

# Preface

This is my second book on the subject of road lighting. The first, also titled “Road Lighting”, appeared in 1980 in the series “Philips Technical Library” published by Kluwer, with co-author Prof. J.B. de Boer. Since that time, the technology of road lighting has progressed to keep up with the changes in lamp and lighting technology, in traffic and automobile technology, and especially in the thinking about energy and the environment. The introduction of solid-state light sources (LEDs) has provided the possibility to design innovative, truly-sustainable lighting installations that are adaptable to changing circumstances such as traffic density and weather conditions. To avoid pitfalls when designing such installations, a detailed knowledge of the typical characteristics of the many different light sources, and especially also of all the aspects determining the final quality of road lighting, is essential. Completely-new fundamental research on vision and new application research on visual performance and comfort, conducted at many different research institutions at many different places all over the world, is now available as a basis for the specification and the design of effective, energy-friendly and sustainable road-lighting installations.

The purpose of this present book, which represents a completely-fresh approach to the subject, is to outline the underlying principles on which modern road lighting is based and to leave the reader with an understanding of the background to the subject and a knowledge of how these principles should be applied in practice.

The book is divided into three parts. Part One discusses the lighting of open roads for motorised traffic as well as for cyclists, pedestrians and residents. The first chapters deal with the purpose of road lighting, visual performance, including the effects of mesopic vision and of the aging eye, and visual comfort. Traffic safety, personal security and pleasantness are the main issues here. Following chapters describe the relevant lighting criteria for good and efficient road lighting and show and discuss the international, European and North American standards and recommendations for road lighting. Next, lamps and luminaires are reviewed in terms of their practical properties and features, the intention being to facilitate a proper selection of this equipment for the various application fields. The road surface, as a means to reflect light towards the road user, must in fact be seen as part of the equipment of a road-lighting installation. Road-surface reflection properties are therefore dealt with in one of the “Equipment” chapters. The chapter “Design Aspects” provides the

link between theory and practice and supplies the reader with the knowledge needed for effective lighting design. The sustainability aspects of road lighting that have to be taken into consideration by the lighting manufacturer as well as by the lighting designer are also discussed in this chapter. The last chapter of part one deals with road-lighting calculations and measurements.

Part Two of the book is devoted entirely to the subject of light pollution. Lighting that lights not only the area intended but that spreads out uncontrolled into the surrounding areas and into the sky is an annoyance to society. The disturbing effects to residents, to motorised and slow-moving traffic, to astronomers and to wildlife and natural vegetation are described. The zoning and curfewing tactics that are employed to restrict light pollution are explained, and lighting criteria that can be used by the lighting specifier and the lighting designer to guarantee that installations will stay within acceptable light pollution limits are defined. International, European and North American standards and recommendations on the restriction of light pollution are listed and discussed. The last Chapter of this Part 2 deals with that lighting equipment that is specifically suitable to limit light pollution. It also provides practical design guidelines on controlling light pollution.

The subject of the third and final part of the book is tunnel and underpass lighting. The structure of this part is largely the same as that of part One. It has chapters discussing the purpose, the visual-performance fundamentals, the lighting criteria and the standards and recommendations for tunnel lighting. The concluding chapter deals with tunnel-lighting equipment and tunnel-lighting design aspects.

This book is not aimed solely at the road-lighting designer and road-lighting engineer in municipalities and local governments or the student of lighting design and engineering; there is much of interest here too for the town planner, town traffic engineer and environmental specialist, as well as for the lamp and luminaire developers and manufacturers.

I am much indebted to Derek Parker who did a great job editing this book, just as he did for the previous Road Lighting book, back in 1980.

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