Abstract

In light of new, stricter European limits coming into effect, for the safety of citizens and the environment from air pollution contamination, compliance with the limits in cities and regional conurbation constitutes a common problem.

The directives of the European Union require the generation of a clean air plan and action plan, if the limits are violated or rather are violated in foreseeable future. Limit violations are mostly registered in the area of congested roads. This is why different air pollution control measures are implemented in Germany, for example “green zones”. The choice of a suitable measure is difficult, because there is little hands-on experience of the effects of reduction measures and several points still require clarification.

The aim of this thesis is to determine the fundamental factors of influence on the potential effectiveness of air pollution control measures and to develop criteria to categorize these. These criteria are then applied to different hot spots, to test the suitability of the data.

Air pollution control measures are divided into four categories: traffic control, urban development, techniques & fuel and other measures. The focus of this thesis is on traffic control measures to reduce air pollution concentrations of particulate matter ($\text{PM}_{10}$) and nitrogen oxide ($\text{NO}_x$). Measures of traffic control are subclassified into seven target areas: financing and regulatory measures, collective information and collective control, individual information and control of motor vehicles, management of public transport, cargo and fleet management, organization of utilization of motor vehicles and road business management. This is followed by a more detailed description.

Based on extensive literature research, the factors that influence the potential effectiveness of traffic measures were described and divided into four categories: traffic, urban development, meteorology and structure. Not all of the identified factors have a proven or significant relevance on the effect of traffic measures. Therefore the most relevant factors were chosen and afterwards compiled for those criteria, which allow for the classification of the factors. A classification and the linked value of a criterion depend on the availability of the necessary data. This why the criteria were applied to hot spots of some major cities in Germany in the next step: Darmstadt, Frankfurt, Munich, Augsburg, Stuttgart, Erfurt, Aachen, Dortmund and Tübingen. It transpired that much of the relevant data for classification is already included in the clean air plan or are available in the communes internally. It turned out, that the expenditure of the capture for the local authorities is comparative low and that there are no complex measurements required. The communes can compare already established and approved measures in other cities and their effects.
This way costs due to the choice of less qualified measures, based on the existing boundary conditions, can be avoided or at least be reduced. The next step would be to create a database with already approved traffic measures, specifying the classified factors of influence and the reduction potential for each of these.

Susanne Gruber

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