



INFLUENCE OF ROAD SAFETY STRATEGIES ON ROAD USER PRACTICES: A CASE OF SMART DRIVERS ORGANIZATION, KENYA

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ABSTRACT

This study was set out to examine the influence of road safety strategies on road user practices in Trans Nzoia County, Kenya. In this study, road safety strategies under focus were road safety training, road safety IEC materials and road safety campaigns while road user practices were centred on safe road crossing, wearing of protective clothing, speed limiting and observation of road signage. The objectives of the study were to establish how road safety training improves road user practices; determine how Information Education and Communication (IEC) materials affect road users' practices; and to assess how road-safety awareness campaigns influence practices of road users. One of the projects successfully implemented by Smart Divers Organization, Trans Nzoia Road Safety Awareness project was analysed through a mix of ex-post facto and survey research design to determine a possible road safety strategy - road user practice relationship. Results showed that there is positive correlation between individual road safety strategies and road user practices. Road user practices, as self-reported by respondents all showed that they were positively influenced by the road user training, campaigns and IEC materials they received from the implementer, SDO. In conclusion, the effectiveness of a road user strategy depends on the appropriateness of the road users. When using IEC as a road safety strategy, it is imperative to consider simplicity either of messages, pictorial or in word.

Key Words: Road Safety Strategies, Road User Practices, Training, Awareness Campaigns, Information Education And Communication

INTRODUCTION

The idea that traffic is inherently unsafe should be a starting point in improving its safety. This relatively recent insight was inspired by developments in other sectors, such as aviation and the process industry (Wegman & Aarts, 2005). The World Health Organization estimates that road traffic accidents (RTAs) cause 1.3 million deaths and 20–50 million injuries worldwide, and that by 2030, RTAs will be the fifth leading cause of death globally (WHO 2015). The problem within Kenya, an East African country, is particularly significant. Between 3,000 and 13,000 Kenyans lose their lives in RTAs every year, and in 2007, it had the 10th highest death rate due to RTAs in the world (Johansson 2014) and the 5th highest in sub-Saharan Africa.

The concept of road safety strategy is the implementation of road safety measures in a systematic and comprehensive way such that resources invested can effectively be utilized to sustain and attain road safety (IRTAD, 2014). Every country around the world implements a certain amount of road safety work which essentially is a complex process involving different economical and societal elements (Sun & Lovegrove, 2008). Like many other researchers on road safety, Manyara (2013) adds that road safety strategies are plans of action to avoid road injury and death resulting from road traffic accidents. These definitions point to the fact that road safety strategy conveys a message of taking action to avoid road traffic accident.

The focus of this study is Kitale-Webuye road of Trans Nzoia County in Kenya. Kitale is one of the towns where programs on road safety awareness targeted at road users have been implemented in recent times, 2014 to 2015, particularly by one organisation called Smart Drivers Organization (SDO). Smart Drivers Organisation is a professional Non-Governmental outfit specialized in road safety projects and programs that include capacity building through training, awareness campaigns as well as research and information dissemination on road safety. It has been in

operation since 2009 and is a member of the 3-Star Coalition and the Global Alliance of NGO's for Road safety (SDO, 2014).

In compliance with Kenya's road safety regulatory body, the Kenya National Highway Authority (KeNHA), SDO inculcates and promotes safe road user practices through a number of strategies. These strategies include road safety training, distribution of Information, Education and Communication (IEC) materials and conducting road safety awareness campaigns for the public. Through its road safety programs, SDO promotes a number of good road safety practices for various categories of road users, which has recorded success stories to date, particularly among the community leaving along the Kitale-Webuye road (SDO, 2015).

This study sought to demonstrate the influence of road safety strategies on road user practices. This study focuses on the most critical road user practises: safe road crossing (for pedestrians), wearing protective clothing (for motor cyclists also known as Bodabodas), speed limiting (for matatus) and assisted road crossing (for schoolchildren). It is anticipated that evidence generated in this study can stimulate national safety supervisory bodies and organizations similar to SDO to start employing and promoting effective road safety strategies that can save many lives on the road.

Objective of the study

The general objective of the study was to establish the influence of road safety strategies on road user practices: the case of Smart Drivers Organization. The following were objectives of the study:

- To establish the influence of road safety training on road user practices
- To determine whether Information Education and Communication (IEC) materials affect road user practices
- To assess whether road safety awareness campaigns influence road user practices

RESEARCH METHODS

The research design for this study was a mix of ex-post facto research design and survey. In the context of social and economic research the phrase ex-post facto research design means 'after the fact' or 'retrospectively' and refers to those studies which investigate possible relationships by observing an existing condition and searching back in time for plausible causal factors (Kerlinger & Rint, 2004). More formerly, Cohen, Manion, & Morison (2008) defines ex-post facto as that research in which the independent variable(s) have already occurred and the researcher starts with the observation of a dependent variable. The researcher then studied the independent variable or variables in retrospect for their possible relationship to, and effects on, the dependent variable or variables (Cohen, Manion, & Morison, 2008). This study considered road safety strategies as independent variables as they have an influence on the dependent variable, road user practices.

From the forgoing, ex-post facto research was therefore suitable for this study because the SDO had already successfully implemented projects using various road safety strategies and what was being observed were practices of the beneficiaries. In terms of projects to study, SDO had a number of projects implemented in Trans Nzoia County to promote road safety especially during road rehabilitations around town (SDO, 2014). These conditions at SDO allowed for a retrospect study of the two selected projects in order to determine the influence of road safety strategies on road user practices.

Sampling Technique

This study used the sampling frame, 1600, as the number of direct beneficiaries who were reached by the project (SDO, 2015). The procedure started with stratification of communities and road users, and then followed by random sampling. According

to Mugenda and Mugenda (2003), stratified random sampling involves selecting subjects in such a way that the existing subgroups of the population is more or less reproduced in the sample. Neuman (2000) argues that, the main factors considered in determining the sample size is the need to keep it manageable enough. This would enable the researcher to derive from it detailed data at an affordable costing terms of time, finances and human resources (Mugenda and Mugenda, 2003). According to Susan, Spinks, & Canhoto, (2015) when the sample represents a significant (e.g. over 5%) proportion of the population, a finite population correction factor can be applied as in this case - were the target population was only a proportion of Eldoret town. This reduced the sample size required to a manageable size yet still representative. The formula for this was:

$$n_a = \frac{n_r}{1 + \frac{(n_r - 1)}{N}}$$

Where n_a = the adjusted sample size, n_r = the original required sample size and N = population size. The population size was taken to be 1600 while the original required sample size was 10% of the population, 160. The sample size for the quantitative survey was therefore 160.

Respondents for this study were categorised into seven groups, motor cycle riders (Bodaboda), public van crew (matatu), bicycle cyclists, PSV bus motorists, PSV passengers, private motorists, students and pedestrians. Target areas were stratified proportionately then each category of road user was drawn. For the qualitative survey, stakeholder institutions targeted in this study included local traffic police, SDO, Road Construction Companies in Eldoret and KeNHA, Table 1.

Table 1: Target sample

<i>Quantitative Survey</i>		Trans Nzoia Road Safety Awareness Project
S/n	Respondents	
1	Motor cycle riders (Bodaboda)	25
2	Public van crew (matatu)	15
3	Bicycle cyclists	15
4	PSV bus motorists	10
5	PSV passengers	20
6	Private motorists	10
7	Students	15
8	Pedestrians	50
	Total	160
<i>Qualitative survey</i>		
	Funder	1
2	Town Traffic Police	1
3	SDO	1
4	Road construction companies	1
5	KeNHA	1
6	Schools	2
7	Fleet managers (PSV owners)	2
	Total	9

Data Collection Procedure, Processing, Analysis and Presentation

For quantitative survey, one standard questionnaire was used for road users while a discussion guide was designed for the qualitative interviews. The questionnaires focused on road safety strategies and road safety practices of the two projects under investigation. For document review, a tool for content analysis was drafted which essentially was a procedure to follow when reviewing project documents. The steps in content analysis tool led to identifying and highlighting sections that answered research questions and later reviewing them.

Quantitative data was analysed using descriptive statistics including correlation analysis while qualitative data was analysed using narrative and thematic methods. This approach helped to identify information relevant to the research questions and objectives. In analyzing data qualitatively, the researcher aimed at cross

checking the road safety strategies implemented and at what time in either project and the resultant effect. It was of particular interest to compare the trends, patterns and relations of road user practices during implementation for both projects.

Content analysis is a method that permits researchers to study an observed phenomenon unobtrusively- that is, without being directly involved with people or situations (Msila & Setlhako, 2013). Documents for the SDO project were subjected to careful scrutiny to ensure authenticity and validity to establish the trustworthiness of all the data. They were analysed for their content regarding the three key road safety strategies and their influence on road user practices. Qualitative data was managed in a manner which ensured that it was broken down into discernable units to show patterns and trends (Bogdan & Biklen, 2007). The use of different sources of information in this study to assess a

particular area was important as it increased the validity of the findings. All data was treated with due circumspection, and the relevant qualifiers were applied in terms of data streams.

The use of three different sources of information to collect data about the project and later doing content analysis ensured triangulation of data to Data collected was checked for completion, coded and analysed using Statistical Package for Social Sciences (SPSS). The purpose of data analysis was to interpret and draw conclusions from the mass of collected data (McDaniel & Gates, 2004). The analysis was done using both qualitative and quantitative techniques and descriptive statistics such as mean scores and standard deviations. Other statistics such as inferential statistics were also used to interpret the data. The results of the study were presented using tables, graphs and charts for ease of understanding. This also allowed for the interpretation of the findings generated and a recommendation from the findings. The following formula was used during this process:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where Y= Road User Practices

X₁ = Road Safety Training

X₂ = IEC materials

X₃ = Road Safety Awareness Campaigns

β₀, β₁, β₂, β₃ are determinants of co-efficient and ε = Error term

DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

A total of 160 respondents, representing 100% response rate, participated in the survey and were interviewed at different sites in the target community. The highest proportion of respondents were interviewed at Kiminimi (25.2%) followed by those at Kamukuywa (21.8%) and then at Kaburengu (17.6%). The rest came from other places. When characterised by type of

increase validity and reliability of data. Triangulation is generally considered to be one of the best ways to enhance validity and reliability in qualitative research, such as ex-post facto, and can partly overcome the deficiencies associated with using one type of method (Merriam, 2008; Neuman, 2006).

road user, the highest category was the bodabodas (26.9%) followed by pedestrians (20.2%) and then by matatu crew (11.8%).

The highest proportion of respondents (35.3%) were in the age range 20-30yrs followed by those who were 30-40yrs (26.1%). Majority of respondents were males 79.0% and as regards education attainment, majority (46.2%) were high school graduates followed by primary school graduates (35.3%). Period of stay in the area of interview showed that the highest proportion, 39.5% had stayed for above 10yrs. Those who had stayed just for 6-10yrs constituted 23.5%. This translates into more than 60% of the respondents who have stayed in the area for more than 5yrs which makes their views about road safety in the area authentic. Overall, the response rates were 100% (160) for the beneficiaries, 100% (1) for the funder and 45.5% for implementers.

The period of existence of institutions that participated in the study varied from less than 10yrs to between 20-25yrs. The primary mandate of institutions ranged from purely business, consultancy and highway policy implementation and regulation. Two institutions in the survey had been in existence for a period 10-15yrs, two other institutions between 20-25yrs, one institution 10-15yrs and another less than 10yrs. This implies these institutions have valuable institutional memory, which this survey relied upon.

The implementing institution, Smart Drivers Organization (SDO), the organization contracted to develop a road-safety awareness program for the Trans Nzoia safety awareness project, is a

professional Non-Governmental outfit specialized in road safety projects and programs that include capacity building through training, awareness campaigns as well as research and dissemination on road safety issues. It has been around for 6yrs and some of its landmark contributions in Kenya include undertaking road safety training for corporate and nongovernmental organizations and developing road-safety awareness campaigns for individuals and communities through workshops, community education and social media. SDO has implemented a number road safety awareness, which have all been in Bungoma, Trans Nzoia and Kakamega counties apart from other parts of Kenya.

SDO implemented a number of road awareness projects in Trans Nzoia county in a period of 3 years since 2015. It employed a number of strategies such as road safety training, road awareness raising and use of information, education and communication materials to positively influence road safety practices of the affected communities. Trans Nzoia Kitale road safety awareness project, under this study is, but just one of the successful projects by SDO.

Road Safety Training and Road User Practices

The survey revealed that 71.4% of the respondents, attended road safety training in their communities conducted by SDO on various dates in 2015 and 2016. Overall, there were more males than females who attended the trainings.

Training meetings organised by SDO were different and tailored to interest groups. The survey revealed that 35% of the respondents attended organised trainings – training that are arranged for a specific interest group at a particular time. Another 29% reported that they attended community sensitization meeting, 19% attended road shows while others received face-to-face talks and got brochures and fliers on road safety. There were a wide variety of topics discussed in the road safety trainings catering for various road users. The topics as seen from various reports from SDO include crossing roads at pedestrian crossings, wearing seat belts when in a moving vehicle and wearing of protective and reflective clothing when riding a motor bike. To ascertain success of the road safety trainings attended, respondents were asked to rate various aspects of the training, Table 2.

Table 2: Respondents rating of various road safety-training aspects

S/n	Road safety attribute	Don't agree (1) to I strongly agree (5)*				
		1	2	3	4	5
1.	There are road safety training activities taking place in my area	10%	4%	4%	9%	45%
2.	The topics covered at the training were relevant and useful	5%	3%	3%	10%	50%
3.	The training was attended by people in the same business as mine	9%	3%	3%	7%	49%
4.	The trainings on road safety are done regularly in my area	13%	4%	3%	3%	47%

*Doesn't include non-response percentages**

All aspects of the road safety training assessed were rated highly with 60% of the respondents agreeing that topics covered in the training were relevant and useful. Generally, respondents agreed that there are road safety training activities taking place in their area (54%) and are

done regularly, while 55% confirmed the training was attended by people in the same business – training was tailored towards a specific business group at any given time. These findings on road safety training confirms that indeed SDO conducted training for the community were topics

covered were found to be relevant and useful. Owing to the fact that SDO used skilled project staff to conduct tailor-made training as observed by (Manyara, 2013), the possibility that road users have retained this knowledge are quite high and has an impact on their attitudes and road user practices.

Road Safety Information Education Communication and Road User Practices

Almost in all their road safety awareness activities SDO distributed information education

communication (IEC) materials on road safety to their audiences. These ranged from caps, T-shirts, fliers, brochures and at times mounted poster and erected billboards. The survey revealed that 76.5% of the respondents received road safety IEC materials on road safety. Again, majority of these were males. Various aspects of road safety IEC materials were rated by respondents as in Table 3.

Table 3: Respondents rating of various road safety IEC aspects

S/n	Road safety attribute	Don't agree (1) to I strongly agree (5)*				
		1	2	3	4	5
1.	The written materials provided clear messages that I read and understood	5%	2%	3%	7%	59%
2.	I found the materials informative and educative	4%	2%	3%	9%	58%
3.	I have helped others understand road safety through the training received	3%	3%	5%	11%	55%
4.	The pictures and visual aids passed clear messages	1%	2%	1%	11%	61%

*Doesn't include non-response percentages**

The ratings of various aspects of road safety IEC materials distributed by SDO shows overwhelming satisfaction by respondents. For example, 72% of the respondents who received road safety materials reported that pictures and visual aids passed clear messages regarding road safety. Others added that even the written materials also provided a clear message that was understandable. Another 66% of the respondents agreed that after using IEC materials they were able to help others understand road safety. Overall 65% of the respondents said the IEC materials found the materials informative and educative.

Findings on these road safety IEC materials confirms literature referenced here that indeed, IEC materials are a formidable road safety awareness strategy to reach out to many people with long lasting impacting messages. As

observed by Tingvall (2009), IEC materials not only enables road users to get informed and be able to communicate in a simple and clear way, but also provides an opportunity to deal with feelings and allows individuals to make informed decisions about their situation. IEC materials can also provide security, identity and signs of hope especially when they are retained in form of brochures, fliers, caps, T-shirts etc. More than 60% of the respondents reported that they have even managed to help others understand road safety through the IEC they received

Road Safety Awareness Campaigns and Road User Practices

Road safety awareness campaigns were the main strategy by SDO to reach out to a lot of people at time and were normally held in densely populated communities. The survey revealed that 80%

attended road safety awareness campaigns held at different times in their communities. Table 4

shows how respondents rated various aspects of the road safety awareness campaigns:

Table 4: Respondents rating of road safety awareness campaigns

S/n	Road safety attribute	Don't agree (1) to I strongly agree (5)*				
		1	2	3	4	5
1.	I found the awareness campaigns helpful because they were done in appropriate settings	5%	2%	7%	14%	51%
2.	The campaigns were adequate, frequent and meaningful	4%	8%	5%	8%	53%
3.	I still remember the contents of the campaign programs	3%	5%	5%	9%	56%
4.	The campaign sessions were well attended within my area	4%	4%	7%	8%	56%

*Doesn't include non-response percentages**

Like the rating for the foregoing two road safety strategies, ratings for road safety awareness campaigns was equally good. More than half of the respondents (65%) reported that they still remember contents of the campaign programs implying these meetings were interesting and had something to learn. About 61% said the campaigns were adequate, frequent and meaningful, another 65% found the awareness campaigns helpful because they were done in appropriate settings. Generally, most respondents said the campaigns sessions were well attended within their areas.

The fact that more than 60% of the respondents still remember the contents of the campaign programs confirms the observation held by WHO: "...road safety campaigns are defined as purposeful attempts to inform, persuade, and motivate a population (or sub-group of a population) to change its attitudes and/or

behaviours to improve road safety, using organised communications involving specific media channels within a given time period" (WHO, 2015). The findings on public campaigns as a road safety awareness strategy holds the promise of reaching out to masses with persuasive information of changing road user practices.

Respondents' Perception on Road User Practices

Various road user practices, which ultimately determine road safety for users are promoted by SDO in its activities. In its messaging, never takes it for granted that communities already know what is expected but of road users but goes all the way to explain the implications of such practices even other road users. To this end, this survey assessed how much of these best practices are frequently used by the communities where SDO carried out awareness campaigns, giving out results show in Table 5.

Table 5: Best Road User Practices Exercised by Respondents

S/n	Road safety attribute	Don't agree (1) to I strongly agree (5)*				
		1	2	3	4	5
<i>Motorists & motorcyclists</i>						
1.	I always wear seatbelts while in a vehicle	13%	6%	4%	5%	53%
2.	I check my vehicle for fitness before I start driving	8%	5%	3%	4%	60%
3.	I am aware of all road signs and observe them all the time	2%	3%	3%	61%	77%

S/n	Road safety attribute	Don't agree (1) to I strongly agree (5)*				
		1	2	3	4	5
4.	I observe speed limits at all times	3%	3%	4%	5%	62%
5.	I overload my vehicle as long as I can get away with it	47%	3%	6%	5%	16%
6.	I use protective/reflective gear when using a motorcycle or a bicycle on the road	12%	6%	3%	4%	60%
<i>Pedestrians & cyclists</i>						
7.	I only use pedestrian crossing while on foot	18%	7%	5%	13%	40%
8.	I use walkways and pavements whenever I am along a tarmacked road	8%	5%	5%	9%	54%
9.	I use cycle paths where such exist	8%	5%	5%	8%	54%

*Doesn't include non-response percentages**

Interestingly, findings on best user practices showed (Table 5) that for motorists, overloading was a risky behaviour and practice that was rare based on self-reporting (21%). By implication this may mean motorists are aware that overloading is bad and is a road traffic offence or could be that it's a practice which is rare. The same can be said on over speeding were 67% of the motorists say they rarely break speed limits.

The rest of the road user practices assessed in this study show that 58% of the motorists reported as always wearing seatbelts while in a vehicle and 64% checking their vehicles for fitness before starting off. Motorists who are aware of all road signs and observe them all the time were 77%. These proportions are impressive as they show that a bigger effort by the community in general has been made. But considering that its loss of lives involved at any time when these are broken, these proportions are not good enough. As is the case for any effective impact to be made in behaviour change in a community, there is need to raise these proportions to 80%!

On pedestrians, it was learnt that the road network in communities is not yet completely modernised and therefore road accessories such as walkways and cycle paths are not as common. A few pedestrians who have accessed such

facilities said that they use them when they find them. For example, only 40% of the pedestrian strongly agree that they cross roads on pedestrian crossing when available

Correlation Analysis between Road Safety Strategies and Road User Practices

To further determine the influence of road safety strategies on road user practices statistically, the relationship that exists between these two variables was statistically assessed using correlation analysis. A correlation analysis is measured by the coefficient of correlation or coefficient of determination (r^2), an index that shows both the direction and the strength of relationships among variables, taking into account the entire range of these variables. The sign (+ or -) of the coefficient indicates the direction of the relationship. If the coefficient has a positive sign, it means there is correlation, when one variable increases, the other also increases and the converse is true. To compute correlation between the study variables and their findings, Spearman Coefficient of Correlation at 95 percent confidence interval was used. Computation results showed positive correlation between road safety training and road user practices with a correlation coefficient of 0.697. Road safety IEC materials and road safety awareness campaigns

also showed positive correlation with road user practices of 0.745 and 0.473 respectively.

Positive relationship indicates that there is a correlation between the road safety strategies and road user practices. The significant values for the relationship between the road user training; road safety IEC materials and road user awareness campaigns were 0.034, 0.025 and 0.301 respectively. Thus at 5% confidence level and at p-value ($P < 0.05$), only road user training and road safety IEC materials were significantly correlated to road user practices. From this, it can be deduced that with road safety IEC Materials in place and road user training conducted, road user practices can be positively influenced significantly.

CONCLUSIONS AND RECOMMENDATIONS

It has been seen in this study that road safety strategies have a direct influence on road user practices in that road user training, distribution of IEC materials and awareness campaigns all carry messages targeted at changing the road user mindset and thus behaviour. The messages so given to the road users are meant to be something to reflect upon and make informed decisions in one's interest and the interest of the wider community.

From the findings of this study, it can be concluded that road safety strategies either implemented alone or as a package, can positively influence road safety behaviours. The study has shown that the strategies that have been reviewed all carry messages that appeal to individuals and communities to take action when they consider consequences of not doing so. What stands out prominently is that these road safety strategies work well for different groups of people under different environments. For example, motorists who may not have had time to go for refresher driving courses can make the most out of road safety training in that this is the time they can raise questions on latest developments in road safety and equally learn and get latest tips

trending in road safety. Road safety awareness training has other intrinsic benefits such as team building and opportunities to refine strategies on the part of trainers.

The other mode of road safety information delivery, reviewed in this study is the distribution of IEC materials. As was done by SDO, IEC materials were mainly distributed after a road safety discussion with deserving targeted community members, which was mainly at mass rally or campaigns targeted to reach many people at once. It was noted from the rating of the materials by respondents that they were well received and were found to be very useful and relevant. It can be concluded that campaigns are an effective way of reaching out to many provided materials in use are appropriate for the audience. It was observed also in the study that IEC materials were durable and last long and there saved as reference materials way after the exercise is over.

Based on the findings of the study, recommendations have been formulated which if implemented would further enhance the influence of road safety strategies on road user practices. The findings that road safety IEC materials have the highest correlation with road user practices, well thought out IEC should be produced if they should have a desired impact. Findings also show that road safety awareness training on one-on-one interaction, cements an understanding of the purpose of road safety. This study therefore recommends road safety training as a must for influencing road safety practices. Further, as revealed by this study, looking at how critical campaigns are in reaching out to many individuals at once in influencing road user practices, the study recommends that campaigns should be considered for quick and effective transmission of messages to the community.

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