A Model for Fine Collection on Traffic Offenses in Kenya

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Abstract: *Transport sector has major influence on any country's economy. According to the Kenya Vision 2030, infrastructure is among the main foundations for the country's sustainable development. In particular, road transport is increasingly becoming dynamic with new modes of road transport emerging such as motor bikes and tuk-tuk. Correspondingly as demand keeps increasing, regulatory authorities are adjusting policies to accommodate new modes of transport. Further, development of transport network systems has brought many economic benefits and challenges which cannot be overlooked. Currently, road accidents are ranked 9th as cause of death and disability in developing nations. The county governments and Regulation authority in Kenya (e.g. NTSA) have implemented several technologies to curb the vice such as speedometer and breathers. Despite such measures violations still go unaddressed indicating challenges in the role played by the regulators. This gap could be filled by having surveillance systems in place with capability to track and transfer real-time information through use of effective control systems that ensure full accountability by traffic department who then book the offender for a court hearing. In the view of this, the researchers sought to address this gap through development of a model for traffic information systems. Information systems are potentially a major source of real-time information; automation of manual systems; transformation of business processes and integration of business processes and boundaries that have previously existed. The main purpose of this study was to propose a model on traffic information system for efficient fine collection in Kenya. The study adopted institutional theory and technology acceptance model. Descriptive research design was applied. A purposive sampling technique was adopted to identify the respondents who were to participate in the study's survey. Online survey technique was adopted by the study using structured questionnaire. The study established a positive impact of the model on fine collection and recommends commercialization as well as deeper investigation in a wider scope for feasibility purposes.*

Keywords: Information systems, fine, traffic offence, road transport infrastructure, real-time systems, information processing, fine collection model

1. Introduction

Fineis a financial penalty for violations, offenses or wrongdoings. Penalties are anticipated to prevent crime, discipline offenders, and reimburse for damages (Carson, Ann. 2015)

A survey carried out in North Carolina revealed that states depended on traffic permits and penalties for both safety and as a tool for revenue collection. This was in response to a 10% budget shortfall, which was met by an increase in issuance of tickets by 6%. In a prominent instance of this exercise, a section of Justice Research of the Ferguson Police unit in Missouri indicated how Ferguson township fixed collection goals for penalties and payments above three million USD in the year 2015, which was 0.2 more than township's operational budget. (Bureau of Justice Statistics, 2014).

In Washington State, criminal justice debtors are subjected to a preliminary uniform charge of 500 USD plus an attracted fee of 12%. Some nations measure payments ranging between $25 and $300 for delayed payments, nonpayment of penalties or failure to put up a scheme for paying debts. Florida's reserved bodies for collecting fines may increase operating charges by 40% (Heather &Beckett, 2010).

In Kenya, fines/ penalties are collected from traffic offenders as a form of punishment. This is in line with article 49(1) (h) of the Kenyan constitution. The same constitution gives an offender the rights not to be jailed for a felony carrying a punishment for fine only or by jail for not more than six months.Fine from these payments is then distributed to support both the national and county governments programs and services. Currently, a number of these funds have faced operational shortfalls due to a decline in fine and fee collections. In this study, the researcher seeks to investigate the system efficiency focusing on the various factors and habits of traffic officers and the public that lead to this decline and then propose electronic payment model for improving fine collections.

As the Kenyan government focuses on attaining its Vision 2030, it has identified transportation as one of the main pillars in attaining its developmental objectives, thus the state has devoted in bettering both the road infrastructure and safeguarding them. The NTSA was constituted in 2012 as the authority in charge of road transport and safety in Kenya (NTSA, 2013). In 2010, there were approximately 3,055 road traffic deaths. This is according to the Kenya Traffic Police unit. A report by NTSA in the year 2013 reported that 13,028 people were involved in road crashes. The social and economic expenses to the state are huge: NTSA approximates that death rates costs Kenya's budget about Kshs.14 billion annually, or 5% of the state's Gross Domestic Product (NTSA, 2013).

According to Odero, Mitullah and Khayesi (2013), Kenya has on average 7 deaths out of 35 daily crashes. This bears

among the highest road deaths worldwide in-terms of vehicle ownership. "Almost 3,000 people die annually on Kenyan roads. This interprets to about 68 mortalities for every 1,000 vehicles registered which are 35-45 times more than states with many motor vehicles. Traffic accidents become the third prominent source of mortalities after malaria, HIV/AIDS and presents a key community health problem informs of disability and related health care costs (WHO, 2013).

Odero et al. (2013) made an observation on how stakeholders of transport industry fault the Kenyan bad condition of roads as the major cause of accidents. Regardless of the latest improvements of the Kenyan roads infrastructure however, deadly road fates are still testified. This has led to a fault game with the Public Service Vehicles (PSVs) operators and Kenya Police traffic department, having the former blame the poor country of Kenyan roads about accidents and the latter blaming PSV operators, for breaking the clearly stated traffic laws. PSV drivers blamed for careless driving, unskillfulness, over-speeding; driving under influence and a countless of other wrongs that expose them to accidents that could have been prevented.

While the Kenyan Traffic department on the other hand has been accused of administering the Traffic Act, they have at many times been trapped on camera accepting bribes, and have appeared in several corruption index reports resulting in wrongs. As a matter of fact, results from East African Bribery Index (2017) report clearly indicate that the Kenyan Police tops the list of corrupt institutions in Kenya. Kenya Roads Board (KRB, 2013) asserts that only 11,197 km (7%) out of 160,886 km of public roads are tarmacked. However, most accidents reported happen along three highways: the Nairobi to Thika super highway, the Nairobi to Mombasa Road, and the Nairobi to Eldoret Road recording the highest number. Thika-super highway which is about 50.4 km and Mombasa Road which is about 470 km happens to be part of the active Kenya roads; thus a rigorous expansion plan in line with Vision 2030. There are almost 80 documented black spots, majority of them existing along these three highways.

In a recent daily nation newspaper dated 22nd Jan 2018, Kericho County Commander James Mugera informed the *Nation* that most accidents are caused by indisciplined drivers who overtake carelessly, use wrong lanes and dangerously join roads at junctions."Speed is not one of the main causes of accidents in Kericho. It's purely driver carelessness. Drivers break traffic rules knowingly," said the officer. In general, 52 people were killed and 17 others injured in accidents reported in different parts of western region in the past three months. The western region traffic police boss Geoffrey Njogu said: "Speeding by motorists and motorcycle riders and their failure to observe traffic regulations contributed to the high number of accidents in the region."

In investigating the circulation of accidents by several factors, years 2004 and 2007 were considered based on the fact that the year 2003 brought about the introduction and implementation of more strict traffic rules by the then Minister for Transport, the late Hon. John Michuki, majorly focusing on the PSVs. The capacity of passengers for matatus was reduced tothirteen; speed limit put at 80kph and speed governors brought in place, compulsory safety belts for all passengers as well as the selection of drivers and conductors who had to meet severer rules (Kenya Police, 2012).

Most of the developing countries are faced with challenges in terms of revenue collection, which results in a gap between what they actually collect and what they are expected to. Amongst these challenges, Muita (2011) unfolds one of them being the acceptance of developing technologies and digital payment systems which are more efficient to reduce waste.

In a recent study on digital Payments adoption by the Kenyan Commercial Banks, Nakhumwa (2013) suggests that Kenya is currently under a technological progress which is forming business landscape considerably. Hence need for the researcher to find out whether fine collection in the traffic department is up to speed in their revenue collection digitally.

1.1 Objectives of the study

One is to investigate the factors leading to inefficiency in fine collections from traffic offenses and two is to develop an ideal model for fine collections

1.2 Research Question

1) What are the factors leading to inefficiency in fine collections from traffic offenders?
2) What are the elements of an ideal fine collection model

1.3 Rationale and justification

Both the Kenyan citizens and the government continues to suffer losses through inefficient fine collection measures most of which are caused by the traffic officers that constitute part of the government agencies and partially by the public herein referred to as the Kenyan citizens.

Fine payment evasions cases have been common due to poor means of tracing them, but with the installation of cameras along major highways, photos and vehicle registration numbers will be captured and stored in a server. In addition, these cameras are capable of recording crime scenes on their happenings (Capital news, 2013). All this is for conviction of the traffic offenders who may require evidence before paying their penalties in terms of fines.

One of the causes of traffic accidents especially in developing countries is poor traffic rules implementation. This is brought about by insufficient funds to implement the rules, administrative challenges and corruption, which is a major issue in most countries. Corruption has created blame game between the public, the drivers and the police, with each blaming the other for the failures (Nantulya& Reich, 2006). Thus an e-fine collection system model comes in handy as an enforcement tool to foster the traffic act.

2. Related Studies

A Forbes Magazine article reports that buyers are changing gradually from using credit cards and cash to using the easiest and most convenient form of payment for them. Furthermore, mobile payments are meant to be the main element of the growing "digital wallet," and financiers need an assurance of this up and coming market (Carson, 2015).

Ernst & Young states that mobile payments should be full grown business, with a widespread market of up to $245 billion by the year 2014.There is rapid transition, as payment modes are progressively fading away from credit, debit and cash to smartphones, tablets and other mobile devices (Ernest & Young, 2011).

Historically, courts often fall behind the times when it comes to implementing payment solutions in comparison to the private sector. Amazon revolutionized the industry with online shopping. Starting in 1995 by selling books online, Amazon is among the largest digital retailers globally, selling everything from tubas and golf carts to dishwashers and diapers. Yet, there are many courts that have only recently started accepting credit cards at their payment windows, much less offering online solutions to pay fines or fees. (Siwicki, 2013)

Siwicki, Managing Editor of Mobile Commerce states that 65% of mobile and finance experts say that mobile devices represent the "future of money" by the year 2020 (Siwicki, 2013). Assuming that Siwicki's statement holds true, if the historical approach taken by courts to technology is repeated, the courts will plan for the first roll-out of some sort of mobile payment solution by the year 2030. Courts need to be more proactive than that. Mobile payment is an extension of digitization, but with an additional section of security and convenience for end users (Siwicki, 2013).

Steve Schultz (2012) defines Digital Wallet as having no difference with leather wallet. He looks at it as a case that stores valuable stuff. Similarly, it keeps stuff similar to money payment cards and cash. Other items to be included are: identification of health care information, loyalty cards, photos, receipts, shopping lists, and checkbooks (Schultz, 2012). He gives the example of how he used to store photos in his wallet. Now, he has dozens of photos on his smartphone that he can thumb through instead (Schultz, 2012).
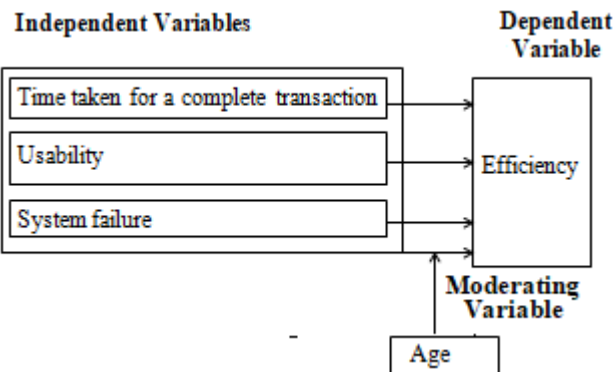
2.1 Conceptual framework

Figure 1: Conceptual framework (Researcher, 2018)

3. Research Methodology

3.1 Research Design

Descriptive research design was used for qualitative data collection to determine how electronic fine payment system as a service can bring about efficiency in the Kenyan traffic department on their revenue collections. An extensive research was conducted and primary data collected from drivers, conductors, passengers, pedestrians, traffic police officers, NTSA officers and the judiciary to help develop this model as a solution. Descriptive research design is used in standard and investigative reports to enable researcher collect data and information, to summarize and interpret findings for the purposes of clarification (Cooper, 2012).

3.2 Population of the study

The target population of this study was traffic police officers, NTSA officers, the Judiciary, motorists, conductors, passengers and pedestrians within Nairobi County. An ideal sample is one with capable to meet the requirements of efficiency, representativeness, reliability and flexibility (Kothari, 2004). Therefore the researcher approximates a population of 120 respondents.

3.3 Sample Size

Mugenda and Mugenda (2013) advocates that a good sample population lies between 10% and 30% of the entire population. Taking an approximate sample population of 385 respondents, the sample size will be 30/100*385=116 respondents. Thus this study collected data from 116 respondents (Mugenda and Mugenda, 2013). If a researcher while collecting data using interviews and after the tenth one realizes that there are no new concepts coming up that is data begins to be redundant, it means the sample size is just good enough before the redundancy begins (Marshall, 2012). Based on this, eighty respondents were used. The Kenyan government has the ability to enhance efficiency in terms of revenue collection from her agencies if technology is given priority. Reduction of corruption, reduction in man hours spent in court process, reduction of congestion in courts.

4. Data Collection

This part of the study focuses on a descriptive and quantitative analysis of the components of an ideal electronic fine collection model for revenue collection in government agencies. The data was collected exclusively by use of questionnaires as the primary research instrument which was designed in relation to the research objective.

4.1 Data analysis and presentation

In an analysis done by Cooper and Schindler (2000), data analysis was defined as the process of reducing accumulated data into manageable data, summarized as well as coming up with patterns through the use of statistical tools. Mugenda and Mugenda, 2013 explains data analysis as coding, categorizing, data entry, manipulation and summarization of data. The well completed questionnaires were counter checked, cleaned and edited to ensure correctness and completeness. The data was then coded and analyzed using Statistical Packages for Social Sciences. Lastly, data summaries were presented in form of percentages, figures and pie charts. A descriptive analytical statistics was therefore adopted.

4.2 Response Rate

The study targeted 86 respondents from the public who may or may not have committed any traffic offense and 20 respondents from the government agencies partied to this research who may or may not have dealt with traffic offenders. This target group of respondents included drivers, conductors, passengers, pedestrians, traffic police, the Judiciary and the NTSA. 116 responses were expected but only 83 valid responses received amounting to 72 percent response rate. This response rate is valid since based on Mugenda and Mugenda's findings, 50 percent is adequate for analysis and reporting; a response rate of 60 percent is good and a response rate of 70 percent and above is considered excellent.

4.3 How long traffic offense cases take to be solved
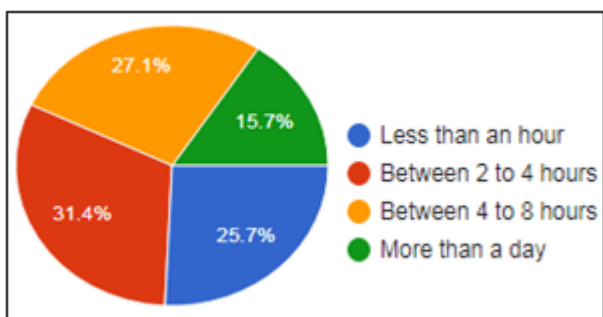

Figure 2: Period it takes for a traffic offense case

The researcher found out that a lot of time (between 4 to 8 hours) is taken after an offender is arrested, arraigned in

As to whether the current cash to bank payment system experiences failure, more than 60% disagreed that the available payment facilities failed in most cases due to huge congestion in courts and thus a lot of demand for the

court until he/she is released. This converts to congestion in courts and more manpower needed for the process. 31.4% respondents were the majority and this is because in most cases most of the offenders are not taken to court translating to fines not being paid as expected.

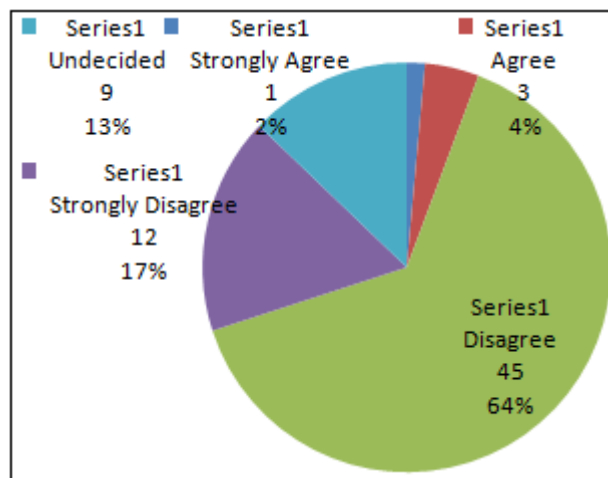## 4.4 Ease of use of current system and its security

Figure 3: Ease of use and security of current system

On the system security and use, 64% of the respondents disagreed because the system is in public thus prone to attacks. On the other hand, 4% of the respondents agreed to the fact that the system was secure simply because they always see security guards around which is not an ideal reason to justify the security level of any system

4.5 Current cash to bank payment system experiences NO failures and delays
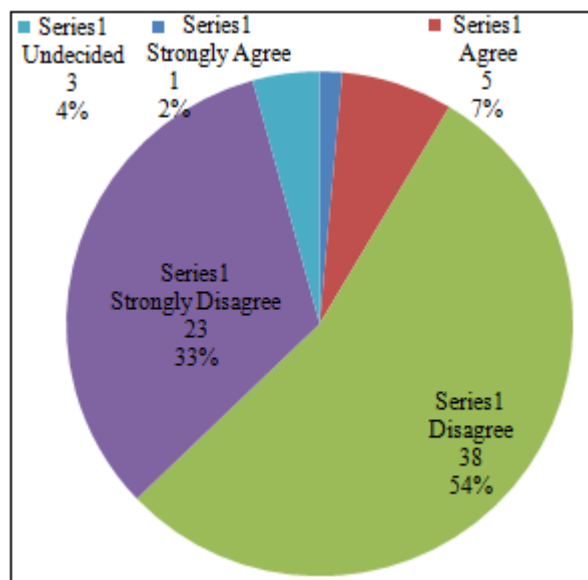

Figure 4: Rare experiences of current system failure

facilities. They also noted that the available facilities timed out quite often increasing the queues waiting for the services.

On the contrary, the remaining percentage cited that the existing system had neither failures nor delays and this is because most of them had no experience with the system. Fine are always paid on their behalf i.e. by a third party.

In summary, the researcher found out that the current system of paying fines through cash to bank is very slow, time wasting, not economical at all. Offenders are forced to engage a third party for them to complete the payment process. This is very involving.

Penalties are usually payable upon admission of quilt. The current system involves arrest of an offender, arraignment in court, plea taking, and probably a hearing before a matter is concluded. In many cases the offenders are ready to admit their quilt and pay fines so that they can move on with life. In such cases, the normal process is considered very time wasting. It also takes up a lot of time of law enforcement officers and the courts.
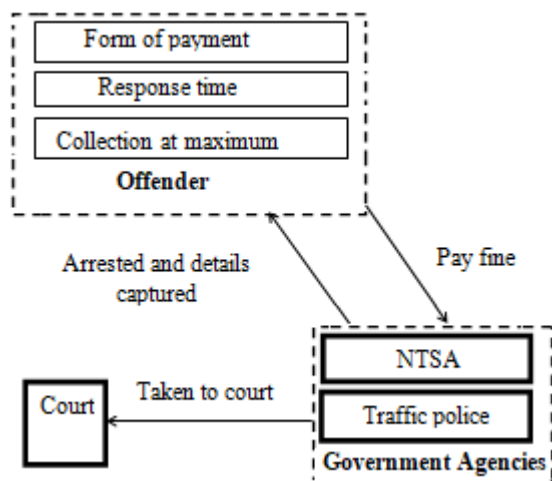

Figure 5: Fine collection model

To determine the level of fines, such fines must be those prescribed by law, hence the need to develop a system model that would lead to that.

A major challenge to such a system is integrity of officers dealing with this system. Integrity becomes a big challenge where the law imposes fairly huge fines like Kshs. 5,000 and above. The public may be tempted to give a bribe and the officers may be equally tempted to receive a bribe, which bribe will be less than the legal fine. However this is a common challenge as seen by the researcher from the findings and that this will take a consented effort of education awareness to fight off. It can also be confronted through monitoring of the officers concerned.

All in all, it is a system that will:
a) Reduce tremendously the number of people appearing in court
b) Free the courts' time to attend to other matters
c) Free time of law enforcement spent on arraigning people in court

5. Summary, Conclusion and Recommendations

5.1 Summary

This study investigated the factors leading to inefficiency in fine collections from traffic offenses done by the traffic police officers and the minor traffic offenders in Nairobi county Kenya. The findings showed that the system encountered a lot of failures and was prone to errors; the system was not that easy to use as it was slow thus inconvenient because of the attitude of individuals in charge of it. The results further showed that a lot of time is wasted from the time an offender is arrested until the fine is paid especially if due process is followed.

5.2 Conclusion

The current fine payment system (cash to bank) is becoming a tedious process to all stakeholders after one is caught committing a traffic offense. It is becoming very important to develop an electronic fine collection model that is going to foster efficiency in the fine collection processes. The findings showed that the current system used is very slow in terms of speed. The study revealed that the introduction of electronic fine payment system would greatly improve the citizens' lifestyle in terms of time and useability and on the governments' side; this would increase revenue collections. That means an offender committing an offense knows the penalty and that can pay for it very easily. This will minimize time wastage as the offender will be able to pay for the fines easily through the system. Thus a worth taking model for both the national and county government.

5.3 Further research work

The model is recommended for use by government agencies and it acts as a guideline to ensuring corruption is minimized while implementing this e-fine collection model.

The model was developed based only on the mentioned parties but there is need to check whether it can be applied to other government agencies and other organizations. A different approach will need to be used focusing on the role of each agency and its specific departments and other relevant factors.

The researcher therefore recommends that: One, a lot need to be done in relation to weaknesses affecting electronic real time fine collection model and their justifying factors.

Two, more research to be done on integrating other electronically adopted real time payment systems to bring about the best system especially in Kenya as a developing country. Studies to be done on security models in relation to fine payment systems and if the model can include the cloud solution.

6. Acknowledgment

Nina, son Israel and Prof Dr. Dr. MoniWekesa, you cannot go unnoticed.

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Appendix i: Questionnaire

Mount Kenya University
Master of Science In Information Technology Thesis
Questionnaire No………………

I am a Mount Kenya University student pursuing a Master of Science in Information Technology. Currently am conducting a research on "*A MODEL FOR FINE COLLECTION ON TRAFFIC OFFENSES IN KENYA*". This questionnaire is intended to capture information concerning this research work. You are kindly requested to honestly respond to the questions within knowledge. You are also guaranteed of full confidentiality, privacy and anonymity for any information provided. The questionnaire contains four sections A, B, C & D. Thanks for your co-operation

Please put a tick mark [ ] in the required box wherever required

Section A: Socio-Demographic
Q.1 Gender   (1) Male ☐   (2) Female ☐

Q.2 Age   (1) 18-25 ☐   (2) 26-35 ☐   (3) 36-45 ☐   (4) Above 45 years ☐

Q.3 Level of education   (1) Certificate ☐ (2) Diploma ☐ (3) Undergraduate ☐   (4) Post-Graduate ☐

Q.4 Where do you work?   (1) Judiciary ☐   (2) NTSA ☐ (3) Traffic department ☐   (4) None of the above ☐

Section B: Ease of Use, System Failure and Response Time Towards Digital Payment Systems
Kindly indicate the extent to which you agree or disagree with the following statements regarding the use of digital Payment System.

NOTE: SA: Strongly Agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly Disagree

Ease of use [cash to bank]	SD	D	U	A	SA
The current payment application is user friendly					
The payment system responds fast to payment requests					
In my opinion the payment system is easy to use					
The application are easy to access through mobile devices					
System failure					
I have experienced minimal system failures during transaction process					
I trust the current payment system to settle my fine payments					
In my opinion the payment system rarely has outages (e.g time outs, hanging, network failure)					
I would defiantly use the current e-payment systems for my future fine payments (repeat usage)					
Response time					
The system is compatible with my mobile devices					
The application is cost saving when in use					
The current payment systems are easy to navigate through while in use					
Output quality					
The application has strong network connectivity when transacting					
In my opinion, use of digital payment systems improves my lifestyle					

Appendix ii: Interview

Interview Schedule for the Police and the NTSA Officers
I am a University student currently conducting an academic research on "A Model for Improving Fine Collection on Minor Traffic Offenses In Nairobi, Kenya". This questionnaire is intended to capture data concerning this research work. You are therefore invited to honestly respond to the questions below. You are also guaranteed of full confidentiality, privacy and anonymity for any information provided.

Instructions: *In this section please select one option that best describes you as required*

1) What is your gender?
    Male ☐   Female ☐
2) How long have you been in service?
    Less than two years☐ 2 to 5 years ☐   5 to 10 years ☐   Above 10 years ☐
3) Have you ever arrested any minor traffic offender?
    Yes ☐   No ☐
4) Do most of the offenders cooperate during this exercise or they tend to resist?
5) Mention just but a few among the most common minor traffic offenses?
6) How do these offenders pay for these offenses?
7) How did you arrest the offender?
    Took Driving License ☐ Removal of number plate ☐
    Tow of vehicle ☐ Drove to the police station ☐
8) How did you solve it?
    Taking them to court ☐ Agreement with the officer ☐
    Let go after apologies ☐ Other ☐
9) Approximately how long does it take you to handle such offenses?
    Less than an hour ☐ Between 2 to 4 hours ☐ Between 4 to 8 hours ☐   More than a day ☐
10) Do you find the normal court process for paying these fines for minor traffic offenses to be time saving?
11) Is the Kenyan fine payment system for minor traffic offenses convenient?
12) In your own opinion is it easy to use the current payment system (court process)?
13) Are the payment facilities for these fines accessible once one is arraigned in court?
14) Do you think with the introduction of an electronic fine payment system will help save on cost, time, convenience and other resources?
15) Do you think with the introduction of a real time fine payment electronic system will improve our lifestyle as Kenyans?
16) Will this model help to ease your work execution?

Thank you for your time and cooperation.
The first author works for Kiriri Women's University of Science and Technology