

Essays on operational freight transport efficiency and sustainability

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- 2: Arvidsson, N. and Browne, M. (2013) A review of the success and failure of tram systems to carry urban freight: the implications for a low emission intermodal solution using electric vehicles on trams, *European Transport \ Trasporti Europei*, Issue 54, Paper n° 5, ISSN 1825-3997
- 3: Santén, V. and Arvidsson, N. (2011) Road freight transport efficiency and less environmental impact – the perspectives of transport buyers and operators, Published in the proceedings and presented at Nofoma, Harstad, Norway, June 9-10, 2011.
- 4: Arvidsson, N. (2013) The milk run revisited: A load factor paradox with economic and environmental implications for urban freight transport, *Transportation Research Part A*, 51, 56–62
- 5: Liimatainen, H., Arvidsson, N., Beate Hovi, I., Christian Jensen, T., Nykänen, L., Kallionpää, E., (2013) Road freight energy efficiency and CO2 emissions in the Nordic countries, accepted for presentation at WCTR, 2013, July 15-18



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Freight transport efficiency, as one proposed abatement strategy for transport related emissions, is a concept that has received much research attention during the last decade, often from the transport buyers' perspective. In contrast, the aim of this thesis is to explore the subset concept of operational freight transport efficiency and how it affects transport related emissions from the perspective of the transport operator. The focus is on the transport operators and their interfaces with other actors such as transport providers/forwarders, transport buyers, and the society. I open with a dissection of the term "operational freight transport efficiency." I make these primarily semantic efforts to open up and introduce a few aspects that are commonly overlooked. The concept is argued to be "fuzzy", in the sense that it means different things depending on who you ask, and a "wicked problem", in the sense that the problem has no clear solutions with significant and present trade-offs. The methodology, or vessel, used in this thesis to launch a "critical spirit" is "phronetic social science". After phronetically testing the efficiency measures, some recommendations are presented. A suggestion on operational decarbonisation is provided and the attitudes and trade-offs among the actors are explored. The thesis identifies a gap with respect to the absence of a common semantic definition of the concept of operational freight transport efficiency measures. The thesis proposes that the gap be filled with the following derived definition of operational freight transport efficiency: "A set of utilisation measures of time, space, vehicle, fuel and driver in the movement of goods". From the operators point of view, as well as from an aggregated level, also missing are the trade-offs between environmental and economic considerations. Most operational freight transport efficiency improvement measures are likely to reduce emissions, however; it is probable that mere cost-reduction measures will not lead to reduced emissions in the long term. The traverse across these topics represented by the present thesis is offered as a theoretical contribution to the discussion about defining what is meant by sustainable logistics. In other words, what the word sustainable means in a logistics context.

Key words: operational freight transport efficiency, operator, sustainability, logistics, phronetic

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