

# TOWARDS ESTABLISHING A RELIABLE ACCIDENT DATA SYSTEM IN GHANA

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## ABSTRACT

From the late sixties to the mid-eighties the Building and Road Research Institute (BRI) pursued accident data collection only for routine research activities. This approach did not help very much in providing an indication of the magnitude of the road accident problem in Ghana. However, following the establishment of the Ghana Road Safety Project (GRSP) in 1987, as part of the government's Transport Rehabilitation Programme, accident data collection and analysis was institutionalised to provide data to support the development of countermeasures by the National Road Safety Commission (NRSC) and the road agencies. The achievements so far have been due to the collaboration between the BRI and the Transport Research Laboratory (TRL) of the United Kingdom, under the Ghana Road Safety Project. The collaboration has provided vital support to the BRI in the form of technical expertise, establishment of the Accident Data Analysis Unit and staff training. This paper presents some of the achievements made by the Accident Data Analysis Unit since its creation and suggests actions that could be taken to improve road safety.

**Keywords:** Road safety, Accident data analysis unit, Building and Road Research Institute, Transport Research Laboratory, Ghana Road Safety Project, Micro-Computer Accident Analysis Package

## 1. INTRODUCTION

### 1.1 Background

Without a reliable and accurate database, effective and meaningful work at improving road safety is difficult. This fact was one of the main focuses of the Building and Road Research Institute (BRI) during the period from late sixties to the mid eighties when it was engaged in accident data collection for research purposes. During that period, the only information on the accident situation in Ghana was the summary statistics collated by the police for the information of the general public. The statistics were generally unreliable and greatly affected the success and effectiveness of road safety improvement programmes.

### 1.2 The Ghana Road Safety Project (GRSP)

The establishment in 1987 of the Ghana Road Safety Project (GRSP) as part of the Transport Rehabilitation/Urban Transport Project by the Ghana Government with support from the World Bank was timely. The most important component of the GRSP was the establishment of a new accident data collection, storage and analysis system for Ghana and the training of an accident analysis unit at the Building and Road Research Institute (BRI). This has enabled road safety activities to become institutionalised to provide data-based support to accident remedial activities pursued by the National Road Safety Commission (NRSC) and other governmental agencies working in this field.

The realization of the objectives of the GRSP was largely due to the immense technical support received from the British Overseas Aid through the Overseas Unit of the Transport Research Laboratory (TRL). The aid made available to Ghana at no cost a microcom-

puter-based programme designed for accident analysis in developing countries.

## 2 THE NEW ACCIDENT DATA SYSTEM CREATED UNDER THE GRSP

Before the establishment of the GRSP, practical work towards road safety improvement in Ghana was not encouraging. This was mainly due to the fact that a system for data collection, storage and analysis did not exist, but such a system is crucial to the understanding of the nature and characteristics of accident problems as well as the selection, monitoring and evaluation of the appropriate counter-measures. Due to time and financial constraints it was not feasible, within the context of the GRSP, to develop and test an accident data system suited to the needs of the country from scratch. Therefore it became necessary to look for other options

### 2.1 Involvement of the Transport Research Laboratory (TRL)

The Overseas Unit of the Transport Research Laboratory developed the Microcomputer Accident Analysis Package (MAAP) to address the inadequacies in accident data recording in developing countries, and the negative impact the situation was having on road safety in such countries. The package is a low-cost easy-to-use system with flexibility in its format, which enables the programmes to be adapted to meet the specific needs and conditions of any particular country (Hills *et al*, 1987). The system consists of eight computer programmes, four of which are dedicated to the storage and retrieval of accident data and four to the analysis of stored data. The system is able to undertake various types of analysis that make it possible for the

character and nature of the road safety problem to be properly evaluated.

The main features of the MAAP are:

- cross tabulations capabilities
- link and node analysis
- blackspots listing and analysis
- stick diagram analysis

The MAAP has been tried and tested in other countries and found to be a very convenient and flexible system hence it was installed at the Building and Road Research Institute in Kumasi and an Accident Analysis Unit was set up to support it.

**2.2 Accident Data Collection - The New Accident Report Form**

As part of the establishment of the new accident system a new accident data collection form, was designed by the GRSP team in consultation with the BRR I and the Police. The form is easy to complete and, in most cases, only requires the police to select the option applicable to the situation from a number of alternatives. It contains information about the accident site location, the vehicles and persons involved and the circumstances leading to the accident and location of the accident. The form is designed to be filled in duplicate, one copy of which is to be retained by the police for prosecution, and the other to be sent to the BRR I Accident Analysis Unit.

Before the new accident collection form could be introduced countrywide, the BRR I had to ‘backcode’ data for 1988 onto the new forms to use in the training of personnel of the Motor Transport and Traffic Unit (MTTU) of the police service in handling the forms. At the end of every month, Regional Police Commanders are to send copies of completed forms to the headquarters of the National Road Safety Commission and the BRR I for storage and analysis through the Police Headquarters in Accra. The data transfer matrix in Figure 1 shows how accident data collected from the districts in every region reaches the Accident Analysis Unit at the BRR I

**2.3 Data Storage - Location Systems.**

To make it possible to analyse and plot accident blackspots, it was necessary to convert street networks into coded networks for entry into the computer. A series of code numbers have been devised for the road network in each region or city such that the road configuration could be represented via a numerical code. Each junction becomes a ‘node’ and is allocated a unique number. The section of road between nodes (called a link) is uniquely defined by specifying the nodes at each end. Figure 2 (a) shows a particular configuration of streets and Figure 2 (b) shows how this

road system can be converted into a simple node-link network for use in accident location coding.



Fig.1 Accident Data Transfer Matrix.

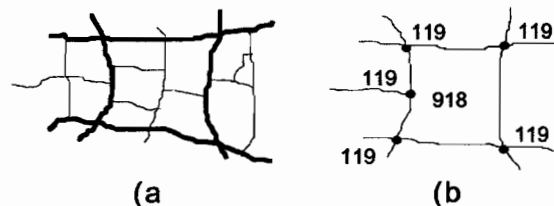


Figure 2. Conversion of a street system to a coded network.

In this way an accident location can be converted by the use of the coded node-link network into a numeric description for computerised analysis (Silcock, 1989). Available maps and plans for the major urban areas of Ghana were obtained from the Survey Department in Accra for use with the accident system. For inter-urban roads, maps were obtained from the Ghana Highway Authority and used to prepare ‘strip maps’ which present the highway as a straight line with kilometer posts and important physical features indicated along it.

Each accident is stored as a single record with length dependent on the number of vehicles, passengers and pedestrians involved. The programmes automatically request the data in numerical sequence and display the valid values which are acceptable and reject invalid values and combinations. Data can be coded up directly from the form in most instances. Where this is not possible, the coding manual (Silcock, 1989) is

used to provide the appropriate code.

### 3. THE ROLE AND ACHIEVEMENTS OF THE ACCIDENT DATA ANALYSIS UNIT

With the installation of the MAAP system on its own microcomputers and the gradual build-up of accident data, the BRRi is in a position now than before to conduct meaningful research in Ghana. It is expected that the establishment of the Accident Analysis Unit would facilitate and improve the BRRi's links with all stakeholders in the area of road safety and enable useful research information to become available to all parties (see Figure 3).

So far the establishment of the Accident Analysis Unit has made it possible for credible national accident data base to be established and a number of workshops on Accident Blackspots identification and analysis to be organized for the Ghana Highway Authority, the Department of Urban Roads, the Police and planners. In addition, a number of remedial interventions have been undertaken by the BRRi most of which have already achieved significant reductions in accidents at some specific locations.

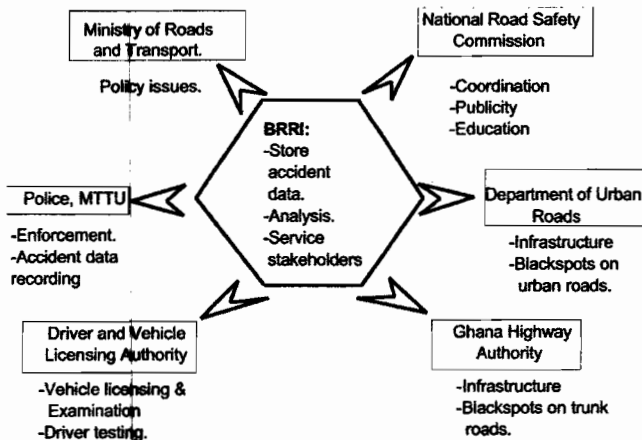


Fig.3 The BRRi's Link with Stakeholders.

### 4. SETBACKS

With the successful introduction of the new accident report form to the police, it was expected the police would eventually absorb the forms into their record system and use them for accident reporting but this has not happened. As a result, BRRi staff have to travel to the regional and district police offices country-wide to transfer accident data from police dockets onto the accident forms for processing at the accident unit. This has already affected the expected frequency of data transfer from the regions and leads to shortfalls in collated data annually. Notwithstanding these limitations, population based surveys have generally validated the essential characteristics of the accident records.

### 5. SUGGESTIONS FOR IMPROVEMENT

The difficulties mentioned above suggests the need to deal with road traffic and associated safety problems. The present establishment which makes every policeman/woman a traffic personnel is not at all helpful. Apart from the fact that a traffic police force will have the unique responsibility of handling all aspects of motor traffic, the advantages of establishing such a body are numerous in the light of worsening safety on our roads.

The police and other allied institutions which have the responsibility for enforcement, testing and training of drivers are often poorly equipped and generally lack the expertise to do the work required of them. Such institutions must be adequately equipped and resourced if they are to make an impact on road safety improvements. The BRRi and allied institutions should continue to seek technical assistance and reliance on the rich expertise from other countries. Such well intended cooperation if properly adapted as indicated in Ghana's GRSP should set the stage for revolutionising road safety improvement works in the country.

### 6 CONCLUSION

The Ghana Road Safety Project has been very worthwhile for the following reasons:

1. It has ensured the establishment of a credible database with the formation of an Accident Analysis Unit for Ghana.
2. It has necessitated research into local accident characteristics as an essential tool in identifying and addressing road safety problems.
3. On this bases the BRRi is now able to advice and influence decisions on policy issues on matters affecting road safety which are of national concern.

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