SYSTEMS AND METHODS FOR SCALABLE, DECENTRALIZED AND COORDINATED LOGISTICS SCHEDULE PLANNING

ABSTRACT

Resource constraints at locations where multiple logistics service providers (LSPs) frequently visit can cause congestion, leading to the need for coordinated planning. Although able to improve efficiency, collaborative planning approaches deviate from the reality that LSPs are independent and may not share certain information with one another. The present invention proposes two-level optimizing systems and methods which are a scalable, decentralized, coordinated schedule planning approach which can be categorized as a Vehicle Routing Problem with Pickup and Delivery, Time Windows and Location Congestion with multiple LSPs. The two-level optimizing systems and methods improve the efficiency of the whole process of schedule planning, protect the privacy of each user, improve the schedule optimality for each user and at the same time improve the system optimality, which is more scalable and able to achieve on average 10% more gain within an operationally realistic time limit than a centralized planning approach.

Figure 1