Addressing Lifestyles of Lower Income Groups as Contributing Factors to High Incidence of Pedestrian Fatalities on South African Roads

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ABSTRACT

The carnage on South African roads, where thousands of South African pedestrians are killed annually is unacceptably high. The lack of money, education, experience and knowledge in lower income groups often results in an abnormally high consumption of alcohol and the usage of less expensive drugs in some communities. The illegal construction of unplanned informal settlements alongside freeways and highways, where vehicles travel at very high speeds, often results in pedestrian fatalities.

The movement of intoxicated pedestrians on freeways contributes to the problems of traffic and transport authorities. They are hampered, on a daily basis, by irresponsible pedestrian behaviour in their attempts to solve this problem through traffic engineering. Parents in less affluent communities do not reflect sufficient understanding of their own social problems well enough to educate their children in terms of responsible road usage. Overpasses or underpasses as well as concrete and other barriers are seen by pedestrians as stumbling blocks that merely impair the individual’s freedom of movement.

Although various road engineering projects have been completed with reasonable degree of success, emphasis should also be placed on the education of pedestrians and the introduction of law enforcement measures to curb the illegal crossing of freeways and highways. The introduction of traffic education in schools and communities has already contributed to a better understanding of the danger of crossing roads, but irresponsible behaviour in terms of jaywalking and crossing high-speed roads in an intoxicated state is still a matter of grave concern. Continuous research to find solutions is imperative.

Historically, role players from the various disciplines and functional areas in traffic safety are specialists who tend to act in a fragmented manner. Fragmentation can be overcome by multi-disciplinary teams, whose activities should be managed in a coordinated and holistic manner.

For this reason, a holistic approach is adopted to ensure that traffic safety managers manage traffic safety holistically.
INTRODUCTION

The aim of my paper is firstly to emphasise the high incidence of pedestrian fatalities in South Africa. Secondly I refer to the lifestyles of lower income groups and how these lifestyles influence pedestrian behaviour on South African roads, in general. The lack of money, education, experience and knowledge in lower income groups often results in excessive high consumption of alcohol, as well as, the usage of less expensive drugs in some communities. Illegal construction of unplanned informal settlements, the transportation of residents between these areas and their workplace by minibus taxis and irresponsible pedestrian behaviour in general, contributes substantially to the high incidence of pedestrian fatalities. The only way to address this problem is to manage traffic safety on a holistic basis.

PEDESTRIAN CASUALTIES

From a paper delivered by Makhanya, et al,[2] at the South African Transport Conference in September 1998 in Pretoria, it seems historically that pedestrian killings, as a proportion of all road traffic fatalities, varied between 37 and 45 per cent. This implies that approximately 3700 pedestrians are killed, 10 000 seriously injured and 20 000 slightly injured every year.

In figure 1 pedestrian casualties for 1997 are compared between age groups in urban and rural areas. From figure 1 it seems that the age group 25 to 39 is the highest, whilst urban casualties are, as expected, most prominent.

In Figure 2 pedestrian casualties are displayed by severity per province for 1997. From Figure 2 it seems that pedestrian casualties in Gauteng, KwaZulu/Natal and the Western Cape are the highest. The information in tables and graphs could be misleading, but while it seems important that special attention needs to be given to the age group 25 to 39 and that the abovementioned provinces should be targeted to give special/selected attention to pedestrians, other age groups and provinces should, however, not be excluded from traffic safety actions and/or countermeasures.
In cases where statistics were analysed incorrectly, by inexperienced staff the decision process may be jeopardised and in some cases result in wrong law enforcement actions. In such cases traffic and municipal police officers could be blamed unfairly when actions taken are unsuccessful. If pedestrians, for example, were educated properly at an early age, pedestrian fatalities and casualties may be much lower when they reach older age groups. A second example is that, if sufficient pedestrian facilities were provided in the design, traffic law enforcers, could be minimised. It seems unfair that traffic law enforcers should be blamed for the lack of insufficient pedestrian facilities and education.

FACTORS CONTRIBUTING TO PEDESTRIAN CASUALTIES AND COLLISIONS

Although the reasons for the lifestyles of lower income groups in South Africa can in most cases be of socio-economic nature, the solution for a safer pedestrian environment lies elsewhere. From in-depth collision case studies which were undertaken and from the results of a National Accident Sampling System, operated by the Council for Scientific and Industrial Research (CSIR), during the seventies and eighties, it was identified that in 90 per cent of all fatal accidents one or more traffic violations were present [3]. With regard to pedestrian collisions, there are a few prominent contributing factors, namely:

- Alcohol abuse - the old problem. The drinking rate for pedestrians over and above the legal limit are just over 10 per cent and those for drivers of vehicles approximately 7 per cent. According to Steenkamp[4] this subject has become exhausted. The probability that a drunk road user should become involved in a fatal collision is six times higher than that of a sober road user.

- A large number of pedestrians prefer to wear dark clothes - especially during night times. It is difficult for drivers of vehicles to see pedestrians clothed in dark clothes. In this regard we have a dilemma. It is assumed that, apart from fashion trends, pedestrians tend to wear dark clothes to protect them from assaults at night.

- Many pedestrians tend to cross roads diagonally which makes it difficult for drivers to judge their positions and actions. These pedestrians are unable to judge the speed and distances of oncoming drivers - irrespective of their age. At the same time many pedestrians have the bad habit/attitude of jaywalking while crossing roads.

- Young pedestrians - even as old as 13 are unable to judge distances and speed of oncoming vehicles. Pedestrians, under the age of 8, are totally unable to judge any distance and speed of oncoming vehicles.

- Many pedestrians in urban areas ignore the rules of the road. They cross roads illegally and unsafely.

- Many pedestrians are illegally crossing or walking on freeways.

- Many pedestrians are of the opinion that, when being seen by a driver of a vehicle, it is the driver's responsibility to anticipate any driver/pedestrian conflicts. Such pedestrians claim that they have the right of way. In such cases it seems that we have to deal with uneducated pedestrians and/or pedestrians with bad habits and/or negative attitudes.

- In many cases it seems that adults/parents are guilty by setting wrong examples.

All collisions take place in the road environment. Although the contribution of the road environment, per sé, is relatively small, the lack of facilities and the inability of pedestrians, as well as the skill of drivers, to adapt to specific road environment situations, are
unfortunately a major contributing factor to collisions. It is estimated that there are more than five thousand high risk and potentially high risk road sections/areas/locations in South Africa which need attention[5]. These places include areas where pedestrian collisions occur. According to Dr Ribbens of the CSIR, specific road sections/areas/locations country wide, where a high concentration of pedestrian accidents do occur, should receive urgent attention.

Statistics published by the South African Police Services in 2001 indicated that more than 235 pedestrians were killed in December 2000 on South African roads. In December 2000 at least 3 intoxicated pedestrians were killed in urban, areas while 7 intoxicated pedestrians were killed in rural areas during the same period. Fatalities were the highest in the age groups 25 to 30 years. On average 12.5% of those killed were intoxicated The contributory factors can range from jaywalking to ignorance or deliberately ignoring traffic control, namely. traffic lights or even skipping red lights in crossings It was, however, recorded that at least 81 pedestrians were killed while jaywalking in urban areas. This figure increases to 119 pedestrians who were killed in rural areas, while jaywalking on freeways and highways.

WAYS AND MEANS TO ADDRESS THIS TRAGIC SITUATION

It is evident that it cannot be expected from a Traffic Safety Manager to address the prevailing living conditions of lower income groups. The answer to counter the high incidence of fatalities could, however, be addressed. The only way to address this problem is to identify pedestrian hazardous locations, to study them, consult the community to apply engineering solutions like footbridges, to erect middle block pedestrian crossings between hazardous intersections, to erect medians where inadequate provision for passenger loading and off loading exist and to adjust the posted speed. Enforcement of illegal jaywalking on freeways should be pursued. In signalised intersections the erection of pedestrian barriers or other chanalizing aids should be investigated. Law enforcement should be focusing on high risk areas where pedestrian violations are high.

A MULTI DISCIPLINARY AND SYSTEMS MANAGEMENT APPROACH

I believe it is common knowledge that all concerned with traffic safety related issues are aware that traffic safety is not a discipline in its own right but a science comprising a number of disciplines and functional areas. Four prominent disciplines to manage traffic safety issues have been identified, namely the road environment (engineering), the need to control and regulate (law enforcement) pedestrian units in the road environment, the need to provide units with knowledge and skills, to develop positive attitudes (education) and to undertake research activities (logistical support) with a view to provide the authorities with information. Other relevant aspects are the role of rescue practitioners to manage all types of incidents on the road and the role of the courts.

To accommodate the multi faceted components of traffic safety, the approach that traffic safety issues need to be managed systematically, has been addressed since 1988 in South Africa. The National Department of Transport appointed a National Task Force to develop a Holistic Integrated Traffic Management System (TMS)[1]. The National Task Force, identified a number of disciplines, functional areas, systems and sub systems for target groups as part of the TMS. The TMS are displayed conceptually in Figure 3. To have a clear understanding of the role of pedestrians in the TMS the position of the pedestrian unit needs to be explained. From Figure 3 it can be deducted that the TMS comprises three components. The first component is the physical component which comprises all the elements of the system, namely road users, vehicles, road sections and goods. The second
component comprises a number of integrated units. These include amongst others pedestrian, driver, parking, taxi, passenger and, goods units. The pedestrian unit has two elements, namely a road user and a road section. The third component is the management component. The management component comprises a management model which functions on three levels, namely a road user level, an operational level and an analytical level.

The management model is supported by the four disciplines, a number of functional areas, policy view points[6,7,8], sub management systems and implementation strategies. To function effectively each discipline, functional area and sub management system needs a set of tools. For example, roads are designed according to geometric design standards. Apart from the Road Traffic Act as a tool”, traffic law enforcers need equipment such as enforcement vehicles, speed measuring apparatus, alcohol metres, safety jackets, etc. To provide road users with knowledge and skills, qualified educationists should be available.

ROAD TRAFFIC MANAGEMENT STRATEGY

The Business Plan to implement the road traffic management strategy of the National Department of Transport makes provision for a large number of traffic safety issues to be addressed. With regard to pedestrians, provision has been made for traffic education programmes, research to identify contributing factors and the development of training manuals for adult pedestrians on the safe usage of the transport infrastructure. Although the role of law enforcement regarding pedestrian units is not mentioned explicitly, pedestrian law enforcement activities can be included in the activities of traffic and municipal police officers [10]. The aim of the traffic management strategy is to reduce road traffic fatalities resulting from road traffic accidents by at least 5% compared with the same period the previous year and to reduce critical offences, namely those offences contributing to the occurrence of accidents by 5%. The latter offences refer to excessive speed, drinking and driving, driver and vehicle fitness aspects, etc. .

THE HOLISTIC TRAFFIC MANAGEMENT APPROACH

To really understand his/her role, some managers would have to realign their view on management. The Traffic Safety Manager’s mind needs to be re-adjusted to have a clear understanding what is meant by a holistic, integrated management approach.

TRAINING TRAFFIC SAFETY MANAGERS

After a symposium on road traffic safety held in 1995, the National Department of Transport designed a Road Traffic Management System to manage road traffic safety. The focus also shifted to the management of road traffic safety as an integral part of the training in Road Safety in Southern Africa. A situation analysis of the training of traffic safety managers in the USA during 1988/89 revealed that traffic safety was not managed in a coordinated fashion and the respondents admitted that it posed a problem The need for a formal qualification was seen as crucial for the training of traffic safety managers and to address the problems of traffic safety in South Africa. At an international SORIC conference on Safety on Roads[3] held in Bahrain, during October 1998, a resolution was taken that an international curriculum to train Traffic Safety Managers, should be developed as soon as possible.

Since road traffic safety theory extends over many disciplines, few of which are based on the common assumptions and knowledge of traffic safety, it is imperative that the Traffic Safety Manager of today and even more, the Traffic Safety Manager of the future should be
equipped with skills, knowledge, and attitudes to manage traffic safety effectively. In order to enhance his or her ability to manage traffic safety effectively, potential managers should be exposed to all the various disciplines that are part and parcel of the traffic safety environment, to develop a holistic approach towards traffic safety. In the past road traffic safety was implemented by different professions, few of which consult and cooperate with each other. In some places it still is the case presently.

Pretorius[5] and Pretorius & Mulder[1] identified the need for a new occupational group to undertake and manage the traffic practitioners’ functions. The main aim of such an occupation would be to play a coordinated, integrated role between road users and role players from the various disciplines and functional areas. In other words, there is a need that someone should manage the development, implementation and operation of traffic management strategies and plans, based on related policies.

A new post graduate degree in Traffic Safety Management has been developed in South Africa to address training and development needs in Traffic Safety Management on an integrated basis. Although a drastic reduction of pedestrian fatalities on South African roads cannot be claimed at this stage, it is envisaged that the focus on the various functional areas would equip the Traffic Safety Manager with sufficient outcomes based skills to enhance road safety management.

The subject which focuses on pedestrian management plans is Traffic Safety Systems. This is the compulsory major subject which was included to empower the student in interpreting data, developing pedestrian management and speed management programs and plans for the protection of other vulnerable road users. The Traffic Safety Manager should, after completion of this subject be able to manage road traffic comprehensively, while special is given to the design, development and implementation of pedestrian safety management plans.
Figure 3: Conceptualisation of the Traffic Management System

TRAFFIC MANAGEMENT SYSTEM

Physical component
- Road sections
- Road
- Vehicles
- Goods

Unit component
- Pedestrian unit
  - Pedestrian management
  - Incident
  - Alcohol and other drugs
  - Speed management

Management Component
- Road user level
- Operational
- Analytical level

Disciplines and Functional areas
- ENGINEERING
  (Road environment)
- EDUCATION
  (Traffic Safety Education)
  (Marketing)
  (Driver training)
- LAW ENFORCEMENT
  (Legislation)
  (Traffic policing)
  (Adjudication)
- LOGISTICAL SUPPORT
  (Research et al)
  (Administration)
  (Traffic information)
  (Emergency services)

Implementation strategies
- National, provincial, regional and local road traffic management strategies. Business management plans. Operational plans and audits

Policy viewpoints
Figure 4 Components of pedestrian management plan

COMPONENTS OF PEDESTRIAN MANAGEMENT PLAN

OVERALL TRAFFIC MANAGEMENT STRATEGY

Pedestrian Management Strategy

Vision
Mission
Goals
Objectives

ENGINEERING
EDUCATION
LAW ENFORCEMENT
LOGISTICAL
SUPPORT
Evaluation
Monitoring

PROGRAMMES
PROJECTS

IMPLEMENTATION PROCESS

Initiation
Evaluation
Operationalisation

 Organisation development

Gap and bridge

Existing bridge
Altered bridge
Extended bridge

Stress and trauma

FUTURE

PAST

FUTURISTIC MODELLING

Scenario analysis
PESTAI MODELLING

Political
Economical
Social
Technology
Industry
Agricultural

Positive
Negative

Audits

Traffic Safety management Audit

Road Safety Audit
Hazardous locations

Statistical Audits
Accident analysis
DEVELOPING PEDESTRIAN MANAGEMENT PLANS

To be able to manage the pedestrian unit a Traffic Safety Manager should be trained to:

- identify the need for pedestrian facilities;
- determine the role of the Traffic Engineer in pedestrian management;
- contribute to and manage pedestrian education by
  - determining the role of the parents, teachers and community committees and
  - equipping pedestrians with knowledge skills and values;
- manage traffic law enforcement activities in areas where illegal pedestrian activities occur;
- monitor pedestrian violation rates;
- manage accident data; and
- interpret research findings.

The Traffic Safety Manager should be able to analyse the pedestrian situation, develop and implement a pedestrian management plans in terms of the overall management plan for his or her area of jurisdiction and thus comply with the national strategy. This would also include revision of and the updating of such plans. In order to identify the needs of the pedestrian unit a Traffic Manager should be able to supervise the execution of components of the pedestrian plan and strategy.

In order to determine the problem, the primary objective should be to conduct audits of the current situation. These audits could form the basis from which a subsequent pedestrian development plan will evolve. The manager could then, from this information, constitute the strategy. Three audits could be conducted to determine the status quo, namely a traffic safety management audit, a road safety audit and a statistical audit. The main aim of the traffic safety management audit is to evaluate to what extent criteria to manage traffic safety issues effectively are met, and whether pedestrian units are receiving sufficient attention. The main aim of a road safety audit is to assess the quality and safety of the road environment. If feasible, a selected audit to assess pedestrian related road safety issues could also be executed. A statistical audit is undertaken to analyse pedestrian collisions. Pedestrian data/information can also be gathered by means of a statistical sampling plan to monitor pedestrian violation rates (quality control) and pedestrian volumes/capacities.

Making use of the results from the audit a framework for a pedestrian management strategy should be developed. The implementation of a pedestrian management plan relies heavily on the coordinated action and cooperation between the various authorities, as well as public/private partnerships.

SCENARIO ANALYSIS

Traffic Safety Managers are trained to develop a scenario analysis by adopting a model known as the PESTAI-model. This model comprises political, economical, social, technological, agricultural and industrial issues. The model should be supported by a futuristic model, based on data/information of the past (also known as FACTA) and futuristic issues (also known as FUTURA). The FACTA-part relates to facts of a historical nature and the FUTURA-part to future scenarios. Futuristic modelling includes four clearly defined periods, namely a short-, medium-, long-term and a period longer than 20 years.
DEVELOPMENT OF TRAFFIC SAFETY MANAGEMENT PLANS

Once the abovementioned exercises have been performed, an overall traffic management plan and strategy could be developed. Strategies to manage pedestrian units could form part of the overall strategy, or if justified a separate pedestrian management plan and strategy could be developed. If one assumes that a separate plan is justified, the question would be: What should be included in such a plan? The answer to this question is not so easy because the need differs from place to place. The pedestrian management plan should include the results of the audits; the scenario analysis; a futuristic model; a vision; a mission; a main or general goal; objectives; programmes; projects; details on the implementation plan/process; organisational developments; and a stress management plan.

In a recent study in the Western Cape Province in 2000 audits comprised activities such as accident analysis and identification of the 50 most hazardous sites, site inspections and surveys of the 50 sites, school interviews and visits, as well as, conclusions and recommendations. Some of the conclusions are:

- **Road environment(engineering).**
  - With informal settlements spreading at a rapidly increasing rate, provision should be made in budgets for the provision of pedestrian facilities at these sites.

- **Pedestrian safety education.**
  - Pedestrian safety education has not been adequately addressed in schools. Many schools were not aware of the programmes and material available. Too few schools had scholar patrols. The Department of Education should be more involved and actively assist with the inclusion of pedestrian safety education in the curriculum.

- **Law enforcement.**
  - Pedestrian crossings discipline was poor throughout the Province. Law enforcement should be increased to address pedestrian offences. Education programmes on correct crossings behaviour should be intensified.

- **Information management.**
  - Generally, pedestrian accident and casualty information was of poor quality. Hazardous locations could not be properly identified from the available data. Although 45 per cent of pedestrian fatalities occur on rural roads, relatively few hazardous locations could be identified on these roads. Quality checks should be implemented during data collection and capturing.

The implementation process comprises three stages, namely to initiate the implementation process, to evaluate the implementation process, and get the plan operational.

**CONCLUSION**

The demand to regulate and control pedestrian units is higher than we realise. In South Africa we are serious in our efforts to reduce pedestrian fatalities to an acceptable level as stipulated by the business plan and traffic management strategy of the National Department of Transport. In this case South African road safety authorities have no choice but to accept the new paradigm shift in Traffic Safety Management. That implies that all role players need to work together in a holistic and integrated manner. A well trained Traffic Safety Manager would be able to deliver effective service which could enhance traffic safety, save lives of pedestrians.
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