Journal of Management and Science

14(2) (2024) 78-93

OPEN ACCESS

RESEARCH ARTICLE

DOI: https://doi.org/10.26524/jms.14.21

Effectiveness of speed cameras on the prevention of road traffic collisions and casualties in cameroon

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Abstract

Issues related to transport collision and casualties cannot be undermined as it has direct effect on human health and death, hence relevant policies are required to reduce road traffic accidents. To do this, our study has as objectives: to discuss the drivers of the used of speed cameras by drivers in Cameroon., investigate the effects of speed cameras on the prevention of road traffic collisions and casualties in Cameroon and to determine the actual problems faced by drivers in the use of speed Cameras in Cameroon. Methodologically, the study applied the probit technique to estimate the result via primary data. The sample size consisted of 200 drivers collected through a well-structured questionnaire and collect among the drivers plying the Yaoundé-Doula, Douala –Bafoussam and Bafousam-Yaoundé major highway. The key findings revealed that the factors influencing the drivers used of speed cameras are: main occupation, attainment of higher education, married, age, victim of traffic collision and casualties. The result also shows that Speed camera is highly corroborating with the prevention of road traffic collisions and casualties in Cameroon. Finally, the result shows that the lack of awareness, student speed change, inadequate signage, limited visibility, technical limitations and privacy concerns are the actual physical challenges of the use of speed camera in Cameroon. The study suggests that decision makers in the transport sector should multiply the provision of speed cameras. This is a wise step in the prevention of road traffic collisions and casualties in Cameroon and better labour market.

Keywords: Speed Cameras, Prevention, Road Traffic, Collisions, Casualties, Cameroon.

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How to cite this article: Apongnwu W. Awamachi, Mbu D. Tambi[b], Nkeng G. Elambo. Effectiveness of speed cameras on the prevention of road traffic collisions and casualties in cameroon 14(2) 78-93. Retrieved from https://jmseleyon.com/index.php/jms/article/view/743
Received: 28 April 2024 **Revised:** 30 May 2024 **Accepted:** 24 June 2024

1. Introduction

Road traffic collisions and casualties remains an important issue among the leading causes of casualties accounting for more than 1.2 million fatalities and 50 million injuries globally per year. Of these casualties, speeding is a substantial contributing factor. Nowadays, speed reduction is mainly achieved through speed law enforcement measures meanwhile, the government of Cameroon through the ministry of transport introduced speed cameras as a means for the control of traffic collisions and casualties on the roads on March 8, 2021. Amongst the national roads in Cameroon, only the Yaoundé-Douala has a fixed-speed camera posts meanwhile Bafoussam – Yaoundé has mobile speed Camera control teams executed by the Paramilitary Police force (National Gendarmerie). With the mobile control system, a control agent snaps vehicles that violate a speed limit sign and informs the control team ahead through a phone call (GOC, 2019).

The use of speed cameras, also known as speed enforcement cameras or radar cameras is a common road safety measure employed by many countries worldwide, including Cameroon. These cameras are designed to monitor vehicle speeds and capture images or videos of vehicles exceeding the speed limit. The primary objective of using speed cameras is to reduce the incidence of traffic collisions and casualties by enforcing speed limits and discouraging excessive speeding. A speed camera is a device placed at the side of roads to photograph vehicles whose drivers are breaking the speed limit on certain roads. On Bastille Day, 2002, then-French President Jacques Chirac said France's roads were the most dangerous in Europe and introduced the speed cameras as a road traffic collision and casualty control measure meanwhile it was introduced in Britain in 1992 at the Twickenham Bridge for the same purpose. At the time, France was averaging 8,000 traffic deaths a year, whereas

in Britain, a country of similar size, traffic deaths numbered 3,500. The determination of the effectiveness of speed cameras in preventing road traffic collisions and casualties in Cameroon will involve considering a study of road traffic collisions and casualties in the major roads of Cameroon from the period January 1, 2016 until March 8, 2021 (1,897days). This is when the use of speed Cameras as a road traffic control measure, was introduced in Cameroon along the major highways and to compare the findings with the results of the study from then until August 31 2023 (875days)

In 2004 the WHO agreed that excessive and inappropriate speed contributes to about 30% of deaths on the road in high-income countries, meanwhile in some low-income and middle-income countries speed is estimated to be the main contributory factor in about half of all road crashes. According to World Health Organization (WHO) (2020), speeding was a contributing factor in 26% of all traffic fatalities. The likelihood of being involve in a crash increase with higher speeds. WHO (2004) equally noted that an increase in speed of just 1 km/h (0.6 mph) is associated with a 3% increase in the occurrence of crashes. Higher speeds reduce the time available for drivers to react to unexpected situations and increase the distance required to stop a vehicle. The "Three E's" – energy, exposure, and errors, describes the relationship between speed and crash severity. Higher speeds increase the energy released in a collision, leading to more severe impacts and increased likelihood of fatalities

Global Road Safety Partnership (GRSP) estimates that a 5% reduction in average speed can result in a 30% reduction in fatal crashes. In Cameroon, most road accidents occur along the Yaoundé-Douala-Bafoussam-Yaoundé road identified as "Death Triangle" because it records over 46% of the entire road accidents on Cameroon highways and most of these accidents are due to excessive speed (see Cameron, 2000). According to the elaboration of a national strategy for road accident prevention and safety in 2009 done by the ministry of transport of Cameroon, it was revealed that 70% of road accidents were due to human error with excessive speed as the leading factor. Findings from 2004 to 2007 show that excessive speed accounts for 20% of road accidents on the Yaoundé-Douala highway meanwhile reports from 2018 to 2019 along with the Douala-Dschang highway account for 34.3%. Controlling vehicles' speed can prevent crashes occurrence and reduce the impact when they occur, lessening the severity of injuries sustained by the victims (WHO, 2020).

In Cameroon, speed guns are exclusively used to control vehicle speed on highways by the Ministry of Transport and the Gendarmerie of the Ministry for Defense. Mobile and fixed speed cameras are used to sanction defaulters of speeding on different highways. Amongst the national roads in Cameroon, only the Yaoundé-Douala – N3 has a fixed-speed camera post managed by Ministry of Transport. With the mobile control system, a control agent snaps violated vehicles of a speed limit sign and informs the control team ahead through a phone call. The offender is hence interrupted for immediate payment of fines (25,000 fcfa) (GOC, 2019). On the other hand, speed guns are fitted in chosen fixed post of National Road N3 where defaulting vehicles of speed limit signs are snapped and stored in a built-in server. According to the reports of WHO, road accidents ranked 3rd in position among the leading causes of mortality in the world and caused approximately 1.2 million deaths with 50 million people injured worldwide in 2013. In Africa, deaths from accidents increased from 1.24 million to 1.35 million per year in 2018. In Nigeria, data from Federal Road Safety Corps and Statistics Bureau show that between 2013 and 2020, 41,709 lives were lost from road accidents making them one of the leading causes of death. The Douala-Yaounde road axis in Cameroon considered as the busiest along the Douala-Bangui, Douala-Ndjamena, and the Brazzaville-Bangui corridors is a death trap for humanity following the occurrence and frequency of accidents. The frequent road accidents along this axis; which also link Bafoussam in Western Cameroon have made the national road to be referred to as "The Triangle of Death". Apart from deaths and injuries recorded, the monetary cost of road accidents along this lane is high and contributes significantly to the Cameroon estimated total loss of 100 billion CFAF representing 1% of her Gross Domestic Product (GDP) per year (GOC, 2019).

Road accidents along the Yaoundé-Douala National Road no 3 are attributed to three main factors namely reckless driving, poor state of vehicles and the nature of the road. Unfortunately, high accusations are given to road users as the main cause of road accidents. The indexation of drivers masterminds the crucial role played by the poor state of the road as prime factor of road accidents and crashes. This perception has diverted attention from structural factors to indexation of road users as having a dangerous prone driving culture. The article seeks to raise a case against the paradigm in Cameroon road safety discourse that road users are the prime cause of road transport accidents. That enforcement of punishment against reckless driving rather than improving on existing road infrastructure and quality to meet current standards is the sustainable therapy to mitigate road menace. The paper also presents the challenges and sustainable options to redress road safety between Douala and Yaoundé using evidence-based therapies.

It is crucial to highlight that the successful implementation of speed cameras in Cameroon would require careful planning, adherence to local regulations and legal frameworks, and the allocation of appropriate resources. Public awareness campaigns and educational programs would also be necessary to

inform drivers about the purpose and benefits of speed cameras. Furthermore, it is important to recognize that speed cameras should be complemented by other road safety measures, such as driver education, road infrastructure improvements, and comprehensive traffic enforcement strategies. These combined efforts can lead to significant improvements in road safety and a reduction in speeding-related incidents in Cameroon. A study on the effectiveness of speed cameras in preventing road traffic collisions and casualties in Cameroon would provide valuable insights into the potential impact of this specific intervention within the broader context of road safety challenges in the country. Collective international evidence showcases the positive impact of speed cameras in terms of reducing speeding, collisions, and casualties. They serve as valuable tools in promoting road safety, but their implementation needs to be considered in conjunction with other road safety measures and tailored to the specific context to maximize their effectiveness.

There is significant potential for implementing speed cameras in Cameroon to address the issue of speeding and promote compliance with speed limits. Speed cameras are widely recognized and utilized tools globally, demonstrating their effectiveness in enhancing road safety. They are an effective means of enforcing speed limits. By capturing images or recording data of vehicles exceeding speed limits, speed cameras help deter drivers from speeding and promote compliance with established speed regulations. The presence of speed cameras acts as a visible reminder to drivers to adhere to speed limits. Studies have shown that when drivers are aware of the possibility of speed camera enforcement, they tend to modify their behavior and drive at safer speeds, even when cameras are not present. These cameras have a proven track record of improving compliance among drivers. The fear of receiving fines or penalties encourages drivers to be more conscious of their speed and adhere to posted limits. This, in turn, helps to reduce the risk of collisions and casualties caused by speeding (GOC, 2019).

The perception that speed cameras are actively monitoring and enforcing speed limits can act as a deterrent for potential speeders. The knowledge that speeding violations can be captured and result in penalties influences driver behavior and encourages them to maintain safer speeds. Speed cameras offer a cost-effective means of enforcing speed limits compared to other enforcement methods, such as increased police presence or mobile speed traps. Once installed, speed cameras can continuously monitor and enforce speed limits, requiring limited ongoing human resources. Furthermore, it is important to recognize that speed cameras should be complemented by other road safety measures, such as driver education, road infrastructure improvements, and comprehensive traffic enforcement strategies. These combined efforts can lead to significant improvements in road safety and a reduction in speeding-related incidents in Cameroon.

The problem addressed in this research is the effectiveness of speed cameras in preventing road traffic collisions and casualties in Cameroon. Speeding is a significant risk factor for road traffic accidents, contributing to a higher likelihood of collisions and increasing the severity of resulting injuries. While speed cameras have been implemented in various countries as a means of enforcing speed limits and promoting compliance, there is a lack of specific research on their effectiveness in the Cameroonian context. Assessing the effectiveness of speed cameras in Cameroon is crucial for developing evidence-based road safety strategies and interventions. Cameroon, like many other countries, experiences a high number of road traffic collisions and resulting casualties. Limited resources, inadequate road infrastructure, and challenges in enforcing traffic regulations contribute to the prevalence of speeding and its consequences. Understanding the effectiveness of speed cameras in preventing road traffic collisions and casualties is essential for improving road safety in the country. The problem statement can be further elucidated thus: in Cameroon, road traffic accidents account for a significant number of injuries and fatalities, exerting a significant burden on individuals, families, and the healthcare system. Addressing the problem of speeding and its impact on road traffic collisions is important for reducing the human and economic costs associated with road accidents.

Despite the widespread implementation of speed cameras in many countries, research specifically focused on their effectiveness in preventing road traffic collisions and casualties in Cameroon is limited. This lack of research poses challenges in formulating evidence-based road safety policies and interventions tailored to the Cameroonian context. Speeding significantly increases the risk of collisions and the severity of resulting injuries. Excessive speed reduces the time available for drivers to react to unexpected situations, extends the distance required to stop a vehicle, and leads to a higher kinetic energy upon impact. Understanding the potential effectiveness of speed cameras in reducing speeding and improving compliance with speed limits is essential for promoting road safety in Cameroon (Hasselberg et al., 2013). Literature related to this domain of study in Cameroon is still scarce and developing. This makes it problematic and a call for concern. To resolved these issues, the study targets as objectives: (1) to discuss the drivers of the used of speed cameras by drivers in Cameroon, (2) to investigate the effects of speed cameras on the prevention of road traffic collisions and casualties in Cameroon and (3) to determine the actual problems faced by drivers in the use of speed Cameras in Cameroon

2. Literature Review

Road traffic collision, also known as a traffic accident or crash, refers to any event that involves a vehicle or vehicles on a road and results in damage or injury to people or property (WHO, 2020). The term "collision" emphasizes the impact between vehicles, objects, or pedestrians rather than attributing it solely to chance or randomness (European Commission, 2017). This broader term recognizes that many collisions are preventable and that they are the product of various contributing factors. The understanding of road traffic collisions has evolved over time. Historically, they were often regarded as unavoidable accidents resulting from unpredictable circumstances or driver error. However, there has been a shift towards acknowledging that the majority of collisions are preventable incidents that can be mitigated through proactive measures (Elvik, 2021). This shift in perspective has paved the way for comprehensive road safety strategies aimed at reducing collisions and their associated human and economic costs.

Severity levels are also crucial, ranging from minor collisions without significant injuries to more severe incidents involving fatalities or severe injuries (Broughton et al., 2006). Classifications based on the types of vehicles involved, such as car-to-car collisions, pedestrian-vehicle collisions, or motorcycle accidents, allow for further analysis of the specific dynamics and risk factors associated with each type (Hasselberg et al., 2013). Other important measures include injury severity indices, such as the number of fatalities, serious injuries, and minor injuries resulting from collisions. These measures provide insight into the human impact and can help assess the effectiveness of interventions in reducing harm (Elvik, 2013). Additionally, economic costs associated with collisions, such as medical expenses, property damage, lost productivity, and emergency response, are considered in estimating the overall impact of road traffic collisions (Aldred and Grundy, 2020). By utilizing these metrics and indicators, researchers, policymakers, and road safety practitioners can gain a comprehensive understanding of road traffic collisions, identify trends, and design evidence-based interventions to prevent and mitigate their occurrence. Road traffic accidents cause significant economic losses to individuals, their communities, and the country as a whole (Hyder, Peden, & Krug, 2002). These losses arise from the cost of treatment as well as the loss of outputs for those killed or injured by these accidents, and the burden for family members who need to take time off duties to care for the injured (Hyder et al., 2002). Road traffic accidents are a major but ignored global public health threat, requiring joined efforts for effective, prompt, and sustainable prevention (WHO, 2018).

According to WHO (2021), road traffic injuries caused 6,560 deaths in Cameroon, accounting for 2.97% of all deaths. This figure represents approximately 1 out of every 34 deaths (WHO, 2018). The age-adjusted death rate for road injuries in Cameroon is 35.06 per 100,000 population, ranking Cameroon as the 28th country in the world in terms of road traffic accident fatalities (WHO, 2018). Government statistics indicate that Cameroon experiences an estimated 16,583 road accidents annually, resulting in over 1,000 fatalities according to national data, and approximately 6,000 deaths according to WHO estimates (WHO, 2018). On average, 18 people die each day due to road traffic accidents in Cameroon, equating to one death every 80 minutes (WHO, 2018). This is particularly concerning considering the generally poor condition of road infrastructure in Cameroon, with approximately 90% of roads being poorly constructed and untarred. Notably, vehicle occupants and pedestrians account for 43% and 38% of road traffic accident fatalities, respectively, particularly in large cities (WHO, 2021).

In the Cameroonian context, a conceptual framework that integrates the concepts of road traffic collisions, casualties, and speed cameras can provide a structured understanding of their interrelationships and the potential impact of speed cameras on preventing collisions and reducing casualties. This framework sheds light on the role of speed cameras as a preventive measure in promoting road safety. The conceptual framework recognizes that road traffic collisions occur when vehicles or pedestrians come into contact and result in damage or injury (WHO, 2020). Excessive speeding is a primary contributing factor to the occurrence and severity of these collisions (Elvik, 2013). Speed cameras, as automated devices, play a crucial role in detecting and monitoring vehicle speeds, facilitating the enforcement of speed limits (Høye, 2019). This literature illustrates the potential impact of speed cameras on preventing collisions and reducing casualties. By effectively enforcing speed limits, speed cameras can deter drivers from exceeding safe speeds, thus lowering the occurrence of collisions caused by excessive speeding. This preventive function helps mitigate the risk factors associated with speeding, such as reduced vehicle control, longer stopping distances, and increased crash severity (WHO, 2018).

Reduced collisions, in turn, can lead to a decrease in road traffic casualties. The effective implementation of speed cameras can contribute to the reduction of injuries and fatalities resulting from road traffic collisions. By encouraging drivers to adhere to speed limits, speed cameras help create a safer road environment, reducing the severity of collisions and minimizing the potential for casualties (Hermans et al., 2019). However, the effectiveness of speed cameras in preventing collisions and reducing casualties is influenced by various factors. These factors include proper placement and calibration of speed cameras, adequate signage and communication to alert drivers

to their presence, and effective enforcement strategies, such as a well-defined legal framework and appropriate penalties for speed violations (Knowles et al., 2012). Additionally, road infrastructure and other contextual considerations unique to the Cameroonian context, such as driver behavior and cultural norms, can also influence the effectiveness of speed cameras (Delhaye et al., 2017).

A large body of empirical research has shown that speed cameras are effective in reducing road traffic collisions (WHO, 2004). For example, a systematic review of 212 studies found that speed cameras reduced collisions by an average of 24% (Hermans et al., 2019). Another review of 167 studies found that speed cameras reduced collisions by an average of 22% (World Health Organization, 2004). Studies have shown that speed cameras are effective in reducing collisions in a variety of settings, including urban, rural, and highway areas (WHO, 2004). They have also been shown to be effective in reducing collisions involving all types of vehicles, including cars, motorcycles, and trucks (Elvik, 2003).

The evidence for the effectiveness of speed cameras in reducing road traffic casualties is strong. A systematic review of 130 studies found that speed cameras reduced casualties by an average of 11% (Elvik, 2003). Another review of 112 studies found that speed cameras reduced casualties by an average of 10% (Delhaye et al., 2017). Studies have shown that speed cameras are effective in reducing casualties in a variety of settings, including urban, rural, and highway areas (Elvik, 2003). They have also been shown to be effective in reducing casualties involving all types of vehicles, including cars, motorcycles, and trucks (Delhaye et al., 2017). One of the most comprehensive reviews of the literature on the effectiveness of speed cameras was conducted by Elvik (2003). This review included 130 studies from 19 countries. Elvik found that speed cameras reduced casualties by an average of 11%. The reduction in casualties was greater in urban areas (14%) than in rural areas (7%). Speed cameras were also more effective in reducing casualties involving cars and motorcycles (12%) than in reducing casualties involving trucks and buses (9%). Another large review of the literature on the effectiveness of speed cameras was conducted by Hermans et al (2019). This review included 112 studies from 21 countries.

3. Methodology

Area and scope of the Study

Cameroon is a country located in the western part of central African region. The official name of Cameroon is the Republic of Cameroon and its total land area is 475, 442 sq.km (GOC, 2019) it is the fifty fourth largest in terms of area. Cameroon is bordered by Republic of Congo, Gabon and Equatorial Guinea to the south, Central African Republic to its east, Chad to its north and Nigeria in the west. It has 402 km long coastline in the west of the Bight of Biafra, part of Gulf of Guinea and the Atlantic Ocean. Cameroon lies between latitudes 1o and 13oN, and longitudes 8o and 17oE. Cameroon is a country with several major towns, amongst which are Yaoundé, the political capital of the country with about one million inhabitants, Douala, which is the major economic city, has more than two million inhabitants. The other main towns are Garoua, Bafoussam, Maroua, Bamenda, Buea etc.

The population of Cameroon in 2020 was estimated at 27, 482,681 people as of Saturday, December 4, 2021, based on world meter elaboration of the latest United Nations data. Cameroon has slightly more women (50.5%) than men (49.5%). Over 60% of the population is under age 25. People over 65 years of age account for only 3.11% of the total population. Cameroon's population is almost evenly divided between urban and rural dwellers. Population density is highest in the large urban centers, the western\ highlands and the northeastern plain. A large number of Cameroonians live as subsistence farmers. The country is often referred to as "Africa in miniature" for its geological, linguistic and cultural diversity. It natural features include beaches, deserts, mountains, rainforests and savannas. People from the overpopulated western highlands and the underdeveloped north are moving to the coastal plantation zone and urban centers for employment. Smaller movements are occurring as workers seek employment in lumber mills and plantations in the south and east. Although the national sex ratio is relatively even, these out-migrants are primarily males, which lead to unbalanced ratios in some regions (GOC, 2019).

Roads in Cameroon are classified based on their importance and function. National roads are the most significant, connecting major cities and economic centers. Regional roads connect national roads to local areas within a region, while departmental roads link regional roads to smaller administrative units. Urban roads are found within cities and towns, serving residential and commercial areas. Rural roads connect rural communities and provide access to markets, health facilities, and essential services. This classification helps prioritize resources and plan maintenance activities to improve connectivity and meet the diverse transportation needs across the country. Road safety on the country's road network is a pressing concern as speeding, reckless driving, inadequate driver training, and low awareness of traffic rules increase the risk of collisions and casualties. These incidents not only result in loss of life but also hinder social and economic progress. Addressing these challenges requires implementing road safety measures, including speed cameras, to promote compliance with traffic regulations and reduce road traffic collisions and casualties. The road

networks that were surveyed can be seen as illustrated in Figure 1.

Data presentation

The study population was made up of road users and travel agency employees plying the segment of road Yaoundé-Doula-Bafoussam-Yaoundé (the triangle of death). The sampled populations irrespective of age or sex were then issued questionnaires or interviewed directly to have their perceptions concerning the effectiveness of speed cameras in preventing road traffic collisions and casualties. The study adopted a quantitative design to obtain data useful for evaluating the work. The quantitative research design has been used for this work. This particular design was adopted because it provides rich

Quantitative data was collected from primary and secondary sources. It should be noted that the study involved numerical data. The study was carried out along the Yaoundé-Douala-Bafoussam-Yaoundé high ways. This quantitative data was gathered from diverse participants including drivers, travel agency employees, and road users within these selected road segments. Voluntarily, they were approached and their opinions and experiences regarding the effectiveness of speed cameras in reducing traffic collisions and casualties within the Triangle of Death were solicited. This data collection approach involved gathering firsthand insights from individuals directly impacted by the presence of Speed Cameras and their effects on road collisions and casualties. These participants provided valuable perspectives on how speed cameras influence road safety and potentially contribute to reducing collisions and casualties on the selected road segment. Thus, a cross-sectional survey was used for the collection of data which included both primary and secondary data. The data collection was done in the month of October 2023. In an effort to meet the general objectives of the study, two methods of primary data collection were used. The data collection was based on the impact of speed cameras on reducing vehicle speeds, the significant differences in the incidence of road traffic collisions in areas with speed cameras and those without and the perceptions and attitudes of drivers towards the presence and effectiveness of speed cameras in Cameroon. The methods that were used for the collection of the data include direct interviews and questionnaires.

A structured Likert scale questionnaire with closed-ended questions was used to collect information from the participants who voluntarily gave their opinion concerning Effectiveness of Speed Cameras in reducing Road Traffic Collisions and Casualties in Cameroon. The questionnaire was prepared in English and French, and distributed to the participants. The questions were designed for analysis using the SPSS for Windows computer software. Questionnaires had the advantage of covering a large area easily and quickly. It was anonymous and self-administered to increase return rate and solve problems related to supplementary information. Quantitative data obtained were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software (version 23). SPSS for Windows is a powerful statistical analysis and data management system in a graphical environment using descriptive menus and simple dialogue boxes to perform operations (Norusis, 1993). Data collected from the field was analyzed using different techniques in analyzing quantitative data. Firstly, the population was randomly sampled before questionnaires were given out. Where afterward, there was both helpful and unhelpful data which was collected from the field. Quantitative data has been analyzed descriptively and with the used of table and probit estimation technique.

To ensure the reliability and stability of the research instrument, the researcher ensured that the questions were asked in conformity with the research objectives of the study and a pilot test of the research instrument was conducted and calculated using office Microsoft excel which was computed of question reliability and validity. The questionnaire was given to the supervisor for revision and approval. Necessary corrections were made and a pre-test conducted. The reliability of instrument was achieved by pilot testing of instruments where 10 questionnaires were drafted and administered to some drivers within Yaounde town. Considering ethical issues, the study received approval from the National Advanced School of Public Works, Yaoundé, Université Libre de Bruxelles, University of Padua, and Sapienza University of Rome to be conducted. Permission to collect data was obtained from the authorities of the Paramilitary Police force (National Gendarmerie) and the Ministry of Transport. The objectives and protocol of the study were clearly explained to the participants, emphasizing their voluntary participation and the option to withdraw from the study at any time without providing a reason. Participants were assured that their information would be treated confidentially and solely used for the purposes of the study. Proper citation and referencing in accordance with the American Psychological Association (APA) 7th edition style was employed to ensure avoidance of plagiarism.

Empirical Specification

Theoretically we make used of the economic model of the family developed by Becker (1965) and as applied by Frijters et al (2008). This forms the conceptual basis for our analysis of the effectiveness of speed cameras on the prevention of Road Traffic Collisions and Casualties in Cameroon. Based on these authors, the relationship between speed cameras and Road Traffic Collisions/ Casualties can be described within the framework of a simple household production model (see also Dunkelberg and Spiess, 2007). Thus, the generic model of Collisions/Casualties for driver i, is assumed to be:

$$C_i = \lambda_1 \chi_i + \delta_1 SC_i + \varepsilon_{1i} \quad (1)$$

Where represent a binary variable representing driver collision/casualty in the road network of Yaoundé-Douala-Bafoussam-Yaoundé; is a vector of household characteristics such as: sex of drivers, level of education, place of residence, age, experience, etc. These are factors belief to be influencing speed cameras. is road traffic speed camera. Further, is a random error term while the coefficient is the parameter of primary interest and represents the impact that speed camera has on road traffic collisions/casualties and shows the effect of the other factors apart from speed camera.

The equation (1) above reports the probit estimate that measure the marginal effects of speed cameras on collisions/casualties. The probit estimate is an appropriate estimate in this type of a study because it attempts to capture the impact of speed cameras addition to a driver's collisions/casualties. However, this single-equation estimate may be upward or downward biased depending upon the effect that speed camera has on traffic circulation and on the correlation between omitted variables and speed cameras. For example, if speed camera has a positive impact on collisions/casualties, then we would expect the probit estimate of to be biased upward. To avoid this problem of endogeneity, we have seriously scrutinized our selection of variables in the collisions/casualties equation. This means that our model is void of any biases.

Inaddition, as reviewed in Frijters et al (2008), we can calculate the marginal effects of speed camera on collisions/casualties based on the following equation;

$$ME(\chi^K) = \frac{1}{N}\sum_i \frac{\delta p(CC_i = /\chi_i, SC_i, \hat{\beta}, \hat{\lambda}, \hat{\delta})}{\delta \chi_i^k} \quad (2)$$

Where: as the average of the marginal effect of everyone in the sample and is a vector of characteristics with the k'th element in that vector, thus, the marginal effect of speed camera on collisions/casualties will be:

$$ME(\chi) = \frac{1}{N}\sum_i \langle P(C_i = 1 | SC_i = 1) - P(C_i = 1 | SC_i = 0) \rangle \quad (3)$$

The marginal effect of speed camera on collisions/casualties will be estimated in STATA 14 as clearly demonstrated in the next section.

4. Empirical Results

4.1 Characteristics of Respondents, Camera, Road Traffic Collisions and Casualties

Demographic Characteristics of Sampled Drivers

Table 4.1.1 deals with the demographic characteristics of sampled drivers, following the tabulated information, all the sampled drivers are of the male gender this may be due to the fact that this domain of economic activity is still predominated by the male sex especially commercial transportation being within an urban community or in inter-urban transportation. Evidence from both developed and developing countries is showing that men and women have different patterns in traveling, driving and accessing public spaces. Women typically walk longer distances than men and make frequent, shorter trips with more stops to combine multiple tasks. Men, by contrast, tend to follow more direct and linear patterns. Females engage in more non-work-related travel than males and are more likely to be accompanied by children or elderly relatives. They are also more reliant on public transport. Thus, transport has a gender bias problem.

Among the men sampled 79.50% are married with 20.5% single, about 19.5% had no education, primary education (44.50%), secondary education (25%) and 11% of them had higher education. This implies that only very few drivers in Cameroon attained higher education level considering that the driving profession is not a highly skilled to acquire. The sample equally revealed that the majority of drivers falls between the age group of 36 years to 45 years with about 34%. This is quite a mature age group of hard working age and the result corresponds to the views of Elvik & Høye (2011). The other age bracket of drivers includes, less than 25 years (9%), between 25 years to 35 years (31.5%), between 46years to 55 years (14.50%) and greater than 56 years of age is 11%.

Generally, across the world, the minimum age requirement for a commercial driver's license varies depending on the type of commercial vehicle and the type of commerce. A person must be at least 18 years old to apply for a driver's license and drive a commercial vehicle within the same municipality. A person must be at least 21 years old to drive a commercial vehicle across urban center lines or transport hazardous materials that require placards. Additionally, a person must have no prior disqualifying criminal offenses and complete an entry-level commercial driver training program.

Among the drivers sampled, about 40% of them had between five years to ten years of experience in driving implies the drivers are not novice but knows what exactly they are into, moreover considering that most of the drivers sampled are inter-urban drivers 10 years of experience is an appropriate age for exploitation. Other age group includes; less than five years of experience (25%), ten to fifteen years of experience (18%) and greater than 15 years of experience is 17%. Considering the household size of the sampled drivers, we observed that despite the mature age group of the drivers most of them had Small Household size (< 5 persons) with about 58%. Other includes, average household size (7- 10 persons) with about 26.5% and large household size with about 15.5%.

Characteristics of Sampled Drivers Perception on Speed Cameras

In Table 4.1.2 we attempt to discuss four main issues of the perspective of drivers with respect to the use of speed cameras: firstly, the drivers that are conscious of speed cameras and regulate their speed on highway, secondly, the availability of speed cameras on high way, thirdly, the drivers who knows that speed cameras are used to prevent road traffic accidents and finally the drivers indicated absence of speed cameras on the road they plied.

Concerning drivers that are conscious of speed cameras and regulate their speed on highway, 71% of the respondents confirmed that they make use of speed camera to regulate speed while 29% indicated that they do not. Once a driver is aware that a speed camera is installed in a certain area, they tend to behave themselves and drive the speed limit in said area and they transmit the message to their colleagues. If a driver encounters enough speed cameras, they will be more likely to wonder (or assume) if there are such cameras anywhere they drive, especially in urban areas and school zones. However, while drivers may begin to adjust their driving behavior in areas that they become aware are being surveyed with cameras, this behavior does not always transfer to other areas and intersections, especially where they can confirm there are no cameras. Familiar areas that are known by drivers to be camera-free may still generate speeding, reckless driving and the running of red lights.

Focusing on the availability of speed cameras on high way, a majority of road users confirms the availability of speed cameras on Cameroon highway roads. The Ministry of Transport informs that in early March 2021, it acquired speed camera enforcement systems to reduce traffic accidents in Cameroon. The Ministry of Transport has decided to install surveillance cameras in 100 interurban transport buses belonging to various travel agencies, serving the Yaoundé-Douala, Douala-Bafoussam and Bafoussam-Yaoundé axes. An initiative that is part of the project for the intelligent and centralized management and monitoring of interurban transport, the pilot phase of which was launched on Monday, September 27, 2021. This intelligent jumbo bus surveillance system will make it possible to monitor the behavior of drivers, the control of the biometric parameters of the drivers, the tracking of interurban vehicles by geo-location, the monitoring of the exterior and interior environment of the vehicle using on-board smart cameras, dangerous practices, if they persist, will no longer escape the gaze.

In relation to drivers who know that speed cameras are used to prevent road traffic accidents, more than 50% of the driver's respondents confirm this. Considering that the Ministry of Transport informs that in late February 2021, it acquired speed camera enforcement systems to reduce traffic accidents in Cameroon. It can be concluded that drives in Cameroon are all aware of the use and relevance of speed cameras. Finally, in relation to drivers who indicated absence of speed cameras on the road they plied. Cameroon does not have speed cameras distributed in all the roads in Cameroon especially within the cities. The Ministry of Transport equips 100 intercity buses with surveillance cameras to reduce traffic accidents and not taxis that ply the municipalities.

Characteristics of Drivers Perception on Traffic Collisions and Casualties

Statistically, Table 4.1.3 presents the characteristics of drivers' perception on road traffic collisions and casualties. Here, 87% drivers indicated of being victims of road traffic collisions while 79.5% noted that they have had major casualties on road accidents. According to government statistics, Cameroon records an estimate of 16,583 road accidents each year, killing over 1,000 people, and approximately 6000 according to WHO estimates per year. More so, road traffic injuries are a major cause of death and disability in sub-Saharan Africa, including Cameroon.

In the same way, most of the accidents and serious injuries obtained by drivers in Cameroon is cause by a number of factors: about 38% revealed that excess speed is a problem, 37.5% mentioned poor state of the vehicle, 3.5% indicated they had accidents due to distractions in driving, 13% mentioned accident in Cameroon is cause by drug consumption. About 18% said accident is cause by poor weather conditions. About 31% confirmed that accidents are caused by poor state of roads mean while 12% said it is due to non-compliance with road traffic laws.

Others indicated that it is drivers fatigue and it is about 10%, about 23.5% revealed that accidents in Cameroon is cause by reckless driving and finally 16.5% underscored that accident is cause by inadequate knowledge in driving. All these factors are consistent with the statistics of the Governments of Cameroon, which stipulated that the causes of road accidents in Cameroon include: human causes, which account for 70% of road traffic accidents in Cameroon. Driver's inattention, excess speed, and poor driving skills (especially amongst drivers with no legal driving licenses and over 7000 drivers with fake licenses) respectively account for most common causes, which are: overcrowded buses, bad roads, corruption and poor state of vehicles.

4.2 Determinants of the Use of Speed Cameras

Table 4.2 presents the determinants of the use of speed cameras by drivers. The result shows that education (99.6%) is positive and significantly influencing the drivers use of speed cameras and the result is significant at one percent level. As revealed in the literature, traffic injuries are among the leading causes of death and disability in many countries. The

knowledge, attitudes, and practice of drivers towards traffic regulations are key factors in decreasing traffic injuries and deaths. Peer-led education is a credible approach in influencing students to modify their behavior positively. Eighty-two drivers (48.5%) with the educational levels of diploma and higher had greater knowledge of traffic regulations than the other drivers.

Being a driver as an occupation is equally enhancing the use of speed cameras in driving to about 51.6% and the result is significant at 10% level. As noted earlier, sites with cameras saw a decrease in mean speeds, a decrease in the likelihood that a driver was driving at more than ten miles per hour above the speed limit, and a reduction in the likelihood of a crash resulting in an incapacitating or fatal injury. In a phone survey of drivers in the community, 95% were aware of the speed cameras, and 76% of those aware had reduced their speeds because of the cameras. It is already mentioned in the literature that the real impact of all these new types of traffic cameras lies in their mere presence. When drivers know that Intersection X has speed cameras, they tend to be more careful around it, much more than Intersection Y where there is no speed camera.

Married drivers are also observed to be making use of speed cameras when driving. Married here signify being responsible and so for the sake of their families will turn to be more conscious than otherwise. The aged drivers are always more careful in driving than the young folks, this is because of their more respect for life than otherwise. Most drivers that once had a road traffic accident are more careful in doing than any other. They actually respect the speed cameras, road signs as a result of their initial experience and so promote the use of speed cameras.

4.3 Implications of Speed Cameras on Road Traffic Collisions and Casualties

Speed Cameras and Road Traffic Collisions

Table 4.3 presents the estimate of speed cameras on traffic collision. The result shows that speed Camera is negatively affecting traffic collision. Meaning that a unit increase in the number of speed camera will reduce road traffic collision by 41.4% and the result is significant at one percent level. Thus, being a red-light camera, speed camera, bus lane camera, road rule camera or road safety camera our study as estimated by the probit technique shows that mobile cameras and fixed cameras has the probability of reducing road traffic collisions. These cameras detect traffic violations.

In relation to our study, traffic violations include speeding, red traffic light violation, or vehicles going through the toll booth without paying the toll. Worldwide speed cameras increase road safety. These cameras reduce 22-44% of road fatalities. Hence; fewer injuries on-road and more safety overall. Wider deployment of cameras will surely increase law enforcement and discipline among drivers. These cameras function such that when a driver is traveling fast and over speeding, the system takes a photograph of the vehicle and mobile cameras can change their location and can be on any road as they are mounted on vehicles. However, the intersection cameras work differently. This camera depends on sensors in the road. These in-road sensors are located at a specified distance. These sensors determine the speed of the car by measuring the time taken to travel by a vehicle from one sensor to another. If a vehicle approaches with high-speed, then the camera clicks. In addition, on highways and expressways cameras are mounted above the flow of traffic. They somewhat work like mobile cams. These cameras transmit a radar beam on the flow of traffic. This beam bounces back from the moving vehicle & enters into the camera again. It gives highly accurate speed data of the moving vehicle. If speed is higher than the speed limit, then the camera takes a photograph.

As what is obtained the literature, studies consistent with ours such as that of Aarts et al (2006) have shown that speed cameras can be an effective means of reducing vehicle crashes and deaths and injuries without compromising mobility. Reductions in outcomes across studies ranged from 5% to 69% for collisions, 12% to 65% for injuries, and 17% to 71% for deaths in the immediate vicinity of camera. The reductions over wider geographical areas were of a similar order of magnitude. Speed safety cameras are an important tool and numerous studies have shown that cameras reduce speeds and crashes on all types of roads. The control variables as from Table 4.3 complementing speed cameras in reducing collision are: being a driver as an occupation, had obtained casualty in traffic accident, while variables such as poor weather and large household size instead increase road traffic collision. The impact of weather conditions, various weather conditions can significantly increase the risk of driving on the road. Heavy rain, strong winds, high temperatures, and visual impairment may cause a driver to lose control of a vehicle and result in a car accident. Severe weather conditions have a strong correlation to causing auto accidents, and drivers need to be mindful of this risk. In this studies even suggest that drivers should also be cautious before driving on roads during severe weather conditions as a driver may be better off waiting until a storm has passed to leave home. They may also want to pull over to the side of the road before completing a journey during a thunderstorm, hurricane, or tornado.

Table 4.3 equally present the estimate of speed cameras on road traffic casualties. The result revealed that, a unit increase in the number of existing speed cameras as a proportional probability effect of reducing the number of road traffic casualties by 6.9% and the result is significant at 10% level. It is argued that by reducing velocity of motor vehicles, speed cameras reduce kinetic energy and therefore severity of the

casualty, hence automated speed camera enforcement is effective in reducing speed and speed-related crashes. Our study is consistent with that of Peden et al (2004) they revealed that road traffic collisions are an important cause of death and disability worldwide. Every year around the world 1.2 million people are killed and up to 50 million are injured or disabled as a result of road traffic collisions.1 Morbidity from road traffic collisions is expected to increase in future years, and it is estimated that road traffic collisions will move from ninth to third place in the global burden of disease ranking, as measured in disability adjusted life years.

Another associated study consistent with ours, is that of Parker et al (1996), who postulated that measures to reduce traffic speed are considered essential to reducing casualties on the road. Speed cameras are increasingly used to help to reduce traffic speeds in the belief that this will reduce road traffic collisions and casualties, and an expansion in the use of speed cameras is under way in many countries, most notably the United Kingdom. The use of speed cameras is controversial, however. Vociferous opponents, including some motoring associated organizations, oppose their use, and cameras are often criticized in the media. The lack of readily available evidence of the effectiveness of cameras has made it difficult for road safety and health professionals to engage in an informed debate about the effectiveness of speed cameras. As mentioned earlier, all traffic violations recorded by the camera undergo secondary speed verification. So, the system carries out two independent measurements of every traffic violation. Thus, these measurements are compared for consistency before issuing the fine. These systems have a small tolerance of 2 Kmph for fixed and 3 Kmph for mobile cameras.

Poor weather condition is observed to be increasing road traffic casualties by 7.9% as per the result in Table 4.3. This result is consistent with that of the US Department of Transportation reports that about 6,250 people die yearly from weather-related auto accidents. Over 480,000 people are injured in weather-related crashes every year. Certain weather conditions also account for crashes, and the statistics for over ten years are as follows: (1) Wet Pavement: 74 percent of weather-related crashes, Rain: 46 percent, Snow: 17 percent, Ice: 12 percent and Fog: 3 percent. These car accident statistics indicate how dangerous it can be for drivers to travel on wet roads. Drivers may want to reconsider or postpone a trip until weather conditions have cleared and roads have dried. Severe weather conditions may result in snow, slush, flooding, and debris accumulation inroads. Freeway traffic speeds may also be reduced due to strong winds, snow, and sleet conditions.

4.4 Challenges Faced by Drivers with the use of Speed Cameras

Table 4.4 shows the practical challenges faced by drivers with the use of speed cameras. Among these challenges are: lack of awareness, sudden Speed change, inadequate signage (poor road signs), limited visibility, technical limitations and privacy concerns.

Lack of awareness is a major cause while drivers do not make good use of cameras. About 72.5 respondents indicated that unawareness plays a big on drivers' avoidance in using speed camera. Relative to comparable sites without cameras and driver's awareness, sites with cameras saw a decrease in mean speeds, a decrease in the likelihood that a driver was driving at more than ten miles per hour above the speed limit, and a reduction in the likelihood of a crash resulting in an incapacitating or fatal injury. 8 In a phone survey of drivers in the community, 95% were aware of the speed cameras, and 76% of those aware had reduced their speeds because of the cameras. Sudden speed change is another challenge with the use of speed cameras. The safety risk is involved in driving slower than optimal speed for conditions, which an awareness of a speed camera could create. Additionally, the sudden realization of such a camera can cause an abrupt speed change by drivers, increasing the risk of rear-end accidents. Limited visibility is another challenge in the use of speed cameras. This explains why, the guidelines from the Department for Transport say: (i) speed cameras must sit in a yellow housing. (ii) the housing itself should be visible and not obscured by trees or bushes. (iii) one should be able to see the speed camera from 60 meters away in a 40 mph zone, or 100 meters for all other zones and (vi) signs should be placed in areas where there are visible camera housings - but this isn't mandatory. Even if drivers were previously unaware of their speed, speed cameras might cause them to slow down.

Visible speed cameras can deter drivers from exceeding the speed limit. Some argue that visible speed cameras are necessary to promote safe driving practices. Even if drivers were previously unaware of their speed, speed cameras might cause them to slow down. Visible speed cameras can deter drivers from exceeding the speed limit and causing accidents. Visible speed camera tickets may also encourage drivers to pay greater attention to their speed in the future, thereby reducing the likelihood that they will violate the law again. Opponents of speed cameras argue that they are nothing more than a scheme to make money. They assert that speed cameras are typically installed in areas where the speed limit is too low or where motorists are unaware of it. They also assert that visible speed cameras can result in collisions. When a driver sees a speed camera, they may slam on the brakes, resulting in a rear-end collision with another vehicle. This could result in a series of occurrences. Other relevant challenges to speed cameras include: inadequate Signage (poor road signs), technical limitations and privacy concerns. In all these, some disadvantages of speed cameras are:

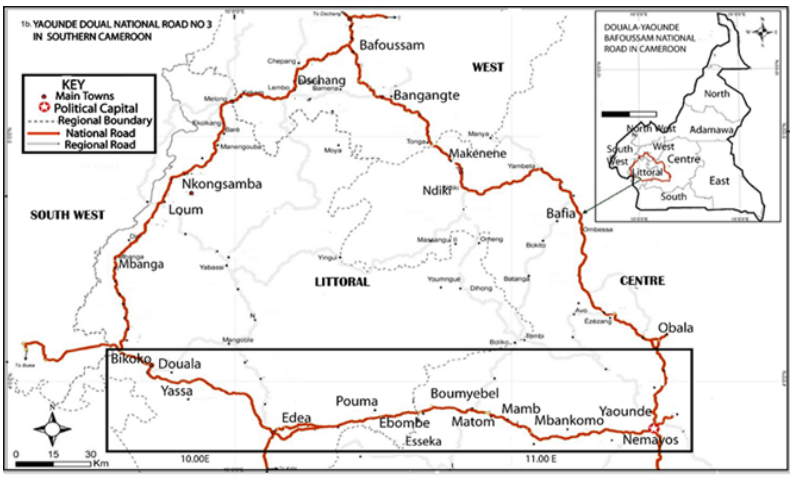

Figure 1: The road networks of Yaoundé-Douala-Bafoussam-Yaoundé

Source: MINTP (2015)

Table 4.1.1 Demographic Characteristics of Sampled Drivers

Variable	Modality	Frequency	Percent	Cumulative (%)
Gender	Female	0	0	0
	Male	200	100	100
	Total	200	100	n/a
Age	less25yrs	18	9.00	9.00
	Between25_35yrs	63	31.50	40.50
	between36_45yrs	68	34.00	74.50
	between46_55yrs	29	14.50	89.00
	56yrs and above	22	11.00	100.00
	Total	200	100	n/a
Education	no education	39	19.50	19.50
	primary education	89	44.50	64.00
	secondary education	50	25.00	89.00
	higher education	22	11.00	100.00
	Total	200	100.00	n/a
Marital Status	single	41	20.50	20.50
	married	159	79.50	100.00
	Total	200	100.00	n/a
Household Size	Small household Size (< 5 persons)	116	58.00	58.00
	Average household size (7- 10 persons)	53	26.50	
	Large household size	31	15.50	100.00
	Total	200	100	n/a
Years of experience in driving	Less than 5 years' experience	50	25.00	25.00
	5 – 10 years' experience	80	40.00	40.00
	10 – 15 years' experience	36	18.00	18.00
	Greater than 15 years	34	17.00	17.00
	Total	200	100	n/a

Source: Author

Table 4.1.2 Characteristics of Sampled Drivers Perception on Speed Cameras

Variable	Modality	Frequency	Percent	Cumulative (%)
Drivers conscious of speed cameras and regulate speed	Make Use of speed camera	142	71	71
	Does not bother about speed cameras	58	29	100
	Total	200	100	n/a
Availability of speed cameras on high way	Strongly Disagree	34	17.00	17.00
	Disagree	27	13.50	30.50
	Agree	93	46.50	77.00
	Strongly Agree	46	23.00	100.00
	Total	200	100	n/a
Drivers who knows that speed cameras are used to prevent road traffic accidents	Strongly Disagree	56	28.00	28.00
	Disagree	29	14.50	42.50
	Agree	62	31.00	73.50
	Strongly Agree	53	26.50	100.00
	Total	200	100.00	n/a
Drivers indicated absence of speed cameras on the road they ply	Strongly Disagree	73	36.50	36.50
	Disagree	25	12.50	49.00
	Agree	41	20.50	69.50
	Strongly Agree	61	30.50	100.00
	Total	200	100	n/a

Source: Author

Table 4.1.3 Characteristics of Drivers Perception on Road Traffic Collisions and Casualties

Variable	Modality	Frequency	Percent	Cumulative (%)
Drivers victims of road traffic collision	Yes	174	87.00	87.00
	No	26	13.00	100.00
	Total	200	100	n/a
Drivers victims of road traffic collision casualties	Yes	159	79.50	79.50
	No	41	20.50	100.00
	Total	200	100	n/a
Driver had accident due to excess speed	Yes	76	38.00	38.00
	No	124	62.00	100.00
	Total	200	100.00	n/a
Had accident due to poor state of the vehicle	Yes	75	37.50	37.50
	No	125	62.50	100.00
	Total	200	100.00	n/a
Had an accident due to distraction	Yes	69	34.50	34.50
	No	131	65.50	100.00
	Total	200	100	n/a
Had an accident due to drug consumption	Yes	26	13.00	13.00
	No	174	87.00	100.00
	Total	200	100	n/a
Had an accident due to poor weather condition	Yes	36	18.00	18.00
	No	164	82.00	100.00
	Total	200	100	n/a

Had an accident due to poor road condition	Yes	62	31.00	31.00
	No	138	69.00	100.00
	Total	200	100	n/a
Had an accident due to non-compliance road traffic laws	Yes	24	12.00	12.00
	No	176	88.00	100.00
	Total	200	100	n/a
Had an accident due to fatigue	Yes	21	10.50	10.50
	No	179	89.50	100.00
	Total	200	100	n/a
Had an accident due to reckless driving	Yes	47	23.50	23.50
	No	153	76.50	100.00
	Total	200	100	n/a
Had an accident due to inadequate training	Yes	33	16.50	16.50
	No	167	83.50	100.00
	Total	200	100	n/a

Source: Author

Table 4.2 Determinants of the Use of Speed Cameras

Variable	Estimation method: Probit Estimate			
	Coef.	Std. Err.	Z	P>|z|
	Speed Camera in driving			
Experience in driving (1= between 10-15 years)	.3453501	.3048816	1.13	0.257
Household size (1= large size)	-.2102076	.3324673	-0.63	0.527
Occupation (1= driver)	.516613999*	.3093497	1.67	0.059
Education (1= higher)	.99601596***	.3688948	2.70	0.004
Marital Status (1= married)	1.099859***	.327277	3.36	0.001
Age	.3320468**	.1308008	2.54	0.011
Once a Victim of traffic collision	1.132955**	.5372512	2.11	0.035
Had obtained Casualty in traffic accident	.74238528*	.407904	1.82	0.087
Excess speed (1= Yes)	.1868905	.2568218	-0.73	0.467
Poor weather (1 = Yes)	-1.11801***	.2970319	3.76	0.000
Constant term	-1.473534*	.7638549	-1.93	0.054
Pseudo R2	0.1982			
LR chi2/ Prob > chi2	47.04[10; 0.0000]			
Log likelihood	-95.169499			
Number of observation	200			

Source: Author

Table 4.3 Estimate of Speed Cameras on Traffic Collisions and Casualties

Variables	Estimation method: Probit Estimate	
	Coefficient	Coefficient
	Traffic Collision	Traffic Casualties
Speed Camera	-.414*** (2.61)	-.069* (1.92)
Experience in driving (1= between 10-15 years)	-.865 (-0.60)	-.347 (-1.09)
Household size (1= large size, 0 otherwise)	.171*** (3.14)	.376* (1.87)
Occupation (1= driver)	-.334* (1.88)	-.936** (1.97)
Education (1= higher)	.217 (0.52)	.503 (0.71)
Marital Status (1= married)	-.869 (-0.68)	.242* (1.81)
Age	.154 (0.85)	0.012** (2.29)
Once a Victim of traffic collision	n/a	0.616*** (2.58)
Had obtained Casualty in traffic accident	-.034*** (-7.11)	n/a
Excess speed (1= Yes)	-.010 (-0.11)	3.887 (1.04)
Poor weather (1 = Yes)	.018*** (7.30)	.079*** (3.32)
Constant term	-.127*** (4.75)	-.437 (1.09)
Pseudo R2	0.2702	0.1202
LR chi2/ Prob > chi2	11.44[0.0020]	8.01[0.0120]
Number of observation	200	200

Source: Author

Table 4.4 Practical Challenges Faced by Drivers with the use of Speed Cameras

Factor	SD		D		A		SA	
	F	%	F	%	F	%	F	%
Lack of awareness	15	7.50	40	20.00	96	48.00	49	24.50
Sudden Speed change	49	24.50	7	3.50	85	42.50	59	29.50
Inadequate/poor signage	37	18.50	18	9.00	75	37.50	70	35.00
Limited visibility	51	25.50	12	6.00	87	43.50	50	25.00
Technical limitations	51	25.50	13	6.50	51	25.50	85	42.50
Privacy concerns	49	24.50	7	3.50	85	42.50	59	29.50

Source: Author

(i) They can cause drivers to drive below the posted speed limit, creating a road safety hazard, (ii) they can generate tickets for false readings due to radar errors, (iii) they can increase rear-end collisions because of sudden braking at yellow lights, stop signs, and school zones and (iv) they have no evidence of improving road safety or reducing deaths.

5. Conclusion

The study covers various aspects related to the characteristics of sampled respondents, road traffic collisions and casualties, the determinants of speed camera use, the implications of speed cameras on road traffic collisions and casualties, and the challenges faced by drivers with the use of speed cameras. In terms of the characteristics of the sampled drivers, the study reveals a gender disparity in the driving profession, with all sampled drivers being male. The education levels of the drivers were generally low, with only a small percentage having higher education. The majority of drivers belonged to the age group associated with experience and maturity.

The study also provides insights into the minimum age requirements for obtaining a commercial driver's license and the driving experience of the sampled drivers. A significant proportion of drivers had between five to ten years of driving experience, indicating a sufficient level of knowledge and experience in their profession. Regarding the drivers' perception of speed cameras, the study found that a majority of respondents were aware of the presence of speed cameras and regulated their speed on the highway accordingly. However, this behavior was not always transferred to areas without speed cameras, leading to speeding and reckless driving in camera-free zones. Moving on to the implications of speed cameras on road traffic collisions and casualties, the study found that an increase in the number of speed cameras significantly reduced road traffic collisions by 41.4% and road traffic casualties by 6.9%. Different types of speed cameras contributed to reducing collisions by detecting traffic violations, promoting law enforcement, and discipline among drivers.

The study also examined the impact of control variables and weather conditions on road traffic collisions and casualties. It was found that being a driver as an occupation enhanced the effectiveness of speed cameras in reducing collisions. Drivers who had previously experienced a casualty in a traffic accident were more conscious and likely to adhere to speed cameras and road rules. Poor weather conditions increased the risk of road traffic collisions and casualties. Lastly, the study discussed the challenges faced by drivers with the use of speed cameras. Lack of awareness, sudden speed changes, limited visibility, inadequate signage, technical limitations, and privacy concerns were identified as significant challenges. Visible speed cameras were found to deter drivers from exceeding the speed limit and causing accidents, but opponents argued that they could lead to collisions if drivers abruptly brake upon seeing them. Overall, the study's findings highlight the positive impact of speed cameras on preventing road traffic collisions and casualties, the importance of control variables and weather conditions, and the challenges faced by drivers. The results contribute to the existing literature on speed cameras and provide valuable insights for informed debates and decision-making in the field of road safety.

In conclusion, this study addressed the research problem of evaluating the impact of speed cameras on road traffic collisions and casualties. The general objective was to assess the effectiveness of speed cameras and identify the challenges faced by drivers in their use. The research hypothesis posited that an increase in the number of speed cameras would lead to a reduction in road traffic collisions and casualties. To achieve these objectives, a comprehensive methodology was employed, including sampling male drivers, analyzing their characteristics and perceptions, examining the implications of speed cameras on road safety, and identifying the challenges associated with their use. The study also considered control variables and weather conditions to account for potential influencing factors. The key results obtained provide valuable insights into the effectiveness of speed cameras. An increase in the number of speed cameras led to a significant reduction in road traffic collisions by 41.4% and road traffic casualties by 6.9%. These findings support the research hypothesis and demonstrate the positive impact of speed cameras on road safety. Moreover, the study shed light on the challenges faced by drivers concerning speed cameras, such as lack of awareness, sudden speed changes, limited visibility, inadequate signage, technical limitations, and privacy concerns. Addressing these challenges is essential to ensure the optimal effectiveness and acceptance of speed cameras as a road safety measure. The study suggests that decision makers in the transport sector should multiply the provision of speed cameras. This is a wise step in the prevention of road traffic collisions and casualties in Cameroon and better labour market.

Acknowledgement

Nill

Funding

No funding was received to carry out this study.

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