

A HOLISTIC APPROACH TO THE CREATION OF A SAFE ROAD ENVIRONMENT FOR ROAD USERS ON NATIONAL ROADS: A CASE STUDY

Ms P N MOEKETSI

CSIR, Transportek, P O Box 395, Pretoria, 0001

INTRODUCTION

Road traffic accident statistics available from the early sixties show that pedestrian fatalities have always formed a significant part of road traffic fatalities in South Africa. Over these years, the number of pedestrian fatalities, expressed as a proportion of all road fatalities, varied between 38 and 48 per cent. Apart from the 3 500 pedestrians being killed on South Africa's roads annually, another 10 000 pedestrians are seriously injured, while another 18 000 sustain minor injuries. Road traffic fatalities and injuries among pedestrians in specific age groups tend to feature prominently in road traffic statistics.

The scenario above is exacerbated by the proliferation of formal and informal settlements adjacent to national roads, which has generated intense pedestrian activity with concomitant negative impacts on their safety levels. These communities make use of national roads to access schools, work places, shops, etc. In addition, given the scarcity of employment opportunities in the mainstream economy, they often engage in small business activities along the national roads to make ends meet... Inevitably, some of these activities could be deemed illegal under the traffic act. However, for most community members the need to make a living takes precedence over legal issues.

Traffic accidents have been recognized as one of the major causes for human and economic losses in both developed and developing countries. This problem is of greater concern in developing countries such as South Africa largely because of limited resources to develop the necessary countermeasure regime to effect a reduction in the accident situation. On the other hand, developed countries have designed and implemented different strategies to reduce the scale and severity of this problem through education, enforcement and engineering. Research results in the United States, Europe, and Australia have consistently proved that highway and traffic engineering countermeasures can be highly cost effective and easy to implement (Berhanu, 2000).

In view of the foregoing, the South African National Roads Agency Limited [SANRAL], an institution responsible for the construction and maintenance of national roads in South Africa, has over the years become acutely aware of the need not to concentrate only on the engineering aspects of these national assets, but also to endeavour to create safer environments for road users along national roads. SANRAL engaged CSIR: Transportek's Traffic Management Programme to design a holistic road safety regime for national roads anchored on education and enforcement and supported by engineering measures.

The central theme in CSIR: Transportek's approach is to actively involve the community in all facets of the project with a view to introducing higher levels of safety in the project environments. This is in line with international trends of taking road safety issues back to the communities. It also encourages ownership of specific project processes and deliverables.

The project, which is in its first year of a three year cycle, has the following phases: identification of project sites, making contact and getting to know the communities, needs assessment, prioritization of action plans, implementation of the three E's of road safety and evaluation. Project sites are at different levels of task completion.

GEOGRAPHICAL FOCUS OF THE PROJECT

The planning of land use, the safe layout and design of the road and street system, and the application of proved traffic management techniques are among the most effective approaches for improving road safety (Expert group on Road Safety: 1977). However, in South Africa, the system "has not been used to its full potential i.e., of creating better places and better people. It has instead been used mostly to discriminate..." (Mpondo, 1999). Hence, the existence of communities who locate in very close proximity to national roads in search of better economic opportunities has increased.

In some cases the construction of national roads come long after the communities have established themselves in certain areas. This can be clearly seen in the case of the Lubombo Spatial Development Initiative (LSDI) road which has brought both economic opportunities and safety problems for the rural communities through which this road passes.

On the other hand, it is acknowledged that hazardous locations have always been present on road networks causing injuries and even death to road users. These locations can be detected through the collection and analysis of relevant data. The interpretation of the data collected by SANRAL over the years has provided information needed to assess sites that pose problems to road users and find solutions to the problems.

Site selection and verification were done through numerous visits (observation of communities on how they interact with the road environment) by the project teams from both the CSIR and SANRAL. A number of possible engineering measures were identified. However, it was agreed that before these measures could be put in place, there was need to extensively consult with the proposed beneficiary communities. The main reason for the approach was to ensure that the measures are acceptable to the communities and their respective authorities. In addition, it was envisaged that this would also help communities gain a clearer understanding of why one measure is more cost effective than others.

Six of the nine provinces in South Africa are involved in the project. These are indicated in Table 1.1 and figure 1.1 below.

Table 1.1 Project Study Areas

Study Area	Region	National Route	Detail
1	Eastern	Lubombo Spatial Development Initiative (N2)	Hlabisa (KwaMsane, Nyalazi Market, St Lucia) Ubombo (Makhasa, Mnqobokazi, Mbazwaza) Ingwavuma Ngotshe KwaMbonambi
		N2 North	Lower Umfolozi Kew
		N2N Toll	Mtunzini Lower Tugela
		N2 South	Umbumbulu
		N2 Harding	Port Shepstone Alfred
		N2 Kokstad	<ul style="list-style-type: none"> • Kokstad
2	Eastern	N1 Bloemfontein	<ul style="list-style-type: none"> • Welkom/Winberg • Kroonstad • Ventersburg
		N1 Cape Bloemfontein –	<ul style="list-style-type: none"> • Bethuli/O-rivier
		N6 Free State	<ul style="list-style-type: none"> • Rouxville • Smithfield
		N8	<ul style="list-style-type: none"> • Bloemfontein • Petrosburg
3	Northern	N1 Gauteng	<ul style="list-style-type: none"> • Hammanskraal
4	Northern	N4 Witbank	<ul style="list-style-type: none"> • Witbank • Clewer interchange • Wonderfontein
5	Northern	N1 Northern Province	<ul style="list-style-type: none"> • Botlokwa
6	Southern	N1 Western Cape	<ul style="list-style-type: none"> • Leeu-Gamka • De Doorns

The geographical locations of the study areas (indicated in Table 1.1), in relation to the national road network (i.e. that managed by SANRAL) are shown in Figure 1.1 below.

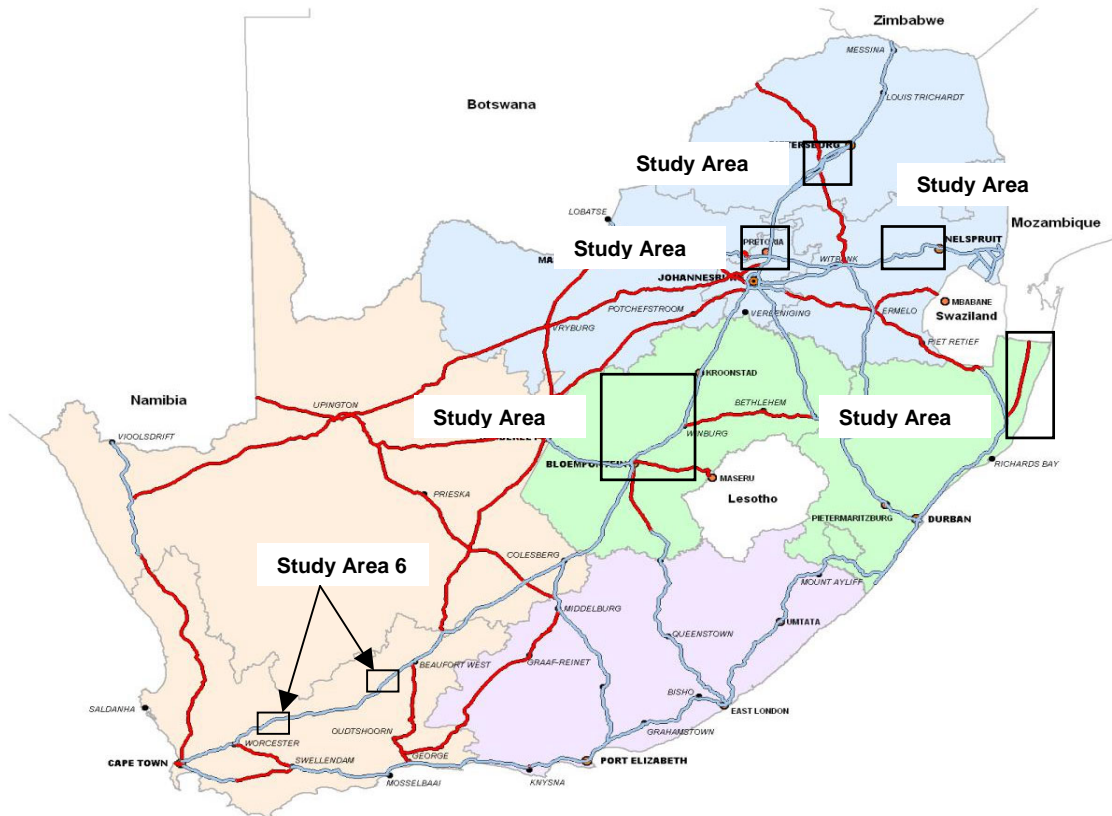


Figure 1.1 Geographical locations of study areas and national route network

COMMUNITY INVOLVEMENT

SANRAL has adopted a two-pronged approach to the upgrading of the national road network, namely, to realise sustained economic development in an area, it is important not only to develop and maintain an adequate level of infrastructure, but also to facilitate, foster and create an environment in which communities can develop in a sustainable way (Page, et. al: 2002). This directive by SANRAL arose in part, because of the link between poverty and road safety, i.e. the least educated/resourced communities are often the most vulnerable to road accidents (ibid). SANRAL, as the managers of the South African national road network, has accepted that, through the empowerment of rural communities which border national roads by for example, road safety education programmes accident reduction benefits are likely to be realised. The potential positive impact of road safety education on poverty alleviation is summed up in Figure 1.2.

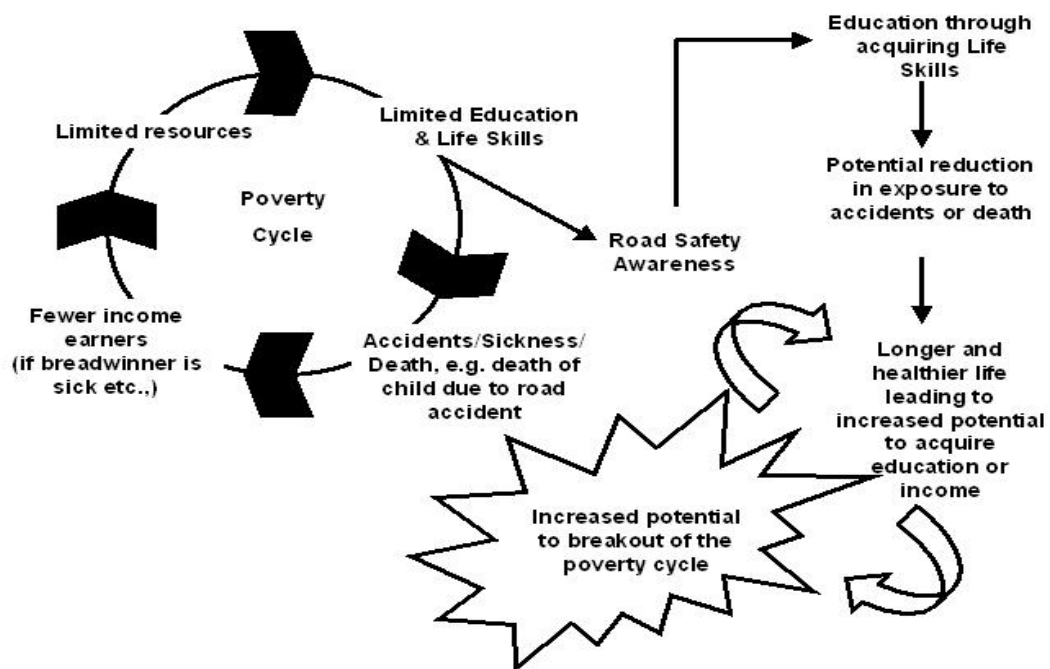


Figure 1.1 Cycle of poverty and potential impact of Road Safety Education (Page, et.al. 2002).

Community development principles were followed to make contact and to build trust between communities and their leaders, as well as implementers with a view to bringing everyone onboard. Although the community consultation process was long and time consuming, it has proved to be effective as evidenced by the relatively smooth running of the project to date.

NEEDS ASSESSMENT IN COMMUNITIES

SANRAL is working on a program to detect and remove road hazards by conducting safety assessment along national routes. Needs assessments were done with various communities and stakeholders and some of the problems already identified were confirmed. The research team used various methods to collect baseline data, e.g., household surveys, participatory techniques, mobility mapping – especially for school children, accident data and observation of behaviour at project sites. The involvement of communities and target groups (e.g. hawkers) in problem identification and planning of the process has been very crucial as they were actively involved in identifying solutions.

Some of the problems identified are:

- Very high operating speeds along roads managed by SANRAL;
- Regular crossing [and sometimes jay walking] of national highways by pedestrians;
- Poor sight distances for pedestrians at the point of crossing;
- Poor visibility of pedestrians especially at dawn and dusk;
- Intoxicated pedestrians crossing national highways;
- High unemployment rate and impoverished communities (in the rural areas bordering the national highways);
- Lack of facilities for informal traders at certain points along the national highways;

- Inadequate maintenance (at certain locations) of the road reserve and/or road verges, e.g. tall grasses obscuring oncoming vehicles and broken fences allowing cattle and other domestic animals to stray on the national highways.
- Ineffective control of road traffic – [e.g. ineffective rumble strips]
- Lack of law enforcement (speed limits not enforced to prevent dangerous infringements)
- Very bad traffic participants behaviour and discipline
- Communities not actively involved in discussing road traffic safety problems affecting them
- Increase in the volume of traffic
- Lack of coordinated land use and transport planning
- Drivers' lack of discipline
- Inadequate pedestrian facilities
- Inadequate vehicle safety standards

IMPLEMENTATION OF VARIOUS PROGRAMMES

Reducing unemployment is one of the greatest challenges facing South Africa. Government has undertaken a number of initiatives to address unemployment and poverty, including the promotion of labour-intensive Special Public Works Programmes (SPWP). A SPWP is a short-term, non-permanent, labour intensive programme initiated by government and funded, either fully or partially, from public resources to create a public asset (Department of Labour, 2002).

SANRAL accessed poverty alleviation funds, which are meant to target female-headed households, youth and people with disabilities. The main objective is the empowerment of individuals and communities engaged in SPWP through the provision of training. Hence, the project has engaged emerging contractors, Non Government and Community Based Organisations to give assistance in the implementation of different programme, i.e., infrastructure development and education programmes. A large proportion of the project funds will benefit the communities - through infrastructure development - and income earning individuals.

Engineering measures

Usually solutions to alleviate the conditions at hazardous locations are inexpensive (e.g. changes to road markings, improved signing, revised traffic signal settings, improved traffic control at intersections, pedestrian control measures, measures against stray animals, etc.), and if properly prioritized, could be financially very effective.

Specific problems from different communities were prioritized and funds allocated depending on the cost effectiveness of the measures. Some of the solutions to the identified problems are:

- Construction of pedestrian bridges
- Construction of bus/taxi pick up points
- Construction of formal road side markets to serve passing tourist and local traffic
- Service roads and formal access roads to national roads
- Pedestrian facilities along national roads
- Reduction of speed limit and traffic calming measures on the stretch of national roads with high pedestrian activity
- Improvements in land use planning and these were linked to the Integrated Development Plans (in municipalities where the said documents were available).

The level of progress at the different sites varies. Some of the above-mentioned projects have already commenced, e.g., the construction of a pedestrian bridge in Hammanskraal, formal road side markets in Hlabisa, construction of access roads, commuter pick up points in Gumbi.

Road Safety Education

It is necessary to raise the level of awareness in the community and to create a social climate more conducive to effective action. Educational programmes are undertaken to overcome existing areas of ignorance and to initiate a process of social change.

Through the emphasis on sustainable Road Safety Education, the aim is to *facilitate the adequate transfer of skills and knowledge to ensure that projects of this nature can be continued in the future using local resources*. The CSIR, Traffic Management Programme has developed modules that:

- Provide education to relevant target groups on the ABC of road safety
- Share information on the economic costs of road accidents
- Provide training regarding the usage of pedestrian facilities and their importance
- Provide training on the safe use of the commuter pick-up points and their importance
- Increase awareness on substance abuse and its impact on road safety
- Expose schoolchildren to appropriate road user behaviour
- Engage the public transport providers in driver education programmes
- Increase awareness on social marketing models

Law Enforcement

Driving and/or walking under the influence of alcohol and or drugs is still one of the important contributing factors in road accidents. In some communities, the steps already taken to reduce the magnitude of the problem have been insufficient and ineffective. Comprehensive countermeasures must be implemented and these should include education of the public and visible law enforcement. The latter has seemed impossible due to lack of human and financial resources.

The prevalence of crime on some of the national routes, e.g., car hijackings, seem to be a common feature. There is therefore a need to make the general public aware of such occurrences and measures that can be employed to reduce the incidences. A good example is the facilitation of the formation of traders against crime (involving local traders and hawkers) who will work closely with the law enforcement agencies.

Evaluation

One of the conditions to access the poverty alleviation funds is for the implementers to ensure that these government-initiated programmes, which are funded from public resources are efficient and effective. Therefore, pre- and post-impact studies are conducted to determine the overall impact of the various implemented programmes (engineering and education). This is an ongoing process until the completion of the project.

CONCLUSION

Fostering a culture of safety among communities living along national roads is a daunting and complex exercise for many reasons the most critical of which is the need to meaningfully respond to the question as to what is in it for these communities. SANRAL in conjunction with the CSIR has adopted a two-pronged approach that on the one hand seeks to develop and maintain an adequate level of infrastructure [and thereby

substantially improving safety], and on the other, rewards the community [for assimilating and taking up safety issues] by facilitating, creating and fostering an environment in which the community can socio-economically thrive.

Thus SANRAL seeks to positively contribute to the strategic objective of the “Road to Safety 2001 – 2005”, which aims “to reduce crashes, deaths and injuries on South Africa’s roads by 5% year-on-year until the year 2005 – at a saving to the economy of R770 million per annum” with this and other initiatives. The emphasis is on a holistic approach to solving road safety problems.

REFERENCES

- Berhanu G. **Predictive models relating traffic safety with street design and traffic flows in Addis Ababa.** Paper presented at a conference on road safety on three continents. 20 - 22 September 2000. Pretoria.
- Department of Labour. 2002. **Code of Good Practice for employment and conditions of work for Special Public Works Programmes,** Government Gazette, 25 January 2002.
- Expert Group on Road Safety. 1977. **The Road Accident Situation in Australia in 1975.** A report to the Commonwealth Minister for Transport. Canberra
- Mpondo, B. 1999. **Towards a flexible and integrated land use management system with an emphasis on public involvement.** A discourse submitted to the Faculty of Built Environment, University of the Witwatersrand. Johannesburg
- Page, O; Nkosi, S; Moeketsi, P; Vermaak, L; van Niekerk E; & Magolego, S. 2002. **Poverty Alleviation Impacts of National Roads Construction Projects.** Progress Report. CSIR, Pretoria.

A HOLISTIC APPROACH TO THE CREATION OF A SAFE ROAD ENVIRONMENT FOR ROAD USERS ON NATIONAL ROADS: A CASE STUDY

Ms P N MOEKETSI

CSIR, Transportek, P O Box 395, Pretoria, 0001

CURRICULUM VITAE

P N Moeketsi, RN, RM, BEcon (Hon)

NAME	PRUDENCE NKOSAZANA MOEKETSI
NATIONALITY	South African
PROFESSION	Health and Safety Specialist
POSITION IN ORG.	Manager: Safety Research and Education
YEARS WITH ORG.	Since 1998
EDUCATION	Natalspruit College of Nursing Diploma in Nursing Science (1987) Diploma in Midwifery – with distinction (1988) Rhodes University Bachelor of Economics Honours 1997 Stratek Technology Leadership Programme – 2001

CURRENT KEY COMPETENCE AREAS

Public Transport Safety; Rural Transport and Development; Injury Prevention and Control; AIDS in the transport industry.

Prudence started her career in the nursing field. In the early nineties, she decided on a career change and did an Honours degree in Economics at Rhodes University, in Grahamstown. On successful completion of her studies, she was subsequently employed by Rhodes University as a junior lecturer in Economics, a post she held for two years.

In April 1998, she joined the CSIR, Transportek as a researcher in the Traffic Management Programme. Currently she is holding a management position in the area Safety Research and Education.