

HIGHER TECHNICAL INSTITUTE

CIVIL ENGINEERING DEPARTMENT

Diploma Project

GEOMETRIC DESIGN OF HIGHWAYS

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Abstract

This report gives adequate information about Geometric Design with references to design speed, sight distance, horizontal and vertical alignment and analyze some recent geometric standards (UK, USA , Cyprus etc).

It is noted that traffic requirements, road safety and network considerations are different in developing countries and it is more convenient to define the objectives of road projects in terms of three levels of development of the road network. These are

Level 1: to provide access

Level 2: to provide additional capacity

Level 3: to increase operational efficiency

It is only when objectives of the road are at level 3 that standards such as those in Australia, Britain and USA are relevant and the principal assumptions in these standards are reviewed to assist in their adaptation to roads in developing countries.

Summary

The object of geometric design is to provide a basic level of safety and comfort for the road user and to ensure that design is both economic and uniform. Also it gives guidance on geometric design and the setting of geometric design standards for single carriageway rural (inter-urban) roads in developing countries.

It has been recognized that the behaviour and needs of road users in developing countries are often very different and as a result different standards may be appropriate. There is a need for developing countries to study the idea of the standards used in industrialized countries with a view to carrying out research under their own conditions in order to develop their own standards.

Introduction

Geometric design is the process whereby the layout of the road in the terrain is designed to meet the needs of the road user.

The principal geometric features are the horizontal alignment, vertical alignment and cross-section. The use of geometric design standards fulfills three objectives. Firstly, the standards ensure minimum levels of safety and comfort for drivers by the provision of adequate sight distances, coefficients of friction and road space for vehicle manoeuvres; secondly, they ensure that the road is designed economically and thirdly they ensure uniformity of the alignment. The design standards adopted must take into account the environmental conditions of the road, traffic characteristics and driver behaviour.

The selection of design standards is related to road function, volume of traffic and terrain, with additional procedures for the recognition and appropriate treatment of potential hazards. Opportunities for the relaxation of standards have also been identified. A basic assumption in the approach to design is that drivers receive clues about the standard of the road from local surrounding features such as terrain, levels and types of flows, as well as geometric elements. Additional design consideration or special signing will only be necessary where the information available to the driver may lead to incorrect interpretation and consequent danger.

A study to develop appropriate geometric design standards for use in developing countries is being undertaken by the Overseas Unit of TRRL (Transport and Road Research Laboratory).