

## Investigating Level of Awareness on Traffic Control Devices to Minimize Traffic Accident on Pedestrians in Gondar Town

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### Abstract

Traffic accident increased intermittently in alarming rate and it was a serious problem throughout the globe particularly in developing countries like Ethiopia. This research concerns on investigate the level of awareness on traffic control devices to minimize traffic accident on pedestrians in Gondar town. To address the objective the study uses twelve (12) questionnaires that distributed for 150 respondents in the town. The study uses simple random sampling mechanism to allocate questionnaires for defined sample size. Basically, the study uses data collected through self-administrating questionnaires from randomly selected pedestrians of the town to reveal the final findings. Essentially, descriptive statistical analysis was used to analyze the data. Based on analysis the study revealed that traffic accident on pedestrians was happen due to lack of awareness about traffic control device, no enough traffic control devices in the town, merely existing traffic control device was not functional, the pedestrians were not loyal to the rule and regulation and etc. were fundamental factors in the town. As a result, traffic accident on pedestrian mostly related to the above findings. In order to overcome the problem the study recommend that government and other stakeholder must create awareness on traffic control devices usage to the population of the town particularly pedestrians. Not only this, drivers must giving priority for pedestrians by avoiding parking and stopping on improper place like side walk, zebra crossings and etc. In addition to this the government must add the number of traffic control devices and maintenance existing traffic control devices properly to minimize road traffic accidents on pedestrians in the town.

**Keywords:** Awareness; Pedestrians; Traffic accident; Traffic control devices

### Introduction

Everybody travels to the work, play shop, or do business. All raw materials transported from the land to the place of manufacturing or usage, and all goods moved from factory to the market place and from the staff to the customer. To facilitate their movement, people use different ways of transportation including road, air, water, train etc. Road transport is the easiest, accessible and closes to people. As a result, road transportation provides benefits both to nations and to individuals by facilitating the movement of goods and people from place to place. In Africa, over 80% of goods [1] and people transported by roads and in Ethiopia road transport accounts for over 90% of freight and passenger movements in the country every year [2]. However, the increase in road transportation has engaged a considerable burden on the people's lives. The fatality and injuries of road traffic accident on pedestrians was the major one [3]. According to Ethiopian Federal Police report (2008/09-2010/11), each year more than two thousand people die and ten thousand people injured because of road traffic accidents. The situation in road traffic accident was most severe in Sub-Saharan Africa where the lives of Millions were lost [4]. From those contributing factor of traffic accident lack of awareness creation about traffic controlling devices had their own significant role. According to Ethiopia Road Authority [5] traffic control devices provide essential information to road users for their safe and efficient maneuvering on the road with minimum rate of traffic accident. As a result, the study emphasizes on investigating the level of awareness on traffic control devices to minimize traffic accident on pedestrians in Gondar town. Pedestrian was person who is walking, especially in an area where vehicles go. Today Gondar was a home of approximately to 153,914 people and the 6<sup>th</sup> most populated town in Ethiopia [7]. Most of the populations in the town were pedestrians. Gondar town was located in North Western part of Ethiopia particularly found in north Gondar of Amhara region. According to Segni [8] the probable causes of road traffic accident occurrences in Ethiopia basically lack of respecting rule and regulation of traffic control devices. The study used twelve (12) questionnaires to analysis the benefits as well the effect of traffic control devise in study area (Refer Appendix). As a result, investigating the level

of awareness on traffic control devise had their own significant role to minimize pedestrian's traffic accident.

### Materials and Methods

#### Data type, source and methods of collection

This study used a mixed research approach to signify the reality behind traffic control device on traffic accidents to draw logical conclusion that help to draft applicable policies, strategies and rules on traffic control devices. Among the Mixed approach Transformative strategy employed in this study. According to Creswell and Plano Clark [9] transformative strategy may or may not be sequential during data collection. Accordingly, the study has given weight to quantitative design for the sake of closely looking participant's the way they respond to the questionnaires. As a result, the research was grounded on quantitative data gathered through self-administrating questionnaire.

Depending on the research perspective and strategy chosen, the researcher must choose methods for collecting data. The main type of data used in this study was primary data sources. To collect those primary data structured questionnaires were practiced. The questionnaires designed to allow the researcher to identify the benefit of awareness creation on traffic control device [10] to reduce traffic accident causes on pedestrians and traffic safety problems that road users face while moving along and crossing the roads of the town. In addition, it designed to serve the researcher to identify the level of adherence and

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understanding of population of the town on traffic control devices rule and regulations as a whole. It also designed to allow the researcher to provide measures of the traffic control devices experience, perception and attitude of pedestrians.

The study identified locations or streets in Gondar town that characterized by a dense pedestrian movement. Pedestrians randomly selected to fill the questionnaires. In this research probability sampling (simple random sampling) techniques was applied. Random sampling is often preferred because it avoids human bias in selecting samples [11]. In a simple random sample of a given size, all such subsets of the frame give equal probability. Furthermore, any given pair of elements has the same chance of selection as any other. This minimizes bias and simplifies analysis of results. In particular, the variance between individual results within the sample was a good indicator of variance in the overall population, which makes it relatively easy to estimate the accuracy of results. The methods used in this research consume questionnaires administer and completed by Gondar town pedestrians. As a sample the study prefer One hundred fifty (150) participants for questionnaires and distributed equally among in various areas those high traffic movement was observed like Shewa Dabo, Mazoria, Maraki, Piyasa, Beliko and Arada.

### Variables definition

Depending on the objective of the study, the research identified dependent and independent variables. The dependent variable was Traffic Accident (TA) on pedestrians and the independent variable of the study was awareness of pedestrians on traffic control devices (TCD).

### Method of analysis

The study used Microsoft Office Excel to analyze the data. Descriptive statistical analysis was used to analysis the level of awareness on traffic control devices in the town. It also examines the relationships between traffic accident on pedestrians and pedestrians' level of awareness about traffic control devices (TCD) function, rule and regulation, and their necessity as whole. The study defines the sample size based on marginal error with confidence level of 95%. According to Data Star [12] often, an "acceptable" margin of error used by survey researchers falls between 4% and 8% at the 95% confidence level. In spite of population amount in the town sample size were defined based on the acceptable marginal error of 8% with 95% of confidence level. The data gathered through questionnaire were properly organized and analyzed. The three main types of descriptive statistics are frequencies, measures of central tendency (also called averages), and measures of variability [13]. From those the studies prefer frequency distribution mechanism to analyses the data. As a result, the study used percentage frequency distribution method. A percentage frequency distribution was a display of data that specifies the percentage of observations that exist for each data point or grouping of data points. It was particularly useful method of expressing the relative frequency of survey responses and other data [14,15].

### Results and Discussion

Total of one hundred fifty (150) respondents were participate in this study. To bring fruitful judgment the study also uses twelve (12) questionnaires. Percentage frequency analysis was made to identify the level of awareness on traffic control devices to signify the weight for the occurrence of traffic accident on pedestrians. According to respondents the study depicted that there was a direct relationship between pedestrians' traffic accident and level of awareness on traffic control devices. Accordingly, the summary of analysis, awareness creation on traffic control device play significant roles to minimize traffic accident

on pedestrians. The following descriptions provide pedestrians level of awareness about traffic control devices in the town.

### General overview of traffic control devices and level of pedestrian awareness

The main purpose of a traffic control device was to provide information to road users so they can operate their daily life safely along a highway or street. Pedestrians use those traffic control devices to facilitate their day to day movements. From the from randomly selected population the study shown that around 45 percent of total respondent depict that they had information about traffic control devices but, the rest 55 percent of the respondents do not have any information. In the same condition, from 55 percent those responds No, around 56.4% and 49.1% of the respondent revealed that lack of serviceability and awareness creation were most probable causes for lack of information about traffic control devices as shown in Figure 1.

In addition to the above information from stated participant of questionnaires' even if majority of respondent were not familiar with traffic control devices some of pedestrians indicated that they were familiar with most of traffic control devices namely, Road marking (Zebra), Traffic lights, Road signs, Automatic speed controlling devices and Traffic commands. From the study concluded that pedestrians had little awareness about some devices but the respondents mostly were memorable with the name of devices other than their functions.

### Functional constraint of traffic control device in the town

Due to resource constraints and irresponsibility of stakeholder traffic control device installed in the Gondar town cannot maintain periodically, not updated with technology innovation. As a result, most of the traffic control devices were not functional. As revealed by respondent on functionality of traffic control devices around 61% of the participant stated that most of the traffic control devices in the town was not functional (Figure 2).

In addition to this, respondent agreed that the problem observed on traffic control device that hinder their functionality were signs or markings faded, improper placement, old technology were major cause for un functional nature of the existing traffic control devices. To overcome those problem the participant recommend that traffic control devices must be placed in appropriate location, routine as well as periodic maintenance should be under consideration and latest technology would be practiced in the town.

### Awareness creation means on traffic control devices

Among various methods of awareness creation approach like media, meeting, orientation in education sector, home to home orientation and etc. were basic mechanism to create awareness on traffic control device usage, rule and regulation. From collected data the respondent forward around 77% aware about traffic control device via the above listed methods. As shown on the Table 1 below from those 77% around 73% and 60% indicated that they aware via radio and television consecutively about traffic control devices.

Both Radio and Television had a wide coverage in Gondar town. As a result, radio and television had significant impact to change attitudes of pedestrians on traffic control devices. In case, the government and stakeholder must give attention to education road user about traffic control devices through broadcast media.

### Awareness on rules and regulation of traffic control devices

In many countries, the rules of the road codified, setting out the legal requirements and punishments for breaking' them. In developed

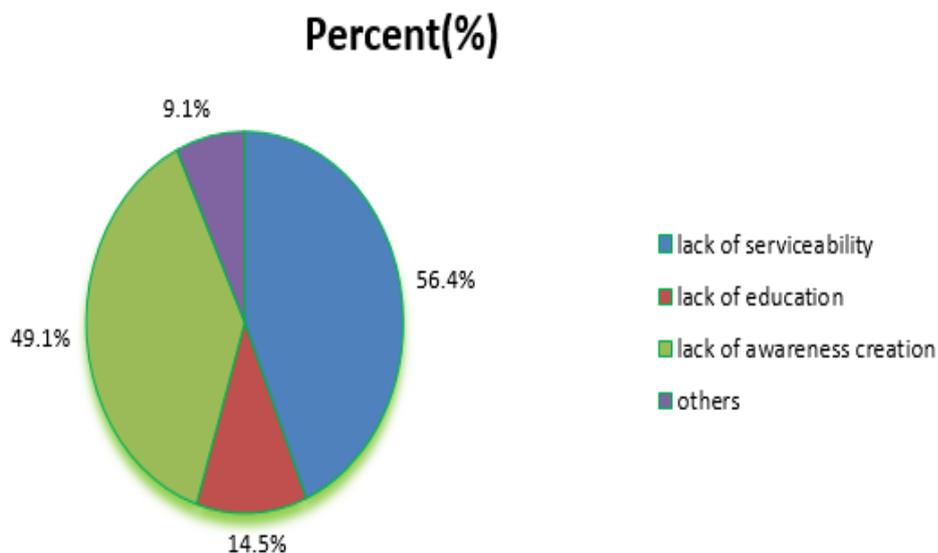


Figure 1: Reasons for lack of information on traffic control devices.



Figure 2: Functionless traffic control devices in the town.

Mechanism	News paper	Radio	Television	Internet	School Discussion	Meeting	Home to Home
Number	17	85	46	17	27	20	21
Percent %= (N × 100)/116	14.2	72.7	59.7	14.2	23.4	16.9	18.2

Table 1: Means of awareness creation on traffic control devices.

Options	Pedestrians	
	Number (#)	Percent (%)
As it is	14	9
Reduce	34	25
Avoid	19	12
Maximizing	39	25
No comment	44	29
<b>Total</b>	<b>150</b>	<b>100</b>

Table 2: Pedestrian's assumption after applying techniques of awareness creation.

countries, road traffic accident had decreased since the 1960s because of successful interventions traffic laws on traffic control device [16]. Even if around 55% of the respondent were not familiar with traffic control

devices accordingly from the remaining familiar respondent around 54% were familiar with Rule and Regulation of traffic control devices [17-19]. This indicates that from familiar respondent the majority of

the pedestrians had awareness about rules and regulations but this does not mean that they implement and regulate those rules and regulation. This aggravates the cause of accidents that happen due to the lack of awareness.

### Respecting rule and regulation of traffic control devices

From those familiar 54% familiar with the rule and regulation of traffic control devices the study revealed that around 55% of the participant cannot respect the rule and regulation of traffic control devices. As a result, the respondent depict that both the government and population play vital role in respecting the rule and regulation of traffic control devices by create awareness, punish the violator and being committed for rule and regulation wisely.

### Necessity of awareness creation on traffic control devices

Accordingly from 150 pedestrian's response, about 95% of pedestrians believe that awareness creation on traffic control devices were mandatory. As a result, the respondents also bring their view on necessity of awareness creation it minimizes road traffic accidents, it increases the life expectancy of traffic control devices, and it also creates saturated awareness about rules and regulation of traffic control devices.

### Accident and awareness creation on traffic control devices

From the survey data respondents indicated that around 78% believes lack of awareness creation on traffic control devices enforces pedestrians for traffic accidents. The respondent also revealed that the crucial problems those happen due to lack of awareness creation were accidents (Death, injuries and property damage), social, and economic and political crisis. As a result, obeying the rule and regulation had their own significant impact on minimizing those problem faced the pedestrians and other road users.

### Occurrence of accidents due to improper use of traffic control devices

According to pedestrians response around 31% had observing accidents happen due to misuse of traffic control devices while the remaining 62% don't observe any accidents due to misuse of traffic control devices physically. Among those respondents observing accident in Gondar town they revealed place where mostly accident register due to misuse of traffic control devices were around Auto Park, Atse Bakafa School, Mazoriya (kebele 18), Azezo –Metema road etc.

### Assumption of pedestrians after applying awareness creation techniques

The record in the Table 2 below shows that around 25% of respondent think that there would be a reduction of accidents as a result of awareness creation while other 25% of respondent opposite. In the same approach 12% of participant believe that it avoid accidents and 9% of the respondents think that no change in accident occurrence either there was an awareness creation or not in Gondar town.

### Weather condition and traffic accident on pedestrians

As shown in the table below around 40% of respondent admit that weather condition / environment can have their own significant impact to enforce pedestrians for traffic accident. That accident faced the pedestrians due to weather condition probably caused by traffic control devices failures, and by prohibits pedestrians. In order overcome the problem faced pedestrians due to environment fluctuation relevant to traffic control devices they stated basic mechanisms that preserve accident happen due to weather condition on pedestrians by:

- Creating some ground rules for drivers and pedestrians when there was some kind of weather change.
- Constructing traffic control devices that cannot be affected by weather conditions and fluctuations.

### Conclusion and Recommendations

Traffic control devices (TCDs) are markers, signs and signal devices used to inform, guide and control traffic, including pedestrians, motor vehicle drivers and bicyclists. The aim of this study was to investigate the level of awareness on traffic control devices to minimize traffic accident on pedestrians in Gondar town. Based on questionnaires filled by random 150 pedestrians of the town the study concluded; awareness creation on traffic control devices plays vital role in minimizing traffic accident on pedestrians, relatively pedestrians had poor understanding about usage traffic control devices, poor loyalty of pedestrians for the rules and regulation of traffic control devices. Lacks of knowledge about traffic control device have effects on pedestrians to expose to accident. There are insufficient traffic control devices in the Gondar town. Poor maintenance and development for those traffic control devices and Weather condition has its own way of affecting the traffic control devices.

Based on research findings the study recommends that the government and other stakeholder should create awareness for pedestrians about traffic control devices, the rules and regulations, and usage of traffic control devices to minimize traffic accident happen on pedestrians. Therefore, not only to pedestrians road safety education should give to all sections of the community. Also, government must penalize those pedestrians' violet the rule and regulation of traffic control devices. In addition to this, those traffic control devices must constantly checked and maintained to provide good serviceability and perform their function properly.

Finally, traffic control device was a concerning area where traffic accident was probable happen on pedestrians due to their lack of proper usage that habituated due to lack of awareness and their functionality in Gondar town. As a result, stake holder must give special emphasis to terminate or minimize traffic accident on pedestrians due to improper usage of traffic control devise and etc.

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