



An Integrated Routing Model to Estimate Carbon Dioxide Emissions from Freight Vehicles

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Abstract: The issues of global warming and climate change are a worldwide concern and the UK government has committed itself to major reductions in CO₂ emissions. Road transport currently accounts for about 22% of total UK emissions of CO₂, and has been steadily rising. Therefore, initiatives are required to try and reduce the gas emissions in this sector. An enhanced computer based vehicle routing model has been developed to assess CO₂ emissions from freight vehicles. The approach used in this research brings together elements from transportation planning and environmental modelling, combined with logistics based vehicle routing techniques. It has not been the intention to identify new algorithms for vehicle routing. An existing vehicle routing model has been used and a technique developed which involves modifications to the method of representing road speeds used within the model, to allow for the calculation and minimisation of CO₂ emissions. The results have shown that the model produces routes which are cost effective and cleaner, in terms of CO₂ emissions.

Bio: Andrew Palmer has 30 years experience working as a consultant in the logistics sector. He is the original author of the CAST supply chain network planning model which is used by hundreds of major companies throughout the world. Andrew has just completed a part time PhD at Cranfield University researching methods of evaluating carbon dioxide emissions using vehicle routing techniques. He has been involved in a number of research projects for the Department for Transport with Cranfield University such as the development of a computer model to assess the cost and emission implications of global product sourcing, and an emissions model for reverse logistics, and with Heriot Watt examining the cost and environmental implications of using a longer, heavier



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vehicle on British roads. He has also undertaken various other projects for the DfT, DEFRA, DTI, GLA and Transport for London, as well as projects for a large number of commercial organisations.

Andrew has published many articles, and has also spoken at numerous conferences, about the principles of strategic logistics planning. He was recently interviewed for a consumer television programme on BBC1 about home delivery problems, and how they can be resolved. He has accredited teacher status and is a regular visiting lecturer on graduate and undergraduate courses at a number of universities including the University of Westminster, Heriot-Watt, Universidad de Deusto (Bilbao) and is a visiting fellow at Cranfield University. His subjects include strategic logistics network design and related quantitative techniques such as logistics modeling.