**Proposal**

**Article:** [An Integrated Load-Planning Algorithm for Outbound Logistics at Webb Wheel](https://www.jstor.org/stable/43700601?Search=yes&resultItemClick=true&searchText=An&searchText=Integrated&searchText=Load-Planning&searchText=Algorithm&searchText=for&searchText=Outbound&searchText=Logistics&searchText=at&searchText=Webb&searchText=Wheel&searchUri=%2Faction%2FdoBasicSearch%3FQuery%3DAn%2BIntegrated%2BLoad-Planning%2BAlgorithm%2Bfor%2BOutbound%2BLogistics%2Bat%2BWebb%2BWheel%26amp%3Bacc%3Don%26amp%3Bwc%3Don%26amp%3Bfc%3Doff%26amp%3Bgroup%3Dnone&ab_segments=0%2Fbasic_SYC-4946%2Fcontrol&refreqid=search%3A853d99a3e12e44498aa82ed0a42a845d&seq=1#metadata_info_tab_contents)

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**Summary**

Webb Wheel (WW) is an auto parts manufacturer. The research team has 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**

***Week 4 – 5***: Build the assignment sub-problem model which is used to decide transporting product *p* to seed location *s*. Generate sample data, including customer location, seed location, inventory, actual routes, and order number etc. The location is based on latitude and longitude within Edinburgh area and we assume the route and distance between different locations is a straight line. Then test the model and discuss the strengths and limitations of the model.

***Week 6***: Conclude the achievements and finish the interim project.

***Week 7 - 8***: Build the routing sub-problem by using N-MTSP model based on the results of the assignment sub-problem (best route from seed location *s* to customer place *j*). Then generate data, test the model and discuss the strengths and limitations of the model.

***Week 9 - 10***: Discuss the impact of different value of Weight-Based Truck Utilization (TU), Route-Based Utilization (RU) and Penalty-Based Policy (PP) to this model. Change the customer location distribution and seed location distribution and compare the impact of different distribution to this model. Also discuss the implementation of the solution and finish the final report.

***Week 11***: Revise the final report and prepare for the presentation.