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Urban logistics—how can it meet policy makers' sustainability objectives?

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Abstract

This paper discusses how urban freight activity can function such that it meets the urban sustainability objectives policy makers are now beginning to implement. It considers: the importance of urban freight transport in maintaining the economic vitality of the city; the negative impacts that it imposes; the concept of urban sustainability and the development of sustainability strategies; and the means and measures by which freight transport could be made more sustainable. It presents results from a project that investigated the current freight transport operations of seven different companies in three urban areas in the UK. The potential operational, financial and environmental effects of four policy measures on these operations are considered.

Keywords: Urban; Freight transport; Logistics; Sustainability; Policy measures; Research approach

1. Introduction

The overall aim of this paper is to consider how urban freight activity can function in a manner such that it meets the urban sustainability objectives policy makers are now beginning to implement. It opens by considering the importance of urban freight transport in maintaining the economic vitality of the city, and the negative impacts that it imposes. The concept of sustainability and the development of sustainability strategies are then discussed before it addresses the means and measures by which freight transport could be made more sustainable. The paper then continues by presenting a project that has investigated the current freight transport operations of seven different companies in three urban areas in the UK. The potential operational, financial and environmental effects of four policy measures on these operations were investigated by obtaining each company's expected response to these policy measures and applying these changes in their behaviour to their current operational vehicle data. The results suggest that the policy measures will vary in their operational and financial impact on the distribution companies and also in terms of the change in vehicle pollutant levels.

2. The importance of urban freight transport

Traffic levels and their impacts in British towns and cities have received growing attention in recent years, much of this has been directed at public transport and private car traffic while relatively little consideration has been paid to road freight transport.

However, urban freight transport is important for many reasons (Meyburg and Stopher, 1974; Hasell et al., 1978; Ogden, 1992). Among the most significant are:

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- It is fundamental to sustaining our existing life style.
- The role it plays in servicing and retaining industrial and trading activities which are essential major wealth generating activities.
- The contribution that an efficient freight sector makes to the competitiveness of industry in the region concerned.
- The effect of freight transport and logistics costs on the cost of commodities consumed in that region.
- The total cost of freight transport and logistics is significant and has a direct bearing on the efficiency of the economy.
- The environmental effect of urban freight movements (in terms of energy use and environmental impacts such as pollution, noise, visual intrusion etc.).

2.1. Impacts of urban freight transport

Road freight vehicles operating in an urban environment generally emit a greater proportion of certain pollutants per kilometre travelled than other motor vehicles such as cars and motorcycles. This is due to their higher fuel consumption per unit of distance travelled and the fact that many of them use diesel as a fuel.

Existing freight and passenger transport systems in urban areas create a variety of economic, environmental and social impacts. These include (UK Round Table on Sustainable Development, 1996):

Economic impacts: (i) congestion, (ii) inefficiency and (iii) resource waste.

Environmental impacts: (i) pollutant emissions including the primary greenhouse gas carbon dioxide, (ii) the use of non-renewable fossil–fuel, land and aggregates, (iii) waste products such as tyres, oil and other materials and (iv) the loss of wildlife habitats and associated threat to wild species.

Social impacts: (i) the physical consequences of pollutant emissions on public health (death, illness, hazards, etc.), (ii) the injuries and death resulting from traffic accidents, (iii) noise, (iv) visual intrusion, (v) the difficulty of making essential journeys without a car or suitable public transport, and (vi) other quality of life issues (including the loss of greenfield sites and open spaces in urban areas as a result of transport infrastructure developments).

However, as Plowden and Buchan (1995) note "Freight transport is essential to the modern economy. An efficient system must provide the customer with a good service at a reasonable cost." However, increasing congestion in urban areas has called into question our ability to achieve high levels of efficiency and as the Freight Transport Association have observed: "While industry has achieved significant success in improving vehicle productivity and utilisation, urban congestion imposes major constraints on further improvements" (Freight Transport Association, 1996).

3. Developing a sustainability strategy

The concept of "sustainability" and "sustainable development" has become increasingly influential in policy considerations in recent years. The most widely accepted definition of sustainable development is "development that meets the needs of the present without compromising the needs of future generations to meet their own needs" (World Commission on Environment and Development, 1987). This was the definition used by the World Commission and then endorsed by the United Nations at the Earth Summit in Rio in 1992. This conference led to a focus on the policy action required to bring about sustainability, known as Agenda 21, which, whilst having no force in international law, has been adopted by many national governments (Mazza and Rydin, 1997). In the UK, as a result, many local authorities have been preparing environmental strategies.

A key problem to implementing an achievable sustainable strategy is determining the parameters of measurement (e.g. geographical scale, environmental and social impacts, etc.), and not surprisingly it is extremely difficult to achieve a workable, acceptable set of targets, actions and measures which will result in more sustainable cities, and a more sustainable urban freight transport system within that city.

3.1. Sustainability strategies for urban freight transport

The aim of a sustainable transport strategy is "to answer, as far as possible, how society intends to provide the means of opportunity to meet economic, environmental and social needs efficiently and equitably, while minimising avoidable or unnecessary adverse impacts and their associated costs, over relevant space and time scales" (UK Round Table on Sustainable Development, 1996). Since freight transport is part of the transport system it follows that the issue of sustainability must be addressed with regard to freight transport.

Urban freight movement can be improved so as to make it more sustainable in various ways. It is important to distinguish between two different groups who are capable of changing the urban freight system and the rationale for their doing so:

- *Changes implemented by governing bodies*—i.e. the introduction of policies and measures that force companies to change their actions and thereby become more environmentally or socially efficient (e.g. changing the way in which they undertake certain activities) (Ogden, 1992).