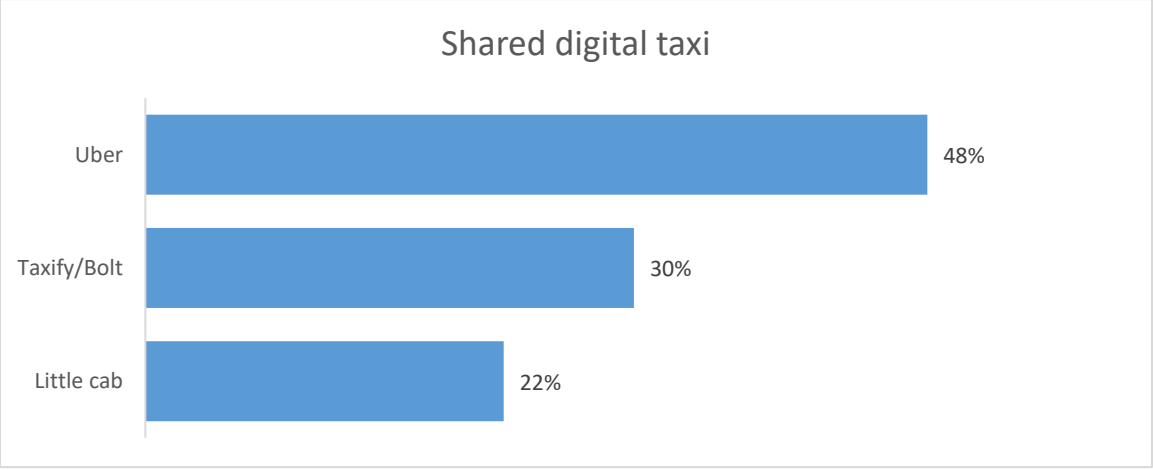

Figure 21: Service providers (Shared taxi)

Digital boda boda

Amongst the digital boda boda users, safe boda was mentioned as the most frequently used by 52%, followed by Taxify/Bolt boda as mentioned by 27%. Uber boda was chosen by 14% as the service provider of choice, while Little Cab was chosen by 7%. This is as illustrated in the chart below;

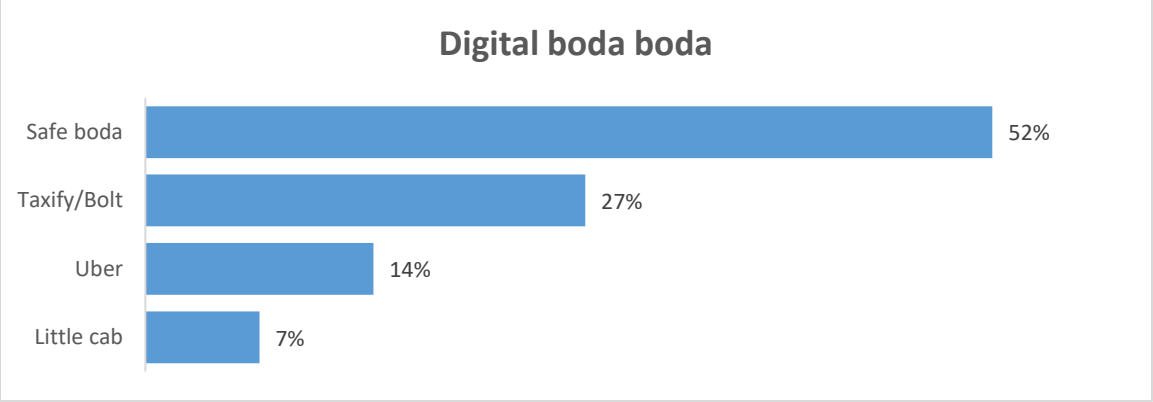

Figure 22: Service providers (digital boda boda)

Digital buses

For users of digital buses/shuttle, Little Shuttle was the most frequently used as indicated by 77% and SWVL was second at 23%. The two are the only digital bus hailing service providers in Kenya at the moment.

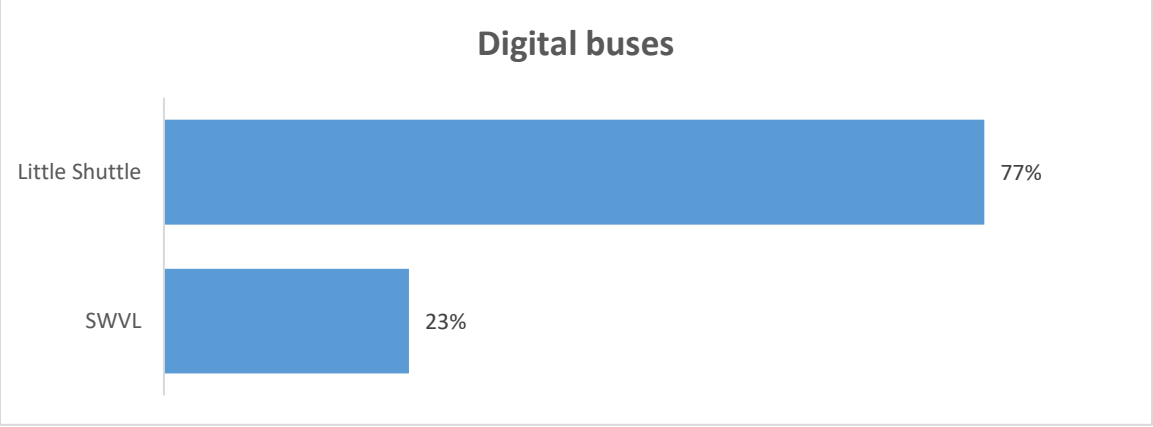

Figure 23: Service providers (digital buses)

3.11. Impact of Ride hailing services on other modes of travel

The entry of ride hailing services has had an impact on other modes of transport, especially direct competitors who are in the same space. To better understand this, users were asked about the change in frequency of usage of other modes, as a result of the ride hailing services.

The biggest impact has been on traditional taxi and traditional boda boda, whereby 35% indicated they use traditional taxi less often than before, while 40% indicated they use traditional boda boda less often than before. However, for matatus, majority (74%) indicated they use matatus about the same as before the introduction of digital taxi, while 18% indicated they use the matatus less often. This shows that the impact of digital taxis on matatus hasn't been very much, as most of the matatu users haven't changed the way they travel.

The impact of digital taxi on other modes of travel is as shown in the table below;

Table 19: Impact of ride hailing on other modes

	I did not use it before, and do not use it now	*I have changed how I use it but not because of ride-hailing*	*Much less often*	*Less often*	*About the same*	*More often*	*Much more often*
A personal car	77%	2%	3%	2%	9%	3%	4%
Personal motorcycle	92%	1%	1%	1%	2%	1%	1%
Tuk tuk	79%	4%	7%	5%	4%	1%	0%
Traditional Boda boda	37%	7%	26%	14%	14%	2%	1%
Matatu	6%	2%	10%	8%	74%	0%	0%
Public bus	41%	2%	15%	14%	22%	4%	2%
Train	93%	2%	2%	1%	2%	0%	0%
Traditional taxi	52%	7%	28%	7%	5%	1%	0%
Walk	9%	1%	11%	11%	67%	0%	0%
Bike	94%	2%	1%	1%	1%	1%	0%

4.0. CONCLUSION

Kenya has one of the highest mobile penetration rates in Africa and at the same time one of the highest internet penetration rate in Africa. In the study, 86% of the respondents owned smartphones, with majority preferring a non-recurring data package plan where they buy data on need basis. Due to the proliferation of mobile technology, it has become very easy for ride hailing applications to penetrate the Kenyan market, aided by the high rates of connectivity. Uber was the first digital taxi app to be launched in Kenya 5 years ago, which opened the doors for other applications. Since then, the market has grown, leading to the expansion of ride hailing apps and even the introduction of digital apps for boda bodas and buses. The study aimed at understanding how these new transportation technologies are changing the way people travel in Nairobi. Overall, 58% of the respondents indicated to having used ride hailing services before.

Expectedly, most of these were digital taxi users, accounting for 80% of the ride hailing service users. A further 17% indicated having used digital boda boda services.

Travel time and cost appeared top of the list of factors that influence the choice of travel for commuters within the city. As such, public transport means remain the main choice of travel for city residents. Public transport means were identified by 69% as the primary mode of travel, that is 59% for matatus and 10% for bus users. This is mainly influenced by travel cost. Walking was identified by 85% as the most frequently used secondary mode of travel on a typical day.

Ride hailing services were used mainly on weekends (Friday-Sunday), with 53% of the respondents indicating so. This coincides with the question on purpose of the trip, where 58% of the users said the trip purpose was social/recreational, which is likely to take place over weekends. However, digital bus users indicated usage across the entire week, as they are likely to be used for both work and social trips.

The most frequently used mode of payment was cash, as identified by 63% of the ride hailing service users. This was followed by mobile money e.g. Mpesa, mentioned by 33%. Credit/debit card usage was very low at less than 1%. However, for digital bus users e.g. SWVL and Little Shuttle, the most frequently used mode of payment was E-wallet followed by cash.

Across all the ride hailing modes, the most likely alternative in case of unavailability of the digital mode is matatus. This is because of their availability in most cases on a 24-hour basis, thus an easy alternative. The key players in the digital taxi category were Uber, followed by Taxify/Bolt and lastly Little Cabs. In the digital boda boda category, the key player was identified as Safe Boda, followed by Taxify/Bolt, then Uber and lastly Little Cab. In the digital bus category, there are two players in the market currently, with Little Shuttle being the most popular followed by SWVL.

Overall, there has been an impact on conventional modes of travel since the introduction of ride hailing services. This has been experienced in traditional taxis and traditional boda boda, where 35% of users indicated to using traditional taxis less often, while 40% indicated to using traditional boda boda less often as a result of usage of ride hailing services. Most of matatu users (74%) indicated no change in their usage of matatus, while 18% said they used matatus less often

as a result of using ride hailing services. The reason why there has not been a big change in the usage of matatus is that currently, the ride hailing modes that are dominant are taxis followed by boda bodas. These are not direct competitors to matatus, in the space matatus occupy in the transport industry. However, the digital matatus/buses would definitely have an impact on the matatu industry, since they will be competing in the same space. However as at now, digital matatus/buses are still at infancy stage in the industry.