Dynamic multi-depot multi-compartment refrigerated vehicle routing problem with multi-path based on real-time traffic information

College of Transportation Engineering, Dalian Maritime University, Dalian 116026, China

Abstract. Aiming at the dynamic multi-depot multi-compartment refrigerated vehicle routing problem with multi-path based on real-time traffic information, based on the idea of pre-optimization followed by real-time adjustment, a two stages optimization model with the goal of minimizing total cost is established. To solve this problem, this paper designed a hybrid chaotic genetic algorithm with variable neighborhood search (HCGAVNS) to generate the initial routes. In the real-time adjustment phase, this paper proposed a path selection strategy to update the selected paths. Multiple experiments are constructed to verify the validity of the model and the algorithm. This research has important theoretical and practical significance.

Conclusions. The conclusions of this paper are as follows：

(1) The real-time traffic information reflected by big data platform and the characteristics of complex and diverse road network environment in real life are used to plan distribution routes, which is conducive to improving distribution efficiency.

(2) The established model considers the impact of vehicle route planning on the damage degree of fresh goods and the impact of refrigeration cost, vehicle dispatch cost and time window penalty cost on the total cost, which can be more in line with the actual distribution

(3) The HCGAVNS ensures the diversity of initial solutions by using chaos phenomenon and adopts the strategy of elite reservation and roulette to ensure the effective convergence of the algorithm.

Fig. 1 schematic diagram of multi-path

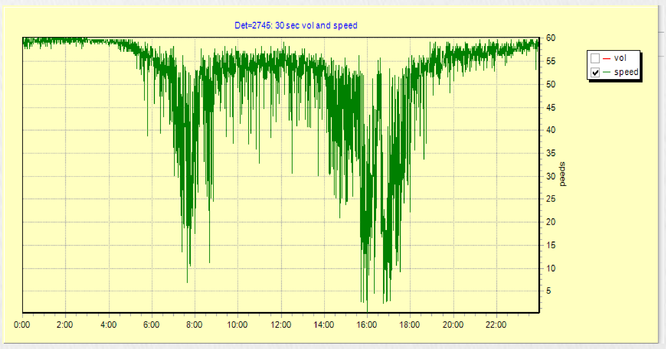

Fig. 2 The trend of vehicle speed

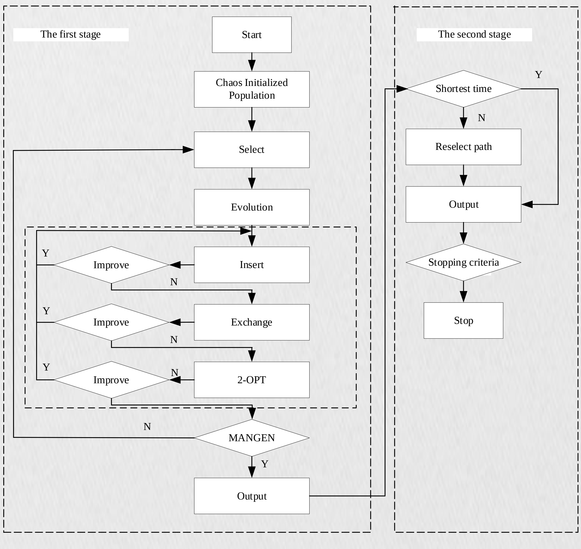

Fig. 3 schematic diagram of algorithm flow