EFFECT OF THE REGULATORY ENVIRONMENT ON THE RELATIONSHIP BETWEEN STRATEGIC TRANSPORT INTEGRATION AND SUSTAINABLE MOBILITY OF MATATU SACCOS IN NAIROBI COUNTY, KENYA

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Abstract

Purpose: The purpose of this study was to establish the effect of the regulatory environment on the relationship between strategic transport integration and sustainable mobility of Matatu Saccos in Nairobi County, Kenya.

Materials and Methods: The study was guided by Positivism philosophy while descriptive research design was adopted. The target population was 177 Sacco Managers and two representatives, one from MOT and other from MVOA respectively. The whole population of 179 respondents was used in the study hence; the study employed the census approach. The questionnaire was pilot tested on 18 respondents who were selected randomly. The study applied Cronbach's alpha and the results displayed a high level of internal consistency hence infers that the research tool used in the study was reliable. The data collection instrument was a semi-structured questionnaire, which were dropped and picked later. A semi-structured interview guide was also used. Data was analysed using descriptive and SPSS Version 24.

Results: The findings indicate that there exists a statistically significant, positive effect of strategic integration on sustainable mobility of Matatu Saccos in Nairobi County, Kenya. The R square in the moderated models changed from 71.3% to 80.9% indicating 9.6% increase in variation as a result of the regulatory environment moderating effect. Further, the increase was statistically significant; this implies that regulatory environment does significantly moderate the effect of strategic integration and sustainable mobility of Matatu Saccos in Nairobi County, Kenya.

Unique contribution to theory, practice and policy: The study recommended that both the Ministry of Transport and Sacco management develop a punitive measure to curb corruption. The other recommendation is that they should also develop regulatory policies to ensure that vehicles are regularly inspected to confirm their minimum road worthiness to increase safety and increase passenger comfort. This will also promote green environment that will reduce the health hazards of vehicle emission. Additionally, the policy can enhance traffic discipline which is poorly enforced. and also provide basic statistics on transport system.

Key words: *Regulatory Environment, Strategic Transport Integration, Sustainable Mobility*

1.0 INTRODUCTION

Regulatory restrictions are one area in which business people and entrepreneurs need to be facilitated so that they become formal and grow. If regulations are friendly such as registration process and tax rates are clear and affordable, the small-scale businesses will openly operate and contribute to the economy more than, at what it's doing currently. (G.O.K Sessional paper 1, 1996). Chitere et al. (2011) assert that institutional fragmentation in the Matatu sector is a key obstacle to road transport planning. However, with the formation of the National Transport and Safety Authority (NTSA), all road transport functions such as motor vehicle inspection, motor registration and licensing, driver testing and licensing have been brought under one roof of NTSA.

Regulations in the public transport sector in Kenya are spearheaded by N.T.S.A which is a government body founded in 2012. McCormick (2013). The regulations in the public transport sector are in the form of laws and by-laws. The government, to protect its citizens, has passed the following legal notices No. 161 of 2003, No. 83 of 2004, No. 65 of 2005, No. 209 of 2010. McCormick et al. (2013) koster (2016). The laws in the sector are seen as seasonal as they keep on changing to reflect modern day needs. McCormick 2013 noted that most public vehicles evaded schedules and do not take them seriously to a point where they pick and drop passengers anywhere along the way causing obstructions and congestion. Ference 2013 also goes on to say that, passengers encourage some of the evils committed by the public transport vehicles. The new reforms and regulations in the public transport Legal Notice No. 23 of 2014 focused on all PSV to be members of Sacco's or limited companies for them to be licenced. The emerging policy is concerned with the availability of, profitability, and affordability of PSV transport (KIPPRA, 2011). These policies are; Tax policy and how it impacts on the supply of more PSVs to meet the transport demand, business operations and financial viability. Other policies are those related to the cost of insurance, disposal of junk vehicles policy, sources of investment capital and its effect on the number of PSVs on the road.

The new reforms and regulations in the public transport policy are expected to streamline the operations in the industry for safety and comfort of passengers and increase profitability in the business (Githinji, 2011). According to Behrens (2011) the government seeks to streamline and regulate the public transport sector by restoring order, reducing fatal accidents increasing passenger comfort and increase revenue for the Matatu owners. Despite the rapid growth and outstanding contributions of the Matatu industry, it has faced many problems. Excessive regulatory constraints inhibit business competitiveness worldwide. Kenya is striving to industrialize, but often, government policies or their absence provokes immense costs and adverse reactions by the entrepreneurs. Sometimes the policies or regulations are at fault during the times of their implementation (Ikiara, 2010). Some of the regulatory bodies include; Kenya Roads Board (KRB) which was enacted by CAP 408A of 1999 as the principal advisor on all matters relating to road maintenance, and funding through the Road Maintenance Levy Fund. Secondly, there is the Kenya National Highways Authority (KeNHA) which was enacted by CAP 408 of 2007 and mandated for management, development, rehabilitation and maintenance of for major roads classified as A, B and C. In addition, the Authority advices the Ministry on technical issues such as standards, axle load, research and development. The Transport

Licensing Board (TLB) was established by section 61 of the Traffic and Road Safety Act, 1998, with the core mandate of issuing the licenses and allocation of routes.

1.1 Statement of the Problem

Matatu Saccos dominates the main transport in Kenya and especially the urban sector accounting for over 80% of the country's total passenger transportation. The sector is a pillar in the development of the economy in the country through direct and indirect employment as well as promoting individuals who offer other services in the transport sector. The Matatu Sacco is not only preferred choice for many commuters but the only option to those commuters who do not have the luxury of owning their own vehicle since it has an elaborate transport network of routes which transverse the whole country. The significance of the Matatu Sacco sector in economic creation cannot be gainsaid. The sector is the fifth largest contributor of formal employment and the fourth largest contributor of informal sector jobs in Kenya (Republic of Kenya, 2011). Inspite of the significant role played by the Matatu Sacco in Nairobi County and the Country at large, the sector is associated with several challenges. Among the challenges are lack of sustainable mobility with the following ripple effect of traffic jams and death, dangerous driving behaviour, environment pollution, economic problems and social issues affecting the cities and the life of the city dwellers with an equal breath.

Despite the many interventions carried out by the government to streamline the Matatu Sacco to attain sustainable mobility, the situation persists. The government has established several bodies like NTSA, TLB, KeNHA, KURA, NAMATA, among others to create synergy in the sector. Other interventions such as the marking and mapping out of the red lane (lip stick lanes) on Thika and Mombasa road, and the free-car plans for two days, the situation is still grim. The implementation of the famous Michuki laws (via legal notice No. 161 of 2003) gave a form of normalcy and orderliness for a time, but its fading with time. Finally, the registration of all Matatu into Saccos or companies is bearing fruits as they have developed terms of service and codes of conducts for their owners and Sacco managers. The duo and other stakeholders have a potential of transforming. Through its operation, the Matatu Sacco have always suffered the love- hate relationship with the players and its absence in the streets of Nairobi during strikes makes the city to come to a standstill and this provokes the following questions. "Is banning the services offered by Matatu Saccos in Nairobi County the solution?'' "Or having the two car free days?" "Or is strategic transport integration and sustainable mobility the only option for the Matatu Saccos?" is it the option what will give the Nairobians an end to the Matatu nightmare? Given the above-illuminated gap, the researcher was motivated to carry out this study, entitled Strategic Transport Integration and Sustainable Mobility on Matatu Saccos in Nairobi County, Kenya.

2.0 METHODOLOGY

The study was guided by Positivism philosophy while descriptive research design was adopted. The target population was 177 Sacco Managers and two representatives, one from MOT and other from MVOA respectively. The whole population of 179 respondents was used in the study hence; the study employed the census approach. The questionnaire was pilot tested on 18

respondents who were selected randomly. The study applied Cronbach's alpha and the results displayed a high level of internal consistency hence infers that the research tool used in the study was reliable. The data collection instrument was a semi-structured questionnaire, which were dropped and picked later. A semi-structured interview guide was also used. Data was analysed using descriptive and SPSS Version 24.

3.0 RESULTS

3.1 Descriptive statistical Analysis Results

3.1.1 Descriptive Statistics on Regulatory Environment

Respondents were asked to indicate the degree to which they agreed with regulatory environment statements. The measurable indicators were ranked on a 5-point Likert-type scale, ranging from 'strongly disagree' (1) to 'strongly agree' (5). Study findings are summarized is in Table 1.

Table 1: Descriptive results for Regulatory Environment

	Percentage (n=135)					Mean	Std. Dev
	SD	D	N	A	SA		
All the vehicles in the Sacco have PSV license	4.4	16.3	26.7	32.6	20	3.5	1.1
All the vehicles pay the road service license (TLB) fee	0.7	9.6	24.4	40.7	24.4	3.8	0.9
Adhering to KeNHA rules enhances public image of Matatu Saccos	0	9.6	28.9	35.6	25.9	3.8	0.9
Introduction of the new Transport Policy Reforms have enhanced comfort during travel	1.5	8.1	28.1	40	22.2	3.7	0.9
Adherence to NTSA rules and regulation would enhance public image of Matatu Saccos	1.5	6.7	22.2	35.6	34.1	3.9	1.0
Overall average						**3.7**	**1.0**

SD- Strongly Disagree, D- Disagree, N-Neutral, A-Agree, SA-Strongly agree

The results indicate on table 1 reveals that respondents agreed that adherence to NTSA rules and regulation enhances public image of Matatu Saccos. The assertion had a mean response of 3.9 with a standard deviation of 1.0. This means that there was a high variation in the responses from the respondents concerning adherence to NTSA rules and regulations. The respondents agreed that all the vehicles pay the road service license (TLB) fee, as shown by a mean response of 3.8 with a standard deviation of 0.9. The findings support Ndungu, Kibua and Masinde (2004) who observed that under the Kenyan law, any Matatu Sacco's in public service vehicle must have an insurance cover before it is allowed to operate. Adhering to KeNHA rules enhances public image of Matatu Saccos as shown by a mean of 3.8 and a standard deviation of 0.9.

Further, the respondents indicated that introduction of the new Transport Policy Reforms had enhanced comfort during travel as shown by a mean of 3.7 and standard deviation of 0.9. The respondents also agreed that all the vehicles in the Sacco have PSV license as shown by a mean of 3.5 and standard deviation of 1.1. The new reforms and regulations in the Matatu Sacco's in public transport policy are expected to streamline the operations in the industry for safety and

comfort of passengers in the business (Muriungi, 2013). According to informant (KI_1); the government policies do not provide an enabling environment for the Matatu Sacco's in,

> *"The government does not control the tenure of office for Sacco corporation managers and does not oversee the running/ operation of the Saccos in an ethically or professional manner."*

However according to the informant (KI_2),

> *"The government provides an enabling environment for Matatu Sacco's since it has allowed completion between Matatus without the introduction of government-sponsored vehicles, e.g.,*
> *NYS matatus and buses"*

On whether the government should revise its policies on regulation of Matatu Sacco's is, informant (KI_1) indicated

> *"Yes, it should and ensure that professionals run the sector."*

According to the informant (KI_2),

> *"The government should revise its policies on regulation of Matatu Sacco's since commuters in Nairobi have increased hence the need to revise the policies."*

On whether the government was supportive in the performance of Matatu Sacco's informant (KI1) indicated

> "*It is not supportive; it needs to work closely with the Sacco, visit their offices regularly, and make sure that they use the officials when implementing any changes."*

The government has been supportive in the performance of Matatu Saccos in by encouraging the formation of Saccos to enhance accountability and force regularization of fares. NTSA was given the mandate to slap a blanket suspension on all PSV attached to a Sacco when one of them flouts the set rules of engagement (informant KI_2). Further, to support Matatu Saccos in, the government should curb corruption, help in reducing overhead costs, and strengthen the PSV to operate under the corporation and Sacco management (informant KI_1).

On changes regulatory bodies, informant KI_1 recommends that;

> *"KeNHA should provide more road signage in dangerous areas; ensure that the road maintenance is done on time. Traffic law enforcement should not be left to the police alone; more bodies need to be involved as this would help the decongestion of the courts. The traffic wardens should be used to enforce parking and manage traffic in Matatu Sacco's in the center". Informant KI_2 proposes that the government should regularly monitor Matatu Sacco's to support Matatu Sacco's in growth and ensure sanity in the Saccos.*

The findings concur with Behrens (2011) who revealed that the government should continue to streamline and regulate the Matatu Saccos by restoring order, reducing fatal accidents increasing passenger comfort and increase revenue for the Matatu owners. This means that enacting proactive policies in the Matatus sector has the potential of streamlining and enhancing the performance levels.

3.2 Factor Analysis

3.2.1 Factor Analysis for Factor Analysis for Regulatory Environment

KMO and Bartlett's show the interrelationship between key attributes of the regulatory environment in Table 2.

Table 2: KMO and Bartlett's Test for Regulatory Environment

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.741
Bartlett's Test of Sphericity	Approx. Chi-Square	209.136
	Df	10
	Sig.	0.000

As shown in Table 2, KMO coefficient of 0.741, depicted that a sample of 135 was appropriate to execute exploratory factor analysis since KMO value was greater than 0.5. Further, Bartlett's coefficient of 209.136 and p-value of 0.000 were obtained. Hence, there was significant interrelationship between attributes of regulatory environment, and exploratory factor analysis was appropriate in the study. Principal component analysis extraction method was used as shown in Table 3.

Table 3: Total Variance Explained by Regulatory Environment

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.777	55.537	55.537	2.777	55.537	55.537
2	0.816	16.325	71.861			
3	0.672	13.431	85.292			
4	0.403	8.067	93.36			
5	0.332	6.64	100			

A maximum of one factor was obtained, the factor had Eigenvalue, which was greater than 1, and its extraction sums of squared loadings were greater than 1. Further, the extraction sums of squared loadings of other factors were between the range of 2.777 and 0.332. Additionally, the contributing power of the other factors to the explanation of the variance in the variables was considered significant. Figure 1 presents the Scree plot showing Eigenvalue and variable components.
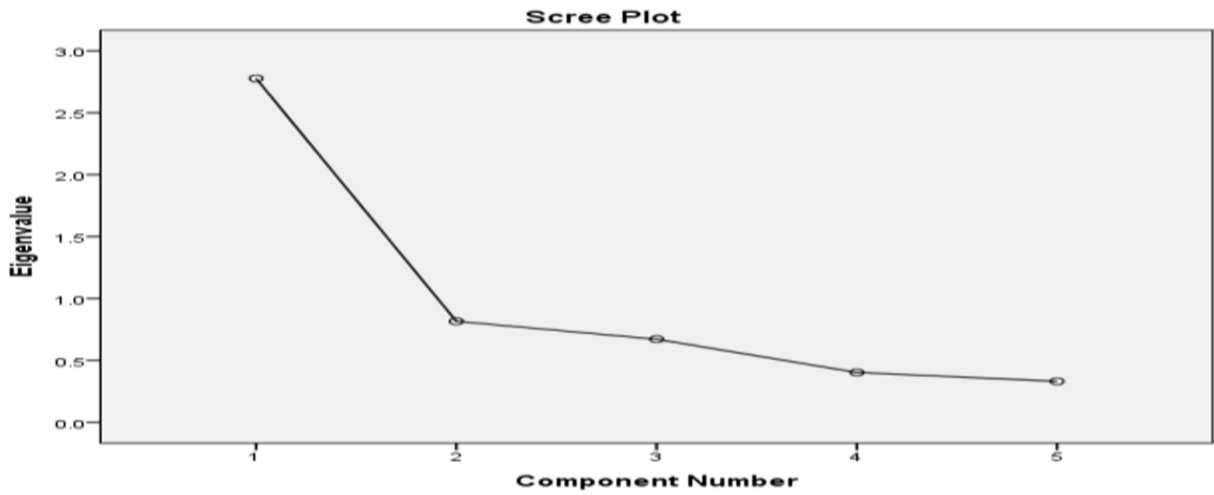
Figure 1: Scree Plot for Regulatory Environment

The scree plot is a graph of the eigenvalues against all the factors. The graph is useful for determining how many factors to retain. The point of interest is where the curve starts to flatten. All four factors were retained as depicted in Figure 1. The number of factors extracted after EFA were summarized, as shown in Table 4.

Table 4: Extracted Components for Regulatory Environment

	Component Loading
All the vehicles pay the road service license (TLB) fee	0.758
Adhering to KeNHA rules enhances public image of Matatu Saccos	0.828
Introduction of the new Transport Policy Reforms have enhanced comfort during travel	0.748
Adherence to NTSA rules and regulation enhances public image of Matatu Saccos	0.747

Extraction Method: Principal Component Analysis.

Study results in Table 4, depicted that four attributes of the regulatory framework were retained since they had factors loadings greater than 0.7. The highest was 0.828 for adherence to KeNHA rules to enhance public image of Matatu Saccos, followed by 0.758 for an attribute that all the vehicles pay road service license (TLB) fee and the least was 0.747 for adherence to NTSA rules and regulation would enhance public image of Matatu Saccos . This calls for comprehensive compliance with all regulations and guidelines for Matatu business operations since this would enhance management of PSV services.

3.3 Inferential Analysis of Integrated Ticketing on Sustainable mobility

3.3.1 Joint and Moderating Effect of Regulatory Environment on Sustainable mobility

The study examined the moderating effect of the regulatory environment on sustainable mobility of Matatu Saccos in Nairobi County. Also, the fifth hypothesis stated that regulatory environment had no significant effect on the effect of strategic integration on sustainable mobility of Matatu Saccos in Nairobi County. This was achieved through use of hierarchical

regression analysis to examine the joint effect of strategic integration on sustainable mobility of Matatu Saccos in Nairobi County. The moderating effect of regulatory environment was examined using hierarchical regression modelling.

Table 5: Model Summary on the Joint and Moderating Effect of Regulatory Framework on Strategy Integration on Sustainable mobility of Matatu Saccos in Nairobi County

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df2	Sig. F Change
1	0.844	0.713	0.704	0.607	0.713	80.648	4	130	0.000
2	0.899	0.809	0.795	0.506	0.096	12.505	5	125	0.000

Regression model summary results in Table 5, documented an overall R-squared of 0.713 which indicates 71.3 percent of the variation in sustainable mobility of Matatu Saccos in Nairobi County can be explained by integrated ticketing, Information technology, infrastructure, and employee training. When regulatory environment was introduced there was significant R squared change of 0.096, significant f change = 12.505, p value <0.05). The resultant R squared with moderated strategy integration by regulatory environment was 0.809, which shows that strategy integration and regulatory environment accounted for 80.9 percent changes in sustainable mobility of Matatu Saccos in Nairobi County. The remaining percentage can be accounted for by other factors excluded in the model. ANOVA was used to examine model goodness of fit on the effect of strategic integration and moderating effect of regulatory influence on sustainable mobility of Matatu Saccos in Nairobi County.

Table 6: ANOVA on the Joint and Moderating Effect of Regulatory Framework on Strategy Integration on Sustainable mobility of Matatu Sacco's in Nairobi County

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	119.048	4	29.762	80.648	0.000
	Residual	47.975	130	0.369		
	Total	**167.022**	**134**			
2	Regression	135.044	9	15.005	58.652	0.000
	Residual	31.979	125	0.256		
	Total	**167.022**	**134**			

Analysis of variance in Table 6 shows the F-statistics of the regression result for model 1 is $F_{(4, 130)}$ = 80.648 while the reported *p*-value=0.000 which is less than the 5% level of significance value 0.05. The model applied can thus significantly predict the change of sustainable mobility as result of the strategy integration. Hence, at least one of the slopes was non-zero. In model 2; moderated model, an F statistic of 58.652, p value <0.05, signifies significant effect of strategic integration and regulatory framework on sustainable mobility of Matatu Saccos in Nairobi

County. Results in Table 7 show the joint influence and moderating effect of the regulatory framework on strategic integration on sustainable mobility of Matatu Saccos in Nairobi County.

Table 7: Regression Coefficients on the Joint and Moderating Effect of Regulatory Framework on Strategy Integration on Sustainable Mobility of Matatu Saccos in Nairobi County

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.093	0.066		1.414	0.16
	IIT	0.367	0.129	0.264	2.846	0.000
	IET	0.426	0.187	0.322	2.280	0.000
	II	0.242	0.104	0.179	2.332	0.000
	IT	0.137	0.050	0.106	2.722	0.000
2	(Constant)	0.075	0.073		1.028	0.306
	IIT	0.220	0.105	0.158	2.102	0.000
	IET	0.146	0.052	0.110	2.790	0.000
	II	0.143	0.051	0.106	2.796	0.000
	IT	0.213	0.069	0.165	3.074	0.000
	RE	1.134	0.144	0.889	7.884	0.000
	IIT*RE	0.098	0.039	0.076	2.539	0.000
	IET*RE	0.129	0.048	0.103	2.675	0.000
	IIF*RE	0.312	0.123	0.255	2.541	0.000
	IT*RE	0.005	0.002	0.004	3.028	0.000

Regression results in Table 7 (model 1) shows that there was a positive and significant effect of integrated information technology on sustainable mobility of Matatu Saccos in Nairobi County ($\beta = 0.367$, t = 2.846, p value <0.05). This implies unit increase in integrated information technology while holding constant, integrated employee training, integrated infrastructure and integrated ticketing increase sustainable mobility by 0.367 units. Secondly, integrated employee training had a positive significant effect on sustainable mobility of Matatu Saccos in Nairobi County ($\beta = 0.426$, t =2.280, p value <0.05). This implies unit increase in integrated employee training while holding constant integrated information technology, integrated infrastructure and integrated ticketing constant increases sustainable mobility by 0.426 units.

Thirdly, integrated infrastructure had a positive significant effect on sustainable mobility of Matatu Saccos in Nairobi County ($\beta = 0.242$, t = 2.332, p value <0.05). This implies unit increase in integrated infrastructure while holding constant, integrated information technology, integrated employee training, and integrated ticketing constant increases sustainable mobility by 0.242 units.

Finally, integrated ticketing had a positive significant effect on sustainable mobility of Matatu Saccos in Nairobi County (β = 0.137, t = 2.722, p value <0.05). This implies unit increase in integrated ticketing while holding constant integrated information, integrated infrastructure and integrated employee training constant increases sustainable mobility by 0.137units.

Sustainable Mobility= 0.093 + 0.367*IIT + 0.426*IET + 0.242*II + 0.137*IT …… (4.1)

To examine the significant moderating effect of regulatory environment on strategy integration, changes in independent slope coefficients in model one were compared with model 2. There was positive and significant effect of regulatory framework on sustainable mobility of Matatu Saccos in Nairobi County (β = 1.134, t = 7.884, p value <0.05). This implies that unit increase in regulatory environment increases sustainable mobility by 1.134 units. Further, regulatory framework had significant moderating effect on integrated information technology accounted for by (β =0.098, t= 2.539, p value <0.05),, integrated employee training, (β = 0.129, t= 2.675, p value <0.05) integrated infrastructure(β =0.312, t= 2.541, p value <0.05) and integrated ticketing(β =0.005, t= 3.028, p value <0.05). These findings agreed with Chitere et al., (2011) who supported the need to amalgamate Matatu industry to enhance their performance.

The resultant moderated model is of the form:

Sustainable Mobility= 1.134 + 0.098*IIT + 0.129*IET + 0.312*II + 0.005*IT …… (4.2)

Similarly, KIPPRA (2011) supported the need to regulate PSV transport to enhance profitability, availability, and affordability. In addition, Githinji (2011) argued that enhanced regulatory environment has amplified customer satisfaction since there are clear mechanisms of addressing customer complaints. The resultant model explaining strategic transport integration and sustainable mobility is of the form:

Sustainable Mobility = 0.093 + 0.367*IIT + 0.426*IET + 0.242*II + 0.137*IT …… (4.3)

4.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The findings indicate that there exists a statistically significant, positive effect of strategic integration on sustainable mobility of Matatu Saccos in Nairobi County, Kenya. The R square in the moderated models changed from 71.3% to 80.9% indicating 9.6% increase in variation as a result of the regulatory environment moderating effect. Further, the increase was statistically significant; this implies that regulatory environment does significantly moderate the effect of strategic integration and sustainable mobility of Matatu Saccos in Nairobi County, Kenya.

Conclusion

Concerning regulatory environment, as a moderating effect it was concluded that, regulatory environment significantly moderated the influence on strategic integration on sustainable mobility in the Matatu Saccos in Nairobi County, Kenya. Conclusions can be made that all vehicles in the Sacco have PSV license and pay the road service license (TLB) fee. Adhering to KeNHA rules enhances public image of Matatu Saccos while sizeable number disagreed. It was also concluded that the introduction of the new Transport Policy Reforms had enhanced comfort

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during travel while adherence to NTSA rules and regulation would enhance public image of Matatu Saccos in Nairobi County, Kenya.

Recommendations

Strategic integration practices were seen to be important influencers of the sustainable mobility of Matatu Saccos through TLB rules, KENHA, NTSA. Therefore, the study recommended that both the Ministry of Transport and Sacco management develop a punitive measure to curb corruption. The other recommendation is that they should also develop regulatory policies to ensure that vehicles are regularly inspected to confirm their minimum road worthiness to increase safety and increase passenger comfort. This will also promote green environment that will reduce the health hazards of vehicle emission. Additionally, the policy can enhance traffic discipline which is poorly enforced and also provide basic statistics on transport system.

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