



EFFECT OF MOTOR VEHICLE TRAFFIC CONGESTION ON THE FINANCIAL PERFORMANCE OF SMALL AND MEDIUM BUSINESS ENTERPRISES IN NAIROBI COUNTY

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Abstract: *Motor vehicle transport within Nairobi County is a key determinant in the economic growth of Kenya because of significant contribution to the country GDP. This research seeks to determine how motor vehicle traffic jam influences the financial performance of SMEs operating within Nairobi County. Descriptive research design was used in this research. The target population consisted of all SMEs operating within Nairobi County. The sample of this study consisted of 80 Small and Medium Enterprises. Sampling was carried out using stratified random sampling method. A structured closed questionnaire was used for data collection. This study targeted SMEs in the business, manufacturing and service sectors. Multiple regression analysis was used in the data analysis. The output was presented using charts, tables, descriptive statistics and correlation analysis. From the analysis of the responses, the results clearly showed that there exists a strong positive relationship between motor vehicle traffic congestion or decongestion and SMEs financial performance.*

Keywords: *Motor Vehicle, Traffic Congestion, Financial Performance, SMEs*

1. INTRODUCTION

Traffic Congestion has largely affected the country at large particularly Nairobi County. In the 1980's most investors main aim was to increase and improve both private and public transportation system with little attention to how such an increase in motorized vehicles would affect the traffic flow within the major towns and cities in Kenya consequently affecting the overall economic growth. In 2008, a report written by JICA quoted that the



number of vehicles in Nairobi was estimated to be over 300,000 .There has been an unlimited increase in the existence of both vehicles and people in Nairobi this can only make the problem worse.

Due to the traffic congestions, Enterprises have to account for the amount of fuel they will use as they are on traffic and also the amount of time they would have taken while on traffic. All these would then be factored in pricing a given product then passed on to the end consumer of the product .As a result, the products become less competitive in the market. For people commuting to work roughly take one to two hours on traffic jam for a distance of between 10 -15 kilometers many people therefore opt leave their homes at 5:30am so as to avoid the madness of the traffic. In most case this people will end up being caught in traffic as they head back home hence leading them to arrive home earliest 7:00 am after leaving work at 5:00pm spending two more hour in traffic. Most of these people have families and therefore have other homely duties to handle when they get home meaning bed time will most likely be three hours after they get home , By mid week most people begin getting fatigued hence become very unproductive at work .Offices of enterprises end up having walking zombies working for them. Unproductiveness leads to less work being done, less income, more cost incurred among many other implications this therefore begins the downfall of small and medium enterprises.

The main focus of the Ministry of Trade is the growth and progression of SMEs in the country. The Ministry is implementing programs that are directed to minimize hurdles experienced by SMEs (Ali, 2010). The funds are being allocated to SMEs through initiation of special programmes by the banks and other lending institutions. The national, county government and other stakeholders continue to push for efficient management to ensure effective results due to the contribution of the SMEs especially in the creation of employment opportunities, economic stimulation and poverty reduction.

2. LITERATURE REVIEW

2.1 Traffic Flow Theory

Kerner (2009) has placed road congestion solely on the interplay of shippers and people's needs and desires yet when one looks at the situation practically, lack of proper



infrastructure and an efficient regulatory framework to control traffic has contributed more to the congestion (wards research, 2014). In Nairobi, the chaos on the road are a shock to anyone who visits the city for the first time, one is treated to an endless flow of people and mass transit buses that never seem to end and ward's research (2014) through its publication commented on the fact that to that due the limited nature of Nairobi's infrastructure, efficient policies have to be formulated that will try to bring sanity in Kenyan roads.

2.2.2 Queuing Theory

Queueing theory describes traffic flow especially during peak hours when the density is high. High density due to more vehicles on the roads causes congestion in the road bottlenecks slowing traffic and in many instances causing jams. This jam has been known to slow the rate of economic growth down due to lost time resources sitting in traffic. With increase in public transport services more people will use public transport which will reduce the amount of vehicles on the road thus decreasing jams which will translate to faster and cheaper transport which will have a positive impact on the economy (Dachis, 2013).

2.3 Empirical Studies

International Evidence

Harriet, Poku and Kwabena (2013) carried out a study on the assessment of traffic congestion and effects on productivity in Urban Ghana using descriptive statistics to analyze the data. The results revealed that movement in Kumasi Metropolis is highly restricted traffic congestion, which leads to more delays especially during peak hours which negatively influences productivity. The study recommended that transport infrastructure expansion and implementation of good management policies should be given more attention to reduce transport congestion within the Metropolis which improves productivity and economic benefits.

Anderson (2013) examines the impact of public transit on traffic congestion using a simple choice model and found that public transit such as strikes, subways and slowdowns have



insignificant effect on the congestion relief. This study also found that the net benefits of implementing transit system appear more than before.

Mcknight, Levinson, Ozbay, Kamga and Paaswell (2003) on their report on the impact of traffic congestion on bus operations and costs to New Jersey transit found that traffic congestion as a result of decline in traffic speed due to population and economic growth has a significant impact on New Jersey transit bus operations and costs.

Levy, Buonocore and Stackelberg (2010), on their study on the assessment of the public health risks of traffic congestion which is a function of road infrastructure, population increase, and atmospheric situation found that public health impacts range more than an order of magnitude less in excess of economic gains. This study concludes that public health effects should be considered in future government policies to avert the traffic congestion in places considered to be urban.

Yang, Chen, Qin, and Fangwen (2015) examined the effect of subway expansion on traffic conditions evidence from Beijing using fine scale daily traffic records. The findings show that by constructing subway can motivate private car users to give up their vehicles and move on to use subway but this stand alone strategy is adequate to avert or to solve the problem of traffic congestion.

Weisbrod, Vary and Treyzd (2003) measured the economic costs of urban traffic congestion on business within metropolitan areas. The general objective was to examine the sensitivity of goods and services to traffic congestion by analysing its impact on cost of business, levels of production and productivity. The findings show that traffic congestion depends on the industry sector required inputs for production such as demand for skilled labor, specialized inputs and huge transportation of products to the market. Further, this research found that implementation of congestion reduction strategies can induce more traffic jam dues as a result of incremental economic benefits.

Davis, Joseph, Raina, Jagannathan (2017) conducted a case study on the congestion costs on Indian roads particularly in New Delhi. The findings show that economic costs incurred as a result of loss in productivity is purely as a result of buses congestion in the city. Further this



study suggested that the incremental fuel wastage should a clear sign to the government to implement intelligent traffic management system to minimize the loss.

Marchesini & Weijermars (2010) on their study to determine the relationship between road safety and congestion on motorways found that crash likelihood is positively associated to speed variability and speed between lanes and density variability. This research further found that crash severity decreases with increasing volumes and does not change from changing from free flow to congested conditions.

Shanko (2015) carried out a study on segmental assessment of levels of traffic jam on Kality ring road to Dunkem Bridge. The findings show that the effect of motor vehicles when the location is bottleneck is at the top of the upgrade than when bottleneck is at the bottom of upgrade. Further the study found that the effects of heavy vehicle increases with increase in grade percentage of congested traffic stream.

Mackett (2012) conducted a research in London that tried to find ways of reducing private car use and in turn reduce congestion in the streets of London which had led to significant loss in the economy. The buses as an alternative were floated as a possible solution to the problem (INRIX, 2013).

The American Economic Review (2011) found that more vehicles were driven as more lines were constructed thus building new roads and widening existing ones only resulted in additional traffic that continued to rise until peak congestion returned to the previous level. This revealed further the tragedy of the commons that by making 'free' the high ways and the road network traffic congestion will still be there unless a new nonstructural solution is found.

Nyarko (2014) is carried out a study on the causes and effects of traffic congestion on commercial transportation operations in Senya East Municipality. This study relied on mixed research approach where a survey was conducted to trotro drivers and commuters. The findings shows that traffic jam is mainly caused by increased number of cars, poor status of roads, bad parking and stopping by vehicles which reduces the number of trips in a day



which leads to decreased revenues. This study concludes that traffic congestion can be averted by construction of railways lines and rehabilitation of roads among other measures. According to Social economic unit (2013) on their study on the social-economic costs of traffic congestion in Lagos found that traffic jam in the city is mainly caused by the following factors, drivers attitude, drivers behavior, road users, increase in vehicle ownership or the total number of cars registered on annual basis, cost of transport, availability of parking as well as private car perception compared to public transport. This study concludes that, traffic congestion can be reduced if the government can strictly implement the following policies such as increasing road capacity, reducing extra traffic check, initiating more parking restrictions, adopting traffic technologies, expanding bus routes, increasing the number of transport buses in the city, adopting flexible working hours, imposing congestion charges among other measures.

Kenyan Evidence

Kibunja (2009) examined the problems caused by traffic congestion along uhuru highway. This study also revealed the main contributing factors to traffic congestion along uhuru highway. The findings of this study shows that inefficient management of existing road capacity, mixing of city traffic with city centre traffic, inadequacy of traffic management system for the highway, poor road user behaviors, institutional irregularities, mismanagement of parking areas, inadequate transport infrastructure, unrestricted demand, poor management and unhealthy competition and insufficient capacity are the main problems leading to high traffic congestion along Uhuru highway.

Mosoti and Moronge (2015) on their study on the effect of motor vehicle congestion on the economic performance of Kenya limited to Nairobi City County found that the number of hours lost due to excessive traffic jam costs Kenya economy due to increased cost of production. Further, the research affirmed that motor vehicle transport especially public transport serves as the nerve centre that brings together the operational efficiency of Nairobi County and due to poor management no measure have been put in place to address this problem of traffic congestion.

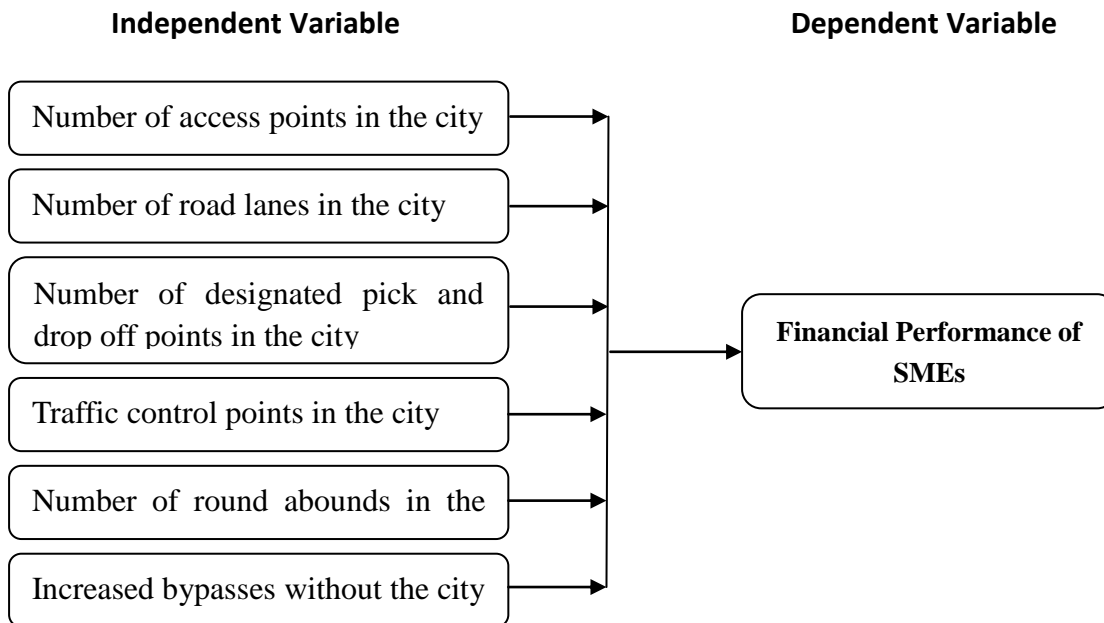


Figure 1 Conceptual Framework

3. RESEARCH METHODOLOGY

This research used descriptive cross sectional research design. Descriptive cross-sectional research design provides clear picture of the situation, event, phenomena and person during data collection.

Target Population

The target population comprised of 80 SMEs operating within Nairobi County.

Sampling Procedure

Due to time factor and costs SMEs were stratified depending on their sector area for instance business, service or manufacturing from which 60 SMEs were selected to form the sample size.

Table 4.1 Sample size

Sector	Target Population	Sample size	Percentage of population
Business	40	30	37.5
Service	25	20	25
Industrial	15	10	12.5
Total	80	60	75

Data Collection Procedure

The questionnaire was the primary data collection tool in this research. The questionnaire



was administered to SMEs which consisted of multiple and pre-structured questions.

Data Analysis

Multiple regression analysis model was used to relate independent and dependent variables in this study. The regression model is as shown;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu$$

Where:

Y= Financial performance

α = Constant

β_i = Coefficients

X_1 = Number of access points in the city

X_2 = Size of road lanes in the city

X_3 = Number of designated pick and drop off points in the city

X_4 = Traffic control points in the city

X_5 = Number of roundabouts in the city

X_6 = Increased bypasses without the city

μ = Error term

4. RESULTS AND DISCUSSION

Response rate

As shown in Table 4.1, the sample size for this study was 80 SMEs. Out of the sample size, 60 filled in the questionnaires and returned them on time thus making a response rate of 75%.

Table 4.2 Classification of SMEs

Sector	Percentage
Business	52.5%
Service	20%
Manufacturing	27.5%

The findings showed that most of the sampled respondents in this study are in the business and manufacturing sector SMEs with 52.5% and 27.5%. 20% of the respondents offer services and other business related services.



Table 4.3 The extent to which traffic congestion affects SMEs performance

	Percent
Very large extent	15%
Large extent	28%
Moderate	30%
Little extent	15%
Very little extent	12%

From the analysis of the extent to which traffic congestion effects the SMEs performance based on the likert scale, it was found that 30% of the sampled SMEs were moderately affected by the congestion with 28% and 12% been affected largely and very lowly by the traffic congestion.

Table 4.4 Rating the Effectiveness of traffic control measures

	Percent
Very effective	15%
Effective	14%
Moderate	46%
Ineffective	10%
Very ineffective	15%

From the analysis of the traffic control measures, it's very clear that 46% of the sampled respondents indicated that government policies have a moderate effect to minimize traffic congestion in the city with 15% indicating that the government policies will be very effective and ineffective at the same time in the long run. 14% of the respondents believe that government policies are effective only that its effect has not been translated into monetary terms.

Table 4.5 Motor vehicle traffic control policies

	Mean	Std. Deviation
Establishing public transport lanes	3.56	1.31
Banning public transport vehicles from the CBD	3.93	1.87
Banning private vehicles from the CBD	3.43	1.25
Introducing rail trams to serve city estates	2.57	1.41
Relocating government offices from the CBD	3.17	1.32
Changing Nairobi status from capital city	2.90	1.40

The respondents were asked to state the extent to which motor vehicle government policies adopted in Nairobi County influences the operational performance of SMEs according to the



following scale (1-Very great extent, 2-Great extent, 3-Moderate extent, 4-Least extent and 5-Very Least extent).

From the analysis of other suggested traffic management policies such as banning public transport vehicles from the CBD and increasing public transport lanes were greatly rated by sampled respondents while banning private vehicles from the CBD, introducing rail trams to serve city estates, relocating government offices from the CBD and changing Nairobi status from the capital city were moderately rated by sampled respondents in this study. Further, this study found that, increased status in the city, increased cost of implementing legislation, poor management and infrastructure, poor roads structure and design have moderately contributed to increased congestion in the city while increased number of vehicles having not contributed much to overwhelming congestion experienced in the city.

Table 4.6 Correlation Analysis

		ROA	Access points	Service lanes	Drop & pick off points	Traffic control points	Number of bypasses
ROA	Pearson Correlation	1	.287	.161	.461	-.341	.317
	Sig. (1-tailed)		.228	.213	.133	.168	.227
	N	60	60	60	60	60	.60
Access points	Pearson Correlation	.287	1	.543**	-.107	.008	.008
	Sig. (1-tailed)	.228		.007	.327	.486	.486
	N	60	60	60	60	60	60
Service lanes	Pearson Correlation	.161	.468**	1	.012	-.074	-.074
	Sig. (1-tailed)	.312	.120		.523	.378	.378
	N	60	60	60	60	60	.60
Drop & pick off points	Pearson Correlation	.461	-.107	.001	1	.391*	.391
	Sig. (1-tailed)	.133	.327	.498		.044	.044
	N	60	60	60	60	60	60
Traffic control points	Pearson Correlation	-.341	.001	-.098	.176*	1	.211
	Sig. (1-tailed)	.168	.246	.128	.071		.296
	N	60	60	60	60	60	60
Number of bypasses	Pearson Correlation	.317	.008	-.074	.391*	.211	1
	Sig. (1-tailed)	.227	.486	.378	.344	.296	
	N	60	60	60	60	60	60

Table 4.6 shows correlation analysis, the findings shows that there is a weak positive relationship between ROA and number of motor vehicle access points in the city ($p = 0.287$,



$p > 0.05$). This shows that the number of access points in Nairobi city has minimal influence on the traffic congestion experienced in the city. The relationship between return on assets and size of transport service lanes is positively weak ($p = 0.161$, $p > 0.05$). Transport service lanes have very minimal impact on reduction of traffic congestion in the city. The study also found that there exist a strong positive correlation between return on assets and number of designated pick and drop off points in the city ($p = 0.461$, $p > 0.05$). This shows that increased number of pick drop off points as witnessed recently in the city have a very significant influence on the operational and financial performance of SMEs located in Nairobi County. The relationship between ROA and increased number of traffic control points in the city was found to strongly positive ($p = -0.341$, $p > 0.05$). ROA and increased number of roundabouts in the city was found to be strongly negative ($p = -0.410$, $p > 0.05$). This shows that increase in roundabouts significantly contributes to increased traffic congestion in the city thus affecting the performance of SMEs. This study shows a positive association between ROA and number of bypasses without the city ($p = 0.227$, $p > 0.05$).

Table 4.7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.721	.519	-.0279	.1021

Source: Research Findings

The findings also revealed that traffic congestion influences SMEs financial performance to great extent. Table 4.7 shows R^2 value of 51.9%. This value indicates that the increased number of access points in the city, increased number of service lanes, increased number of designated pick and drop off points, increased number of traffic control points, increased number of roundabouts and increased number of bypasses explains 51.9%.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study seeks to determine how traffic congestion influences the financial performance of SMEs in Nairobi County. This study found that uncontrolled increase in population, increased status in the city, increased cost of implementing legislation, poor management and infrastructure, poor roads structure and design significantly contributes to increased motor vehicle congestion in the city while increased number of vehicles as most of the respondents



suggest has not contributed much to overwhelming traffic congestion experienced in the city. Government policies such as banning public transport vehicles from the CBD, increasing public transport lanes, banning private vehicles from the CBD, introducing rail trams to serve city estates, relocating government offices from the CBD, increasing number of bypasses, automating traffic control, increasing number of transport lanes and reducing number of roundabouts and changing Nairobi status from the capital significantly contributes to minimize motor vehicle traffic congestion in the city.

5.2 Conclusion

The results in this study clearly show that motor vehicle traffic congestion or decongestion influences SMEs financial performance. This study concludes that reducing the number of traffic control points, controlling the total number of motor vehicle access points in the city, reducing the number of roundabouts, increasing the size of transport service lanes, reducing the number of designated pick and drop off points for public and private transport in the city and number of bypasses without the city are key determinants of motor vehicle decongestion the city which directly influences the operational efficiency and financial performance of SMEs operating in Nairobi City.

5.3 Recommendations

More research can be carried out in other SMEs operating internally and externally to gather adequate information that can be used to formulate a sustainable framework for advising the SMEs on the value expected from the government on the ease of motor vehicle traffic congestion.

Another study can be undertaken to measure the economic impacts of traffic congestion as a result of truck delivery in the city. Further studies can be conducted to investigate the costs of specific traffic congestion policies in different types of allocated land use and economic structures.

A comparative study can be carried out on SMEs in diverse environments within or without the county in order to understand the benefits and challenges experienced by SMEs when undertaking their operations in Kenya.

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