

Juthathip Vittawasakul 2012: Planning of Work Schedules for Toll Booth Collectors.
Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering,
Department of Industrial Engineering. Thesis Advisor: Assistant Professor
Juta Pichitlamken, Ph.D. 101 pages.

We consider the workforce scheduling problem of toll booth collectors. The Expressway Authority of Thailand (EXAT) has more than three thousands of employees and takes care of 7 expressways. In this paper, integer programming (IP) models are developed for designing work schedules for toll booth collectors. We consider only the largest toll station at Dindang with the data traffic from August to November 2010. We assume that employees are identical; payment time does not depend on types of car; and every toll booths are alike. The IP models determine the number of toll booths required to satisfy the traffic and staff requirements. The proposed schedule decreases the number of shifts and reduces the work hours of and substitutes by 71.2 hours (or -6.32%) and 24 hours (-13.04%), respectively. However, this new schedule will increase the work hours of stand-bys by 55.6 hours (+19.75%). Nevertheless, the total working hours of the new schedule is 1,555.1 hours which is less than that of the current schedule by 40 hours (-2.51%). Although the reduction is small, the IP models help reduce the planning time and thus it can be done more frequently and less subjectively. With this in mind, we develop a planning tool using Visual Basic for Application on Microsoft Excel to help the workforce scheduling planner.

Student's signature

Thesis Advisor's signature