**Proposal**

* **Article**

An Integrated Load-Planning Algorithm for Outbound Logistics at Webb Wheel

* **Group members**

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* **Summary**

Webb Wheel (WW) is a vehicle manufacturer of brake drums, rotors, hubs, spoke wheels etc. with two manufacturing plants located in Cullman and Siloam Springs. The research team designed an integrated model to simultaneously optimize the loading and routing decisions. The main challenge is dynamically changing and incomplete demand information. The model is divided into assignment and routing sub-problems. The assignment sub-problem resolves the mode of transport and the choice of carrier while minimizing the total setup and connection costs. Based on the results of the assignment sub-problem, the routing sub-problem is to find the drop sequence and minimize the shipment cost using a modified TSP (Travelling Salesman Problem). Through the testing of the data, the effectiveness of the model on load-planning process has been proven, and the company has saved 4.4% costs.

* **Outline**

1. Generate data, including Customer location, Seed location, Inventory, Actual routes, order number .etc. The location will based on latitude and longitude within Edinburgh area and we assume the route and distance between different locations is straight line.

2. Solve by 2 steps: First, build the assignment problem model which is used to decide transporting product p to seed location s. Second, solve the Routing Problem by using N-MTSP model based on the results in first step (best route from seed location s to customer place j).

3. Discuss the impact of different value of Weight-Based Truck Utilization (TU), Route-Based Utilization (RU) and Penalty-Based Policy (PP) to this model.

4. We will change the customer location distribution and seed location distribution and compare the impact of different distribution to this model.

Challenge: It is hard to get the amount of saving money