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Carbon emissions comparison of last mile delivery versus customer pickup

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Abstract

The last mile problem comprises one of the most costly and highest polluting segments of the supply chain in which companies deliver goods to end customers. The recent trend towards green supply chains and social and environmental responsibility has led to many new green initiatives. One business strategy gaining popularity involves retailers offering home delivery. This paper performs a comprehensive comparison of carbon emissions resulting from conventional shopping involving customer pickup with trip chaining versus e-commerce-based online retailing involving last mile delivery to customers' homes. The break-even number of customers for carbon emissions equivalence is determined and analysed for the feasibility of last mile delivery at a desired service level based on the radius of the demand region and the delivery time available. A methodology for calculating the difference in expected carbon emissions is

formulated and demonstrated to quantify which method has the least harmful impact on the environment.

Keywords:

supply chain management | last mile problem | carbon emissions | sustainable logistics

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