Optimization of the drayage problem using exact methods

Major liner shipping companies offer pre- and end-haulage as part of a door-to-door service, but unfortunately pre- and end-haulage is frequently one of the major bottlenecks in efficient liner shipping due to the lack of coordination between customers. In this paper, we apply techniques from vehicle routing problems to schedule pre- and end-haulage of containers, and perform tests on data from a major liner shipping company. The paper considers several versions of the scheduling problem such as having multiple empty container depots, and having to balance the empty container depot levels. The influence of the side constraints on the overall cost is analysed. By exploring the fact that the number of possible routes in the considered case is quite limited, we show that the model can be solved within a minute by use of column enumeration. Alternative constraints and problem formulations, such as balancing empty container storage level at depots, are considered. Computational results are reported on real-life data from a major liner shipping company.

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