Application of production scheduling techniques for dispatching ready-mixed concrete

Kittipong Thawongklang, author

Abstrak

Nowadays, the ready-mixed concrete (RMC) industry plays an important role in construction projects, since it has become one of the mechanisms in construction works and it has become more widely used than in the past. Increasing efficiency is focused on in order to be competitive in business. Therefore, this study aims to increase efficiency of the delivery management system by using the modeling of production planning and management of daily scheduling and dispatching of ready-mixed concrete trucks in order to solve the bottleneck problems of production, which are consequently affecting the RMC delivery process .In fact, the capacity of ready-mixed concrete machines seems to be a limitation, since concrete can only be mixed and then delivered in batches, one vehicle at a time. Earliest Due Date (EDD) and First-Come, First-Served (FCFS) are two techniques of priority rules used for RMC scheduling in providing more precision and accuracy of related inputs which can be used in order improve efficiency of the entire RMC process. In the model, factors affecting the RMC delivery process, such as distances, travel speed and travel times are determined by using GIS–Geographic Information Systems software (ArcGIS). The mapping data is also input into the construction site data, which then builds a model based on priority rules to determine the production and dispatching schedule. Preliminary results from the model indicated that delivery delays can be reduced, in addition to improving daily scheduling and reducing planning time. Moreover, the Single Machine-Multiple Sites model was applied to a concrete truck freight management company that had only one manufacturing machine and it had to deliver to several construction sites in various urban areas. By improving efficiency, by optimizing delivery times and by reducing the cost of waiting time at various sites, this PDRMC model could cut operating costs and increase the company’s revenue because there will be time for more orders.