PREFACE

(a) Scope and Philosophy of Approach

This document outlines the different stages involved in planning and designing road networks and introduces safety conscious design principles so that professionals and decision-makers in developing countries can be given some practical guidance on how to make their road networks safer. Guidance on "Accident Prevention" is given by highlighting the key, safety-related factors which need to be incorporated when planning, designing and operating road networks. Advice is also given on "Accident Reduction" by showing how hazardous locations can be analysed and what types of countermeasures can be used to reduce accidents at such locations.

This Guide draws heavily upon existing geometric and traffic engineering design practices in a number of developing and developed countries. The main reference documents used in preparing the Guide are listed in Appendix A. Extracts have been taken freely from such documents and, where necessary, these have been amended and modified for application in developing countries. Due acknowledgement has been given where substantial portions of text or diagrams were adapted for use in this document but the authors also acknowledge a debt of gratitude to the many other publications consulted during the preparation process.

The document is intended only to highlight the key elements of planning, design and operation of road networks which influence road safety. It is based in part, on the experiences and standards in use in the developed countries and, in part, on the extensive practical experience of a very large number of professionals with direct experience of working and living in developing countries. The Guide does not, therefore, rigorously follow the design standards of the industrialised countries. It draws heavily upon the accumulated knowledge and expertise of professionals with direct practical experience of working on road or traffic related projects in the developing world.

(b) Aims

The general aim of this Guide is the promotion of safer road planning and design practices in developing countries. The specific objectives of the Guide are:

(i) to bring safety to the forefront of the minds of planners and engineers practising in developing countries and to bring to their attention important details of design affecting road safety that they might otherwise overlook or consider insignificant;

(ii) to act as an introduction for policy-makers in developing countries and aid agencies to the wide range of issues in highway planning and design that can affect road accident rates and the mitigating actions which can be taken to reduce the number and severity of road accidents;

(iii) to bring together in a single document the joint experience of the Overseas Unit, TRL and those UK consultants who have had significant developing country experience in road safety and traffic engineering, together with relevant material from standards,
guidelines and design guides of developed countries to act as a first source of information for professionals in developing countries;

(iv) to act as a source of ideas for new designs and countermeasures so that hazardous locations in developing countries can be made safer; and

(v) to stimulate evaluation of and research into road safety countermeasures in developing countries so that the most effective can be identified.

(c) The Need for Guidance and Advice

Since almost all countries of the developing world suffer from lack of financial resources it is essential that the scarce resources which are available are not wasted. Many countries also suffer from absence of adequate technical resources and expertise to ensure that only safe roads are built. The absence of systematic checking of the road safety Implications on new or rehabilitated road networks may be worsening the situation in many countries by increasing the incidence of unsafe roads because additional specific safeguards to overcome the types of operational deficiencies, common in developing countries, are rarely incorporated into the design processes.

Often, too few trained professionals are available. There are often gaps in knowledge and they may not always be familiar with recent developments and techniques. Consequently, there is a need to amalgamate and distil the collective knowledge and experience of the industrialised countries and, particularly, of individuals with extensive experience of working in developing countries to create an easily accessible source of reference and advice on how to overcome existing problems and how to avoid future road safety problems.

(d) Potential Users

This document is intended for use by engineers, planners, traffic police officers and other professionals responsible for road networks in developing countries. It can also act as a basic source of reference for politicians, aid agency officials and other decision-makers so that they are at least familiar with the key elements and constraints relating to the planning, design and operation of highways. Many roads in developing countries would not be built without Aid funding so aid agencies have a particularly heavy responsibility to ensure that such aid-funded roads incorporate the basic safety features outlined in this document. The main principles are summarised and encapsulated in the road safety checklists which are included as Chapter 7.

(e) Structure and Contents

This document consists of a number of parts each containing one or more chapters, followed by a number of Appendices. The Guide is arranged as follows.

PREFACE

The Preface provides a brief guide to the scope and use of the document and discusses its main aims, potential users and structure.
PART I: Introduction (Chapters 1 and 2)

This includes an introduction to the scale and nature of the road safety problem in developing countries. After discussing present practices in developed and developing countries it indicates the lessons which may be learned from the experiences of developed countries. This section then discusses the inter-relationships affecting road safety and the institutional arrangements necessary if the problem is to be tackled effectively in the developing world.

PART II: Planning and Design (Chapters 3 and 4)

This section discusses how accident prevention can be achieved through better planning and design of roads in developing countries. It gives practical advice to planners, engineers and policy-makers on the key elements influencing road safety at each stage of the development cycle. Considerable freedom exists when planning and designing new roads and it may be possible to introduce significant improvements in road safety terms at minimal cost if such issues are given sufficient attention at an early stage.

PART III: Operations and Countermeasures (Chapters 5 and 6)

This section provides advice on accident reduction on existing roads and how this can be achieved through better operation of roads and implementation of low cost countermeasures at locations where abnormally high numbers of accidents occur (i.e. accident blackspots). It includes specific examples of countermeasures and indicates the approaches which may be most suitable for application in the developing world. Such countermeasures are applied to existing roads and consequently normally only involve minimal changes to the basic structure or alignment.

PART IV: Road Safety Checklists (Chapter 7)

This section presents basic checklists which can be used to verify that safety has been properly taken into account in the planning and design of existing or proposed road infrastructure. It is intended to reduce the chances of unsafe road networks being constructed.

PART V: (Appendices A to C)

This section comprises the Appendices. These include a list of main references and guidance on where to get them, information on other useful background documents and brief details about the TRL microcomputer-based accident data system for developing countries.

(f) Sources of further in formation

The key publications listed in Appendix A are those which the authors consider to be most relevant to readers' likely needs and which provide additional information about many of the topics included here. Many of these publications may not be readily accessible to overseas readers so a list of the organisations producing them is given in Appendix A. Some of the publications are free but others require payment. Documents can be ordered by mail through reputable technical bookshops or from the addresses listed. The listing of useful UK documents provides an additional list of potentially relevant documents which may be of interest to individual readers seeking specific areas of knowledge or information. These are the main road safety related advice notes and guidelines issued to British road engineers by central government in the UK.
(g) Guidance on Use of Document

The document has been written as a number of free-standing sections which have been internally cross-referenced. It also has a comprehensive index. Those interested in a particular topic, e.g. road hierarchy, can refer to that particular section and can find all the key elements and internal and external references which need to be considered when examining that particular issue (internal references direct the reader to other relevant sections within this document and external references direct the reader to documents listed in Appendix A). Those interested in topics which do not merit a whole free-standing section can use the index to locate relevant sections of text. In this way the reader can readily find specific guidance/information on the areas of direct interest to him without necessarily reading through the whole document to get relevant information. It is, however, recommended that the document is read through cover to cover at least once so that the reader becomes familiar with the contents and their location. Thereafter the document can be used largely as a reference book for specific advice/information as required.

Chapters comprise a short introductory overview, followed by a series of 2-page sections describing key elements of planning, design or operation. Wherever possible, a standard format of presentation has been adopted for such sections. This is shown diagrammatically below.

As a consequence of the desire to have self-standing sections for easy access by the reader, a certain amount of repetition/duplication becomes unavoidable on topics which are closely related. The benefits from the format adopted are, however, considered to outweigh this minor disbenefit.

Road safety checklists have been provided as a free-standing chapter. These are to be used to check that proposed infrastructure schemes do not inadvertently include dangerous features which could be avoided through better planning or design. If the answer to any of the questions in the checklist is no, the reader is referred to the relevant sections for further information on how road safety deficiencies can be rectified or minimised.