Effect of Traffic Jam on African cities: A Case of Kampala, Kigali and Lilongwe from 2014 – 2018

[1]*Henry Stanley Mbowa, [2]William Mudahemuka, [3]James Isaac Magaleta, [4]Nzaghale Charles
[5]Prof. Lazarus Ndiku Makewa

[*1]Kampala University, Uganda
[2]University of Tourism, Technology and Business Studies, Rwanda
[3]Malawi Adventist University, Malawi
[4,5]Rwenzori International University, Uganda
*Correspondent Author: mbowa200@gmail.com

Abstract: *Traffic jam remains problematic in most cities across the globe with consequential phenomena like massive delays, monetary losses, fuel wastage, and accidents and death. The paper was to examined causes and effect of traffic jam in Kampala, Kigali and Lilongwe cities in Africa. The paper employed documentary, case study and correlation designs using both qualitative and quantitative data collection approaches. The study targeted a total of 60 online published articles from which a sample of 36 articles. Data was collected through documentary review online published articles on traffic jam and recorded using a data collection sheet. The data collected was organized, coded and entered into the SPSS software for cleaning to generate the descriptive and inferential statistics, while qualitative data was transcribed, grouped into themes and analyzed using the content value analysis. The findings indicate that major causes of traffic jam in the studied cities are increase of private vehicles, unregulated road junctions, temporary road function, informal street and roadside trades, and poor bumpy roads with potholes.*

Keywords: *Traffic jam, Monetary, Delays, Kigali, Kampala, Lilongwe*

How to cite this work (APA):

Mbowa, H. S., Mudahemuka, W., Magaleta, I, J., Nzaghale, C. & Makewa, L. N. (2022). Effect of traffic jam on African cities: A case of Kampala, Kigali and Lilongwe from 2014 – 2018. *Journal of Research Innovation and Implications in Education, 6*(2) 389 – 396.

1. Introduction

Traffic congestion, is one of the most relentless setbacks affecting many countries all over the globe (Vencataya, Pudaruth, Dirpal and Narain, 2018). Vencataya *et al.* (2018) further suggest that cities all over the globe have been affected by the rise in numbers of cars plying the city streets. The statement suggests that no region over the globe has been spared ranging from the world advanced cities to the cities in the developing world. As for the Island nation of Mauritius, traffic congestion is no exception as it has only one "60-kilometer motor way that runs from the North to the South of the island, hence connecting the airport at Plaisance, the built-up areas of Beau-Bassin, Rose-Hill, Curepipe, Vacoas/Phoenix, Quatre-Bornes, Port-Louis, and the countryside area of Pamplemousses" (Vencataya *et. al.,* 2018, p. 231)

Turning to Vietnam, Nguyen, Pham and Phan (2019) indicates that traffic congestion in the city of Hanoi and Ho Chi Minh, has resulted in an imbalance between roadway system functioning that users hope for and exactly how the system actually operates. Thus suggesting that the road system is no longer meeting the city dwellers expectation as roads carrying traffic are congested resulting in poor performance. Hickman, Ashiru, and Banister cited in Agyapong and Ojo (2018) posit a worst scenario in China which was experienced in a city known as Habee. In the city of Habee, it's on record that traffic jam reached its worst as cars queued for a distance of 100 kilometres.

South America is no exception as traffic jam is a serious issue in Brazil. Mahendra cited in Agyapong and Ojo (2018) shows that Sao Paulo a Brazilian city is famous for having undergone worst traffic jams, as people got held for two to three hours on daily basis in traffic jams.

Agyapong and Ojo (2018) cites Ghana in West Africa, as a country facing traffic jam. The traffic jam is said to be a great task most especially along roads operating in Accra Central Market. As Raheem, Olawaoore, Olagunju and Adeokun (2015) submits that, as the population of different countries are increasing, so too are the demand for road users growing. It follows that there is growth in population, nothing tangible has been done to complement the construction of new roads, thus causing roads to be congested. In Nigeria Raheem *et al.* (2015) effected a case study involving traffic congestion along the Basorun-Akobo Road in Ibadan Oyo State where the challenge is rampant. In Southern Africa especially the Republic of South Africa, several of her big and small cities have not been spared in as much as traffic jam is concerned (Das and Keets, 2014).

As for Malawi documentations show that from 2008 up to 2016, there has been a motor vehicles average growth rate of 12 per cent translating to vehicle population of 290,935 from 104,800 (NTMP, 2017). Consequently, due to the speedy increase in the total number of vehicles traffic congestion has been caused along the M1, particularly in the Old Town area as that also acts as an international through road passing across the centre of the urban area. Going by 2017 statistics, it has been shown that average traffic speed for Lilongwe especially during morning peak hour reaches an average of 29.2 kilometres per hour as cited in NTMP (2017. p.67). This suggest that traffic congestion is real in this south eastern African country though not as bad as it is for Dar-es-Salaam in East Africa as of 2016 statistics the average speed fluctuated between 10-12 kilometres per hour (cited in NTMP, 2017. p.68).

1.1 Objectives

Consequently, the study seeks to assess the causes and effects of traffic congestion in Kampala, Kigali and Lilongwe respectively. The following research objectives will guide this study:

1. To identify the factors influencing traffic jam in the affected cities
2. To assess the traffic jam control initiatives existing in the cities
3. To analyse the indicators of traffic jam in the cities

Wang, Gao, Xu, Sun cited in Das and Keets (2014) assert that traffic jam create a variety of adverse end result, which consist of undesirable economic impacts and environmental contamination. Das and Keets (2014) observe that there are protracted bottlenecks of vehicles, which move in relentless start and stop basis as the number of automobiles making use of the road go beyond the design intended to ply the road. It follows that the road designs in the various cities in the world can no longer afford to support the high volumes of cars using the available road system. Consequently, this has led in heavy traffic resulting in pathetic state of traffic jam.

2. Literature Review

2.1 Factors influencing traffic jam in the cities

According to National Statics Institute (2015), the population of Kigali City stands at approximately 1.2 million. The continuing growth reflects on ongoing migration from rural areas to the Kigali urban region, which accounted for 60% of the city's growth in the 1960s and 1970s. Rodnique *et al.* (2009), note that jam in urban areas is dominantly caused by commuting patterns and little by truck movement. In fact, there is no doubt that when the number of population is increasing leads to the high volume of traffic jam. For, it is very possible that the traffic jam in Kigali comes as result of the overpopulation in Kigali.

Malaya *et al.* (2015), with the low road space it is common that very few vehicles will get the chance to pass through them. And therefore, it ends up causing the traffic jam. In Kigali, most of the present roads are very narrow and low space. Nowadays African cities are expanding. As the city needs roads, government ke eps creating new roads. But there is no pre plan. That is why traffic jam is an outcome of unplanned city. Roads tend to be narrow and poorly built. As cities grow in an ad-hoc manner, no provision is made towards scaling road capacities, eventually resulting into several bottleneck roads, which remain congested for extended periods of time. Furthermore, many developing countries have witnessed an explosive growth in their vehicular population resulting in a failure of conventional traffic management strategies (Jain *et al.*, 2016).

According to Mahmud *et al* (2012), Private car in the roads are also causing traffic jam. As in one private car there are only 2/3 people but, the car is taking a lot of space. There are also fewreasons that we found out through our survey. Footpath occupying by hawkers make other people walk by the road, which is blocking the space for vehicles and causing traffic jams. In Kigali this also happens almost too all paved roads, pedestrian crossing facilities are not well design ed in a way that could result into a soft movement (Warwick-Booth, 2010).

Muhmud *et al.* (2012) note that developing countries need mass traffic system to distribute the traffic proportionately. Absence of this will definitely put a lot of pressure in traffic channel and cause traffic jam. In Kigali, Kampala and Malawi apart from having insufficient roads infrastructure, there is also poor mass traffic system that would help drivers in the period when vehicles are too many in the roads. Malaya *et al.* (2015) in their work *"Reasons behind the heavy traffic jam in Dhaka City from Bangladesh"* they explain that the basic problem of the city's traffic system is that the existing road network is incapable of holding the ever increasing number of motor vehicles. Consequently it creates a challenge of traffic jam in the morning hours likewise in peak hours. One important complain against traffic is lack of law

implementation is encouraging illegal parking. Buses often overtake other vehicles from the wrong side (Downie, 2008). Many buses traveling on different routes of Kampala city do not comply with requirements under route code. According to Malaya *et al.* (2015), most traffic intersections having installed traffic signaling system, the on-duty traffic policemen resort to the manual control of vehicular movement, on the plea that the system is ineffective during rush hours. This could be mainly due to the absence of a synchronized operation of the entire electronic traffic signaling system.

Malaya *et al.* (2015), the main cause of traffic jam is traffic rule violation. Similarly too many vehicles in road and reckless driving of few drivers are causing traffic jams. Many drivers violate traffic rules due to the gap of knowledge and unwillingness to follow traffic rules. Lack of proper training to the drivers and lack of driving license are also causing traffic jam. There are also few reasons that we found out through our survey. Some people think these reasons can also cause traffic jam. Drivers in Kigali also haven't got any refresher course of driving training even once per year. This results into inefficient driving and traffic jam, (Buchanan & Crow, 1974). Due to lack of parking policy there is no planned parking facility over the cities. That is why private vehicle operators stop their vehicle s in any place, where they need. The public buses ignore the authorized bus stoppages and picking up and dropping passengers from any point, even from the middle of the road Malaya *et al.* (2015). In the cities there is a mixture of vehicles, big trucks, motorcyclists, private cars, public transport buses (Big buses and omnibuses), bicyclists and pedestrians, and they all move on different speeds which result into traffic jam from a competitive mind-set of going first (Jain *et al.,* 2012).

(South & Warwick-Booth 2010) in transport sectors and reduction of road and lanes due to road construction and maintenance are other identified factors which are leading the shortage of infrastructure supply and in return the demand exceeds the capacity thus leading to jam. Improper traffic controls and management also result into traffic jam. Major factor to traffic jam is whereby all transport modes use the same road. The development of road networks scheme to give separate access to heavy truck, bicycle and pedestrian in the urban centers and its quality and quantity influences the level and traffic flows. Efficient and free flow of vehicles is possible if the roads are well planned and constructed (Balcombe *et al*, 2004).

2.2 Indicators of traffic jam in cities

Transportation planning is undergoing a paradigm shift which is changing the way we define transport problems and evaluate solutions. The old paradigm evaluated transport system performance based primarily on motor vehicle traffic speeds, using indicators such as roadway level-of-service, the travel time index and their variants such as the INRIX, The transportation data firm INRIX Research released on Tuesday its annual rankings of the most congested cities in the USA. Jam Scorecard and the Tom Tom Traffic Index, which measure jam intensity, that is, the amount that motor vehicle traffic speeds decline during peak periods. Such indicators are useful for individuals making short-term travel decisions, such as how to travel across town during rush hour, but they are unsuited for strategic planning purposes since they fail to reflect jam exposure (the amount that people must drive during peak periods), and so ignore the potential jam reduction benefits from shifting modes or more accessible development patterns which reduce travel distances. For planning purposes it is important to use indicators which measure jam costs, such as per capital annual jam delay. Bang, K.-L. (2006).

The table below summarizes various traffic jam indicators. Some only measure jam intensity, while others are more comprehensive (they consider total traffic delay, taking into account travelers' exposure to jam as well jam intensity) and multi-modal (they consider delays to all travelers, not just motorists), and so measure total jam costs. It is important that everybody involved in transportation planning understand these distinctions. Bang, K.-L. (2006).

Table 1: Common jam Indicators

Indicator	Description	Comprehensive	Multi-Modal
Roadway Level-Of-Service (LOS)	Intensity of jam on a road or intersection, rated from A (uncongested) to F (most congested)	No	No
Multi-modal Level-Of-Service (LOS)	Service quality of walking, cycling, public transport and automobile, rated from A to F	No	Yes
Travel Time Index	The ratio of peak to off-peak travel speeds	No	No
Avg. Traffic Speed	Average peak-period vehicle traffic speeds	No	No
Avg. Commute Time	The average time spent per commute trip	Yes	Yes
Congested Duration	Duration of "rush hour"	No	No
Delay Hours	Hours of extra travel time due to jam	Yes	No if for vehicles, yes if for people
Congestion Costs	Monetized value of delay plus additional vehicle operating costs	Yes	No if for vehicles, yes if for people

2.3 Traffic jam control initiatives existing in cities

Ali *et al.* (2012) said that the government should ban further hotels, trade centers, shopping plazas, housing schemes and wedding halls along main highways and roads in the city. The construction of flyovers, under passes and roads expansion should be based on comprehensive surveys in the planning process for transport sector in the city.

To reduce the fastest ever traffic growth, the use of private cars should be discouraged through the introduction of decent public transport, including circular rail and transit transport in the city. Shamsher (2013) suggested that Government should charge a high amount of tax on imported cars and other private transports. In three phases in the next 20 years additional 259 km of 2-way 2- lane Urban Streets will be constructed/upgraded to develop new bus routes (Development of an appropriate strategy for reduction of traffic jam and air pollution in Kigali City). Public transportation has quite different effects on reducing urban traffic jams when compared with other kinds of instruments.

According to Richards (1990), Cycling is now considered by policy makers in many cities as a suitable way of city's transport. Therefore policy makers can do improve the security and environment of cycling both in parking and street to encourage people to choose cycling. Cycling should not be mixed with other transport means. As the city is running with inadequate amount of unprofessional traffic police than required, it is the need of our authority to increase the number of professional traffic police by training them regularly. In Kampala there are buses stoppages only where busses and other public transportation can stop and pick or drop passengers, but these bus stoppages exist only in written form or legally. Rarely any public transportation will be found that stop correctly stop at the dedicated Bus stop (Shamsher 2013). Roads of the city are narrow indifferent places.

However some research indicates that road widening provides only slight reductions in urban Traffic jams. However, it is also essential to upgrade existing road infrastructures to make compatible with the recommended road sections.

In a very high density developing city such as Kigali, Lilongwe and Kampala there is simply not enough space to accommodate unrestricted growth in the use of private motor vehicles regardless of adopting transit oriented infrastructure development programs. According to Remi, at el. (2009), said that Jams can be reduced by either increasing road capacity (supply) or by reducing traffic (demand). Bus route franchising (BRF) is a concept applied in Dhaka. This process is going to reduce the hassle of the passengers. This kind of services should been forced in Kigali, Kampala and Lilongwe cities as well, where you find buses of the same company, one using digital ticketing whereas another still uses analogue printed tickets. (Shamsher2013). When cities are trying to reduce urban traffic jam, the first idea is often building more roads, to allow increasing traffic volumes. The more capacity of roads net, the more traffic flows in each period. Supplying more roads capacity or improving the old roads net seems feasible and necessary in the areas at a rapid growing of population or vehicles, Zhang (2011).

3. Methodology

The paper employed documentary, cross sectional survey and correlation designs using both qualitative and quantitative data collection approaches. It targeted three (3) cities in African countries hit by traffic jam and its effects on the public and environment. In these countries, a total of 60 original articles published electronically from 2014 to date. The reviewed articles by the researchers was recorded in a data collected sheet. The period of 2014 –2018 was chosen as this is the Common Era traffic jam period in cities under investigation. During the review, we searched in both electronic databases and journal collections, including Google scholar, Science Direct, John Wiley, Web

Science and Springer. In this, text words such as (traffic jam; cause of traffic jam; effect of traffic jam; traffic jam strategies accident) and ("Uganda-Kampala"; "Kigali-Rwanda"; "Lilongwe-Malawi") were used. Reference citations in some articles were used for a further search to accomplish the study.

Firstly, all article references (title, abstract and keywords) that were deemed relevant to the topic were read, retrieved and stored in a data collection sheet for further analysis. Further, details of the articles were sub-divided into title, year, design, method, database, results/findings (cause, effect, indicators, strategy) and city/country. Therefore, the full text of each article was downloaded electronically.

The selection for each article depended on a predefined inclusion and exclusion criteria. The inclusion criteria put into consideration of the following: articles focusing on cause, effect, and strategies of traffic jam in Kampala, Kigali and Lilongwe cities, and original articles with a study design published in English, and articles published in 2014 and onwards. The exclusion criteria excluded the following: studies not focusing on either traffic jam incidents or safety, topics not focusing on Uganda, Rwanda and Malawi, articles without or an inadequate study design, articles published before 2014 and articles not published in English. Case reports and case series, conference proceedings, letters and commentaries were excluded. This means that, a sample of 36 articles were referred for review by the researchers and each researcher was tasked to search, download and review and document 12 articles from his country of origin for final analysis.

The study was typically a documentary review done for purely philanthropic purposes. Therefore, did not require any sanctioning or approval from any authority. However, to ensure the validity, at first, reference extractions were independently checked and screened by researchers to identify and prevent any duplication. This is because some articles were reportedly published in more than one journal database. Additionally, researchers reviewed the references to decide whether they met the inclusion criteria. However, some discrepancies regarding the eligibility of some of the articles emerged, especially with the "not-related articles". In this case, independent researchers reviewed the articles to help in resolving the discrepancies in order to ensure the consistency.

Data collected was organized, coded and entered into SPSS Software for cleaning and analysis to generate descriptive and inferential statistics. The data analyzed helped to establish the relationship between variables in the paper. Thus, all these were achieved through the use of Pearson product correlation coefficient and regressions analysis. On the other hand, qualitative data was transcribed, grouped into subthemes to attach meanings to the themes and analyzed using content value analysis

4. Results and Discussion

Table 2 indicates that in the three cities, buses, cars, bodaboda and bicycles are the means of transport

Table 2: Common means of transport in Kampala, Kigali and Lilongwe cities

Mean of Transport	Frequency (n=36)	Percent	Valid Percent	Cumulative Percent
Buses	4	25.0	25.0	25.0
Taxis	10			
Cars	6	25.0	25.0	50.0
Boda-bodas	13	25.0	25.0	75.0
Bicycles	3	25.0	25.0	100.0
Total	**36**	**100.0**	**100.0**	

Factors influencing traffic jam in the cities

Table 3: Factors influencing traffic jam in the cities

Factors influencing traffic jam in the cities	N	Mean	Std. Deviation
Indiscipline drivers	3	2.3333	1.15470
Poor urban planning	3	2.0000	1.00000
Limited car parking	3	2.0000	1.00000
Concentration of most social economic activities	3	2.3333	.57735
Increase of private vehicles	3	2.6667	.57735
Unregulated road junctions	3	2.6667	.57735
Temporary road functions	3	2.6667	.57735
Temporary road closures	3	1.0000	.00000
Poor road network connections	3	1.6667	.57735
Poor land use policies	3	2.6667	.57735
Road repairs	3	1.6667	1.15470
Informal street and roadside trade	3	2.6667	.57735
Poor bumpy roads with potholes	3	2.6667	.57735
Poor lanes and disorderly roads	3	1.6667	1.15470
Construction activities	3	2.0000	1.00000
Poor law implementation	3	2.0000	1.00000
Morning peak hour	3	1.6667	1.15470
Selfish driving	3	2.6667	.57735
Careless pedestrians	3	2.6667	.57735
Slow flow of the road users	3	2.0000	1.00000
Kabaza interference	3	2.0000	1.00000
Heavy traffic	3	2.0000	1.00000
High demand of transport services	3	2.0000	1.00000
Violation of traffic rules	3	2.0000	1.00000
Inadequate roads	3	2.0000	1.00000
Valid N (listwise)	3		

Table 3 shows that the major causes of traffic jam in Kampala, Kigali and Lilongwe are increase of private vehicles, unregulated road junctions, temporary road function, informal street and roadside trades, and poor bumpy roads with potholes. The findings from this study indicate that these factors play a major role in influencing traffic jam with the biggest mean of 2.6667 and the smallest standard deviation of .57735. The small standard deviation shows that there is homogeneity in the factors influencing traffic jam in the three cities.

More to above poor urban planning, limited car parking, construction activities, poor law implementation, slow flow of the road users, Kabaza interference, heavy traffic, high demand of transport services, violation of traffic rules and inadequate roads among others all with a mean of 2.0000 and a standard deviation of 1.00000 implies that these facets contribute to transport jam to a moderate level. In addition, in disciplined drivers, concentration of most social economic activities influences traffic jam positively with a mean of 2.3333 and a standard deviation of 1.1547. Poor road network connections, road repairs, morning peak hour and poor lanes and disorderly roads with a big mean of 1.15470 are other factors that favor traffic jam. The high standard deviations are an indication that there is no homogeneity in these factors that influencing traffic jam in the three cities.

Traffic jam control initiatives existing in the cities

In Kampala, Kigali and Lilongwe the following were identified as the key control initiatives:

- Improving the conditions of city roads
- Enforcing traffic laws
- Widening existing roads
- Researching on traffic management
- Limiting some roads to buses only
- Providing adequate parking
- Building flyovers
- Encouraging use of traffic devices
- Using non-motorised means of transport

Analysis of the indicators of traffic jam in the cities

Table 4: Analysis of the indicators of traffic jam in the cities

Indicators of traffic jam in the cities	N	Mean	Std. Deviation
Many motorcycles and vehicles	3	2.3333	1.15470
Breaking and horning	3	1.6667	.57735
Increased delays (staying in queue for long hours)	3	2.0000	1.00000
High rate of roadblocks	3	2.3333	1.15470
Valid N (listwise)	**3**		

Table 4 implies that the main indicators of traffic jam among the three cities are: Many motorcycles and vehicles, high rate of roadblocks with the highest mean of **2.3333** and a standard deviation of 1.15470 is an indication that there is no homogeneity among the variants. In addition, increased delays with a mean of 2.0000 and a standard deviation of 1.00000. A lot of breaking and horning with the least mean of 1.6667 and a standard deviation of .57735 indicating homogeneity among the variants.

5. Conclusion and Recommendations

The study concluded that most of the jam in cities is as a result of weakness of the law and indiscipline road users.

The study recommended that, more flyovers should be constructed to replace roundabouts, promote public transport, sensitization of road users, enhance and improve urban planning and implement and enforce road safety and traffic rules.

References

Agyapong, F & Ojo, T. K. (2018). Managing traffic congestion in the Accra Central Market, Ghana. *Journal of Urban Management, 7*(2), 85–96.https://doi.org/10.1016/j.jum.

Ali *et.al* (2012), Concerns, challenges & options for suitable in developing countries, *Sustainable transport for development Countries: Concerns, Issues &Options.*

Buchanan, C & Crow, G. (1974). An Integrated Transport System. Journal of the Royal Society of Arts, 122(5211), 117-128. City of Kigali Development Plan 2008- 2012

Bang, K.-L. (2006). Microscopic Traffic-Emission Simulation and Case Study for Evaluation of Traffic Control Strategies.

Balcombe *et al*, (2004). Technique identification for road traffic jam solution in Talega on Dabhade state highway-55

Kwikiriza, B.C. (2016). *Causes and effects of traffic congestions.* Pp 1-15. Research Gate

Das, D & Keetse, M (2014). Assessment of Traffic Congestion in the Central Areas (CBD) Of South African Cities- A Case Study of Kimberley City accessed in https://pdfs.semanticscholar.org/5bf3/931176f c862f110722721d33d917f396bdb2.pdf

Downie (2008). Traffic jam-causes and solutions: a study of talega on Dabhade city. *J. Inf. Knowl. Res. Civil Eng* (1), 160-163.

Harelimana, V., Umuhuza, K.A.S., Gapfizi, P & Bizabarimana, F. (2019). Traffic congestion mitigation and alleviated measures in Kigali city, Rwanda. *World Journal of Engineering Research and Technology,* 5(5), 338-359.

Hitiyaremye, E., Mbanzabugabo, JB & Uwitonze, G. (2018). Impact of Intelligent Road Traffic Control in a Technologically Connected Vehicle Environment. *International Journal of Computer Science Trends and Technology*, 6(3)

Jain, V., Sharma, A., & Subramanian, L. (2012). Road traffic jam in the developing world. In *Proceedings of the 2nd ACM Symposium on Computing for Development.*

Jonathan Levine, Joe Grengs, Qingyun Shen and Qing Shen (2012), "Does Accessibility Require Density or Speed?" *Journal of the American Planning Association,* 78, (2)157-172.

Jean-Philippe Boulet (2014). Cargo ship on Gatun Lake, part of the Panama Canal, in the historic Canal Zone, Panama.

Joseph Ssenyange (2014). *A Traffic congestion level monitoring system in crowded developing world cities.* Unpublished Dissertation Makerere University

Kayijuka, I. (2017). Mathematical Study for Traffic Flow and Traffic Density in Kigali Roads. *World Academy of Science, Engineering and Technology International* Journal, (10) 2016

Mahmud, K., Gope, K., & Chowdhury, S. M. R. (2012). Possible causes & solutions of traffic jam and their impact on the economy of Dhaka City. *Journal of Management and Sustainability* (2), 112.

Mambule Dan Mwanje (n.d). Causes and cost of traffic jams in Kampala. *The Ugandan Journal of management and public policy studies*, pp 63-81. Uganda Management Institute.

Masengesho, J.C. (2017). Traffic Jam in Kigali City, Case Study: Kigali City .www.academia.edu

Ministry of Transport and Public Works (2017). Malawi National Transport Master Plan Urban Transport Sub-Sectoral Plan from www.malawi.gov.mw.

Nyarko, R, A (2014). The causes and effects of traffic jam on commercial transport operations. A case study of trotro drivers at Awutu Senya East Municipality. University of Ghana http://ugspace.ug.edu.gh

Nguyen, M.Q., Phan, T.T.X., & Phan, T. H. (2019). Traffic Congestion in Researchgate https://www.researchgate.net/publication/336 229204_Traffic_Congestion.

Raheem, S.B., Olawaoore, W.A., Olagunju, D.P., & Adekun, E.M (2015). The Cause, Effect and Possible Solution to Traffic Congestion on Nigerian Road. Case Study of Basorun-Akobo Road, Oyo State) accessed from https://www.researchgate. net/publication/282246248.

Remi, *at el.* (2009), Pune's Chaotic Traffic-Problems and Solutions.

Richards (1990), Research Methodology: Methods and Techniques 2rded. New Age International Publisher

Richard Dowling, *et al.* (2008), *Multimodal level of service analysis for urban streets, NCHRP Report 616,* Transportation Research Board.

Rodnique *et al.* (2009). *Perception of Public Transportation, in Public Transportation Planning, Operations, and Management George E. G. and Lester J. (eds) Prentice-Hall INC.* Englewood Cliff, New Jersey.

Shamsher (2013). *Urban mobility report on transport plan for Dhaka City and traffic jams stop everything but the clock.*

South, J., & Warwick-Booth, L, (2010). *Traffic jam, Causes and solutions in Bangladesh: A study of Chittagong Metropolitan City Asian Business*

Vecantaya, L., Pudaruth, S., Dirpal, G., & Narain, V. (2018). Assessing the causes & impacts of traffic congestion on the society, Economy and Individual: A case of Mauritius as an Emerging Economy in *Studies in Business and Economics, 13 (3)2018*

Wan Ghazali, W. N.W.B., Zulkifli, C.N.A.B., Ponrahono. Z. (2019) *The Effects of Traffic Congestion on Quality of Community Life*, presented at ICRP: 4th International Conference in Rebuilding Place accessed at www.Future Academy.org.UK.

Zhang (2011). *Federal Road Safety Corps during his Official visit to the Lagos Community and of the FRSC* on 2nd February, 2015.

Zhang. C, Peng, C & Li, J. (2013). Traffic Demand Forecast of Road in Kigali, Rwanda. *Research Journal of Applied Sciences, Engineering and Technology* 5(2): 546-552