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Candidate	Mr. Witoon Lertritsittiporn
Supervisor	Dr. Tawatchai Loasirihongthong
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Abstract

The purpose of this study is to develop a guideline for traffic circulation design of parking lots in Thailand. The study consists of three main parts related to the design of parking lots, namely, design standards, design process, and method for evaluation of parking circulation design. In this study, we first reviewed relevant documents and interviewed some designers of parking lots to understand the current practice in the above issues. We, then, developed the guideline and tested it with a case study to ensure that such guideline is appropriate.

After reviewing documents from Thailand, Japan, America, England, and Australia, we found that there are five categories of standards related to traffic circulation design of parking lot. The five categories are design car, parking bay, aisle, ramp and traffic control in parking lots. We also found that there are only two related design standards in Thailand, namely parking bay and ramp which prescribed in the Building Law, B.E. 2538. In Japan, there is a standard of design car while in America, England, and Australia have all categories of design standards in design manuals except the standard related to traffic control in parking lots. It should be noted that the standards used in the five countries above are similar in the aspect of elements of the standards but quite different in their details. The researcher, therefore, has proposed the design standards for use in Thailand as follows: (1) use the standards of Australia for design car, parking bay, aisle and ramp, and (2) use the standards of Bangkok Metropolitan Authority (BMA) for traffic control in parking lot.

As for the designing process, the researcher has proposed that the process should consist of three main parts, namely, parking demand study, parking service (supply) study, and evaluation of traffic circulation design of parking lot. The researcher has also proposed that one should evaluate traffic circulation design of parking lot in three main issues, namely, spending of time in the parking lot, safety of using the parking lot, and capacity of the parking lot. These three issues should be evaluated by using 11 measures of effectiveness (MOEs), namely, average travel time, average parking time, average unparking time, average pedestrian walk time, total average travel time, total intersection conflicts, total parking conflicts, total unparking conflicts, total rear end conflicts, probability of finding space, and occupation ratio of parking lot. The researcher also suggests the use of a computer program called PARKSIM to estimate the values of all 11 MOEs mentioned above.

The proposed designing process and the evaluation method were tested with a case study of the parking lot of the Queen Sirikit Convention Center. It is found that the process and the evaluation method can be properly used to identify the advantages and disadvantages of the different circulation designs of the parking lot. It is also found that sizes and angles of the parking bays in the case study are corresponding with Thai standards and traffic control devices are corresponding with the standards of BMA.

Keywords : Design / Parking / Circulation / Guidelines / Standard