THE MODELING OF FOREST ROAD STANDARDS FOR KHAO YAI NATIONAL PARK, THAILAND

INTRODUCTION

The tourist industry of Thailand is growing at a rapid rate, and has become the main source of national income. The new Thai government policy is aimed at supporting the tourist industry as well. Millions of both International and Thai tourists are flowing to national parks area every year. Many park roads are now congested, particularly around points of interest; others have a predictably brief grace time. Therefore, the National Park, Wildlife and Plant Conservation Department is urgently constructing many park roads and improving existing roads to serve tourism purpose. A thousand kilometers of park road are built every year in the national parks of Thailand. New-built park roads are rarely based on sound road standards. The carriageway and surfacing width vary from road to road. The maximum gradient often exceeds allowable safety standards. Excessive clearing, grubbing and tree felling has resulted in a large area of forest land being exposed which then damages national resources. Heavy cuts and fills of road construction may cause negative impacts. A lack of soil protection structures, such as retaining walls, slope protection or improperly drainage structures may result in high soil erosion effects. Furthermore, there is a low traveling safety for tourists and may frequently cause many road accidents. These newly built park roads have very high maintenance costs and a short performance life. Thus, park roads are multipurpose permanent investments. Besides providing many positive kinds of economic, social and environmental effects, they may cause negative impacts as well. For instance, erosion may be caused by new park roads and their construction if these activities are not properly managed. The resulting effects on park values about wildlife habitat and mobility, drainage, stream flow, and the climatic effect should be minimal. Moreover, preserving the integrity of the landscape, respecting ecological processes, insuring a fully rewarding visitor experience is the main purpose of park roads. Therefore, a multi-objective criterion for park road planning and design in National Parks of Thailand is needed.

PURPOSES OF STUDY

The lay-out and other geometric characteristics of a road have a direct influence on its final cost and, therefore, on the overall cost of transports. It was the purpose of this study to set down the basic standards for the satisfactory design of roads in the national parks of Thailand. The specific objectives of the study are as follows:

1. To study the park road planning and design, road construction, road performance, and park road density in National Park.
2. To study the geometric design of park roads in the national park area.
3. To develop the multi-objective mathematical programming models as decision support tools for park roads management.

Scope of Study

The study aimed at studying existing park road data in Khao Yai National Park, Nakhon Ratchasima, Nakhon Nayok, Prachin Buri, and Saraburi Provinces to derive the relationships of park road designing and cost data. These relationships can be used to formulate multi-objective mathematical programming models to obtain optimal values for park road design in national parks. Thus, this study intends to develop mathematical models for park roads in national park of Thailand for controlling park road design and construction in national parks.