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AN EXPLICIT STUDY OF PEDESTRIAN AND VEHICULAR TRAFFIC AT THE MAKANDE CROSSING POINT TO DETERMINE IF A PEDESTRIAN CROSSING FACILITY IS JUSTIFIED

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ABSTRACT

The major task was to determine if a formal pedestrian crossing point was required at Makande crossing zone. Specifically, the average traffic volume and speed during peak hours, average pedestrian volume during peak hours at Makande zone and the pedestrian behavior such as overall time used in completing a crossing maneuver, crossing trajectory and comfort when crossing the highway segment was analyze. Characteristics such as vehicular speed, pedestrian crossing and waiting times, pedestrian and vehicular volume were all investigated. Data was acquired majorly through manual tallying. After acquiring these data, it was scientifically analyzed to prove if indeed there was conflict in that area using 1×10^{8} the PV^2 method which relates the pedestrian and vehicular volume. A value more than would necessitate a formal crossing point. Other site characteristics such as route to school, shops and community facilities were also investigated to establish the importance of the crossing point. The collected data was then presented in tabular form and also graphically and later analyzed mathematically to identify if a formal pedestrian crossing point was required. It was observed that a value of PV^2 exceeded the required limit by a considerable amount, also, during the peak periods the average pedestrians and vehicles passing through that section which is basically high. The average crossing time used to safely complete a crossing maneuver was also basically high compared to 10 seconds that is actually required. Crossing was compromised in comfort and safety as most of the time pedestrians were running across. This necessitated the need for a formal crossing point. Appropriate recommendations were later on drawn at the end of the project so as to come up with an apparent solution to the crossing problem.

INTRODUCTION

The World Health Organization (WHO), the World Bank, the FIA Foundation for the Automobile and Society and the Global Road Safety Partnership (GRSP) have been collaborating on a project over the past six years to produce a series of good practice manuals covering key issues identified in the World report on road traffic injury prevention (1). The project arose out of the numerous requests made to WHO and the World Bank by road safety practitioners

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around the world, especially those working in low- and middle-income countries, asking for information to assist with implementing the report's six recommendations.

1. Identify a lead agency in government to guide the national road traffic safety effort.
2. Assess the problem, policies, institutional settings and capacity relating to road traffic injury.
3. Prepare a national road safety strategy and plan of action.
4. Allocate financial and human resources to address the problem.
5. Implementspecificactionsto preventroadtrafficcrashes, minimize injuries and their consequences, and evaluate the impact of these actions these actions.
6. Support the development of national capacity and international cooperation.

There has been considerable controversy in the United States about whether marked crosswalks increase or decrease pedestrian safety at crossing locations that are not controlled by a traffic signal or stop sign.

Many pedestrians consider marked crosswalks as a tool to enhance pedestrian safety and mobility. They view the markings as proof that they have a right to share the roadway, and in their opinion, the more the better. Many pedestrians do not understand the legal definition of a crosswalk and think that there is no crosswalk unless it is marked. They may also think that a driver can see the crosswalk markings as well as they can, and they assume that it will be safer to cross where drivers can see the white crosswalk lines.

When citizens request the installation of marked crosswalks, some engineers and planners still refer to the 1972 study by Herms as justification for not installing marked crosswalks at uncontrolled locations.That study found an increased incidence of pedestrian collisions in marked crosswalks, compared to unmarked crosswalks, at 400 uncontrolled intersections in San Diego, CA. Questions have been asked about the validity of that study, and the study results have sometimes been misquoted or misused. Some have misinterpreted the results of that study. The study did not conclude that all marked crosswalks are unsafe, and the study also did not include school crosswalks. A few other studies have also tried to address this issue since the Herms study was completed. Some were not conclusive because of their methodology or sample size problems, while others have fueled the disagreements and confusion on this matter.

Furthermore, most of the previous crosswalk studies have analyzed the overall safety effects of marked crosswalks but did not investigate their effects for various numbers of lanes, traffic volumes, or other roadway features. Like other traffic control devices, crosswalks should not be expected to be equally effective or appropriate under all roadway conditions.

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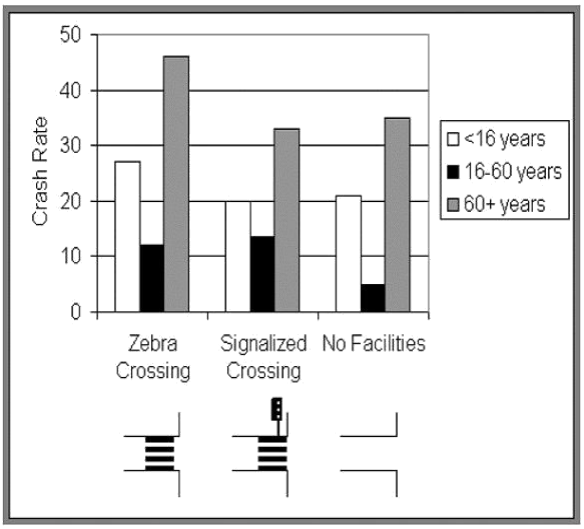
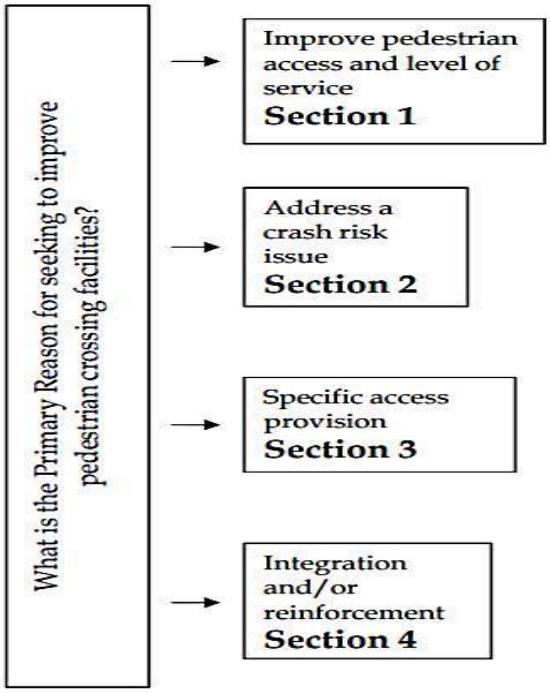


Pedestrian crash rates for the three crossing types by age group

Unmarked crossings may occur at any intersection, except at locations where pedestrian crossing is expressly prohibited. In the US these are called "unmarked crosswalks."

The simplest marked crossings may just consist of some markings on the road surface. In the US these are known as "marked crosswalks." In the UK these are often called zebra crossings, referring to the alternate white and black stripes painted on the road surface. If the pedestrian has priority over vehicular traffic when using the crossing, then they have an incentive to use the crossing instead of crossing the road at other places. In some countries, pedestrians may not have priority, but may be committing an offence if they cross the road elsewhere, or "jaywalk." Special markings are often made on the road surface, both to direct pedestrians and to prevent motorists from stopping vehicles in the way of foot traffic. There are many varieties of signal and marking layouts around the world and even within single countries. In the United States, there are many inconsistencies, although the variations are usually minor. There are several distinct types in the United Kingdom, each with their own name.

area traffic management, CBD traffic management



The National Highway Traffic Safety Association (NHTSA) reports that each year nearly 5,000 pedestrians die in motor vehicle related accidents, and approximately 76,000 pedestrians in 2012 suffered injuries when hit by a car or truck. These accidents can occur when pedestrians cross the highways. Statistics indicate that Kenya loses at least 3,000 people annually from road traffic accidents, with nearly half being pedestrians. In fact, the NTSA reports that the number of pedestrians who have lost their lives annually on the roads has dropped to 1004 by December 12, 2017. This is

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according to the latest NTSA statistics. This is attributed to increased road safety campaigns and awareness that the Authority is carrying out across the country. NTSA Director (Meja, 2015) attributed the major cause of these accidents to be speed and **inadequate pedestrianfacilities**. With the support from the private sector, there can be quick results in reversing the trend by providing speed guns, **providing safe crossings for pedestrians** and continuous pedestrian education.

EXISTING METHOD

High vehicular speeds and large traffic volumes at the Makande crossing section makes it difficult for the ever growing population of the area to access amenities across the other side of the A109 highway. The crossing area posses a great risk for the pedestrians who wish to cross to the other side. Children, the elderly and the young population in general are usually discouraged and intimidated by fast moving and high number of traffic against taking such trips. A lot of time is usually wasted in waiting for traffic streams to clear out. In addition, the crossing behavior by some of the population involve running across to the other side which is a great risk as it might cause road accidents and great loss to the society and to the economy.

METHODOLOGY

This refers to the overall strategy chosen to integrate the different components of the study in a coherent and logical way, thereby ensuring the effective address to the research problem. It constitutes the blueprint for collection, measurement and analysis of data. It includes the set of methods and procedures in collecting and analyzing measures of the variables specified in the research problem. The design of a study defines the study types which include: Descriptive e.g. case study, correlational e.g. case control, semi-experimental, experimental, review e.g. literature review and meta- analytic. Methods of collection of data included observation, photogrammetry, and literature review of existing texts and analyzed by the Ms Excel program.

DATA CONTENTS

Identifying priorities of need when planning for pedestrians and disabled people:

Safety

In planning any transport proposals safety must be of prime importance. It is then it is clear that any proposals which can provide safer facilities for these two traveler groups will contribute significantly to the achievement of both national and local safety targets. One way of prioritizing is to identify locations (existing and future) where accident risk is high.

To date most risk assessments have been concerned with establishing pedestrian risk when crossing the road, where pedestrian risk was defined as: (C.A.O'flaherty, 2006)

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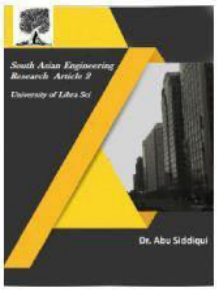

$$= \quad \times 10_2\, h$$

Similar ratios can be established for cycling. From such simple measurements the worst safety locations for pedestrians and/or cyclists can be identified and prioritized.

Conflict

Accident risk, based on actual accidents, is not the only measure which needs to be taken into account. Luckily accidents are a relatively rare event at any particular location, but conflicts between competing travellers are much more common and often result in 'near misses'. In the UK, the Department of Transport has set up a formal design procedure for establishing whether formal pedestrian road crossing facilities are necessary based on the volume of potential conflicts between pedestrians and vehicles. (C.A.O'flaherty, 2006)
The procedure is based on the

expression , where:

P = pedestrian flow (ped/h) across a 100 m length of road centered on the proposed crossing location

V = number of vehicles on the road in both directions (veh/h).

The value is the average over the four busiest hours of the day. A formal crossing

is ×normally justified if the value of

CARRIER KEY ASSUMPTION

Peak hour: This represents the most critical period of operations and has the highest capacity requirements

Formal crossing point: A way specifically designated for pedestrian travel either exclusively or with other traffic

Capacity : The maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under given roadway, geometric, traffic, environmental and control conditions, usually expressed as vehicles per hour, passenger cars per hour or persons per hour.

Delay: The additional travel time experienced by a driver, passenger or pedestrian.

Demand: The number of users desiring service on the highway system.

Pedestrian: An individual travelling on foot.

Zone: A geographic aggregation defined by land use, which generates trips within a corridor.

CONCLUSION AND FUTURE WORK

Inadequate attention has been demonstrated to provide for accessibility of non drivers. It appears that agencies involved in infrastructure development have not given pedestrian infrastructure the necessary attention and as such need to be sensitized.

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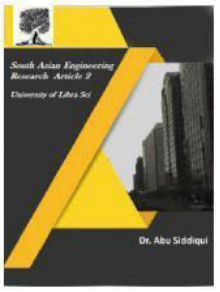

The pedestrian observation method is a low-cost method for evaluating the severance imposed on pedestrians as a result of high speed roads in urban centers. It could also serve as a method for identifying hazardous locations along a road. However, it would require some level of training for good results.

From the studies conducted in the research area, the following can be drawn:

1. It has been scientifically proven that there is need for a formal pedestrian crossing point at the Makande area. This is so the PV^2 for the road section exceeds 1×10^8 for each and every hour with the highest being 60.14×10^o during the peak period which necessitates the need for a formal crossing point. This was the main objective of the study and has been proved so.
2. During the peak periods, an average of 460 pedestrians use the section of the road for crossing while an average of 2900 vehicles pass through that section which is basically high, this makes the research hypothesis true.
3. 76.2 seconds was found to be the average crossing time used to safely complete a crossing maneuver which is basically high compared to 10 seconds that is actually required.
4. Crossing is also compromise in comfort and safety as most of the time pedestrians were running across. This confirms the last hypothesis.
5. In addition, the crossing route at that section is critical to the community since it forms the major route to schools, shops and community facilities. A critical observation made is that school going children form a larger part of those who use the highway section and usually encounter problems during crossing, i.e. wasting a lot of time waiting for adequate gaps or running across the road.

REFERENCES

1. Zeeger CV et al. Guidance for implementation of AASHTO strategic highway safety plan: Volume 10: A guide for reducing collisions involving pedestrians. Washington, DC, Transportation Research Board, 2004.

2. Vanderschuren M, Jobanputra R. Traffic calming measures: review and analysis. Cape Town, African Centre of Excellence for Studies in Public and Non-motorized Transport, 2009 (Working Paper 16–02).

3. Walk21. International Charter for Walking: Creating healthy, efficient and sustainable communities where people choose to walk [website] (http://www.walk21.com/charter/default.asp, accessed 9 January 2013).

4.1998 Agreement on global technical regulations [website]. (http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob.html, accessed 16 January 2013).

2581-4575

International Journal For Recent Developments in Science & Technology

Crossref

A Peer Reviewed Research Journal

5. Mutto M, Kobusingye OC, Lett RR. The effect of an overpass on pedestrian injuries on a major highway in Kampala – Uganda. African Health Sciences, 2002, 2: 89–93.

6. Chen L et al. Safety countermeasures and crash reduction in New York City – experience and lessons learned. Accident Analysis & Prevention (in press).

7. Viola R, Roe M, Shin H. The New York City pedestrian safety study and action plan. New York, New York City Department of Transportation, 2010.

8. Advocating for road safety and road traffic injury victims: a guide for nongovernmental organizations. Geneva, World Health Organization, 2012.

9. Ali J et al. Trauma outcome improves following the advanced trauma life support program in a developing country. Journal of J Trauma, 1993, 34: 890–898.

10.Collicott PE, Hughes I. Training in advanced trauma life support. Journal of American Medical Association, 1980, 243: 1156–1159.

11. Mock C et al. Essential trauma care guidelines. Geneva, World Health Organization, 2004.

12. Trauma system agenda for the future [website] (http://www.nhtsa.gov/people/injury/ems/emstraumasystem03/vision.htm, accessed 21 September 2012).