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Implementation and impacts of low emission zones on freight activities in Europe: Local schemes versus national schemes

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Abstract

One of the ways in which air quality in urban areas can be improved is by introducing Low Emission Zones, which are areas to which access by the most polluting vehicles is restricted. The decision to implement such zones may be taken either locally or as part of a national scheme. The research presented in this paper aims to examine the differences of socio-economic impacts between the implementation of each type of scheme, in particular with regard to freight transport. We have taken as examples two cities with Low Emission Zones: London and Berlin.

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1. Introduction

Human health, as it is affected by the environment, is an important issue for different levels of government, from the European Union to local authorities. In 1993 and 2002 the European Union implemented the fifth and sixth Environmental Action Programmes (EEC, 1993; EU, 2002) which set out to achieve “a high level of protection of ... human health”, “contributing to a high level of quality of life and social well-being for citizens by providing an environment where the level of pollution does not give rise to harmful effects on human health and the environment”

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and setting out environment and sustainability goals to be achieved by 2020 and 2050. In addition, the most recent European Union transport White Paper, which was published in 2011 (EU, 2011), stresses the need to develop new transport systems which consume less energy and therefore produce less pollution. The goal of this White Paper is to achieve transport which is more sustainable, particularly in urban areas. The reason for this is that transport and environmental sustainability issues are more severe in urban areas, in view of the high concentrations of activities and people.

It was in this context that the introduction of Low Emission Zones (LEZ) in Europe was encouraged (EU, 2008). These are zones to which access by the most polluting vehicles is restricted, on the basis of the vehicle pollution criteria laid down in standards according to vehicle age and type. At the beginning of 2015, there are approximately 200 zones of this type in Europe. The implementation mechanisms vary, in some cases involving national plans (as in Germany and the Netherlands), and in others more local arrangements (London, Prague). This has prompted us to ask about the impacts and benefits of each of these scales of action, particularly with regard to freight activities which is the principal target for these policies.

The goal of the paper is to describe the impact of the governance of Low Emission Zones, on the basis of two main examples, London and Berlin. The vast majority of Low Emission Zones restrict freight vehicle access. Freight transport is an important issue in urban areas, but one that is frequently a minor consideration for public policy, in spite of its considerable economic and social importance. In order for the various stakeholders in the freight transport sector to be able to adapt, the public policies that are implemented at local and national level need to be coherent and joined-up, and carriers need to engage in a thorough examination of their business activity and how they can modify their fleet replacement plan.

This paper will examine the case of two major cities in order to compare the types of governance: London in the case of a local plan and Berlin in the case of a national plan. We have characterised London's plan for a Low Emission Zone as local because it was decided within Greater London. Berlin's Low Emission Zone (*Umweltzone*) implements the German Federal government's national plan with some local adaptations.

This paper is structured as follows: it begins with a description of the current state of knowledge and our methodology (section two). In section three, we shall describe the temporal aspects of the implementation of Low Emission Zones and how the two types of governance differ in this regard. In section 4, we shall detail the influence of the selection of one or other type of governance.

2. State of Art and Methodology

2.1. Pollution problems in cities: transport is a major contributor

The public authorities regularly blame road transport during periods of peak pollution, and indeed the sector is responsible for a considerable proportion of Greenhouse Gas Emissions – as much as 20% in the EU in 2010 (EEA, 2012). The amount of pollutant emissions produced by freight vehicles exceeds the proportion of such vehicles in the traffic. This is essentially due to the type of fuel they use: in Europe, with the exception of Austria and France, the majority of cars use petrol, while the majority of HGVs use diesel which generates a large amount of Particulate Matter (PM), which is recognised by the WHO (IARC, 2012) as carcinogenic.

Transport is also a major source of other pollutants such as Oxides of Nitrogen (NO_x), and the public authorities are therefore trying to reduce the sector's impact from this standpoint. A high proportion of the pollutant emissions in both our study areas are generated by road transport. For example, in Berlin, it is responsible for 36% of the PM and 47% of the NO_x (Senate of Berlin, 2005). According to a study published by *Transport for London* (2008), Heavy Goods Vehicles (HGV) traffic is responsible for 25% of the London's PM and 57 % of its NO_x.

There is a need for the public authorities to respond to the environmental issues evidenced by these figures. Low Emission Zones appear to be a possible way of reducing the negative externalities of road transport which is the main mode used to carry freight in urban areas.

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