

## Optimisation of Intermodal Transport Chain of Supermarkets on Isle of Wight, UK

**Authors :** Jingya Liu, Yue Wu, Jiabin Luo

**Abstract :** This work investigates an intermodal transportation system for delivering goods from a Regional Distribution Centre to supermarkets on the Isle of Wight (IOW) via the port of Southampton or Portsmouth in the UK. We consider this integrated logistics chain as a 3-echelon transportation system. In such a system, there are two types of transport methods used to deliver goods across the Solent Channel: one is accompanied transport, which is used by most supermarkets on the IOW, such as Spar, Lidl and Co-operative food; the other is unaccompanied transport, which is used by Aldi. Five transport scenarios are studied based on different transport modes and ferry routes. The aim is to determine an optimal delivery plan for supermarkets of different business scales on IOW, in order to minimise the total running cost, fuel consumptions and carbon emissions. The problem is modelled as a vehicle routing problem with time windows and solved by genetic algorithm. The computing results suggested that accompanied transport is more cost efficient for small and medium business-scale supermarket chains on IOW, while unaccompanied transport has the potential to improve the efficiency and effectiveness of large business scale supermarket chains.

**Keywords :** genetic algorithm, intermodal transport system, Isle of Wight, optimization, supermarket

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