

WIDENING SHOP OPENING HOURS AND THE EFFECTS ON POPULATION EXPOSURE TO NO₂

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Abstract

Decisions on low emission zones, congestion charging or building a school next to a busy road have obvious implications on population exposure to traffic-related pollutants like NO₂. On the other hand, certain policies that seem unrelated to either the transport or air quality domain may nevertheless have an unintended secondary impact on population exposure.

In this work we assessed the impact of widening shop opening hours in the Netherlands on population exposure to NO₂ by using the activity-based transportation model ALBATROSS. The modelling framework, including the AB-model, the emission model MIMOSA and the dispersion model AURORA, will be summarized in a nutshell and the emphasis will be on the results.

The scenario considered here involves a widening of shop opening hours for daily and non-daily shopping. In the scenario shops are open from 6 a.m. until 10 p.m., which allows shopping activities earlier in the morning as well as shopping later in the evening.

The scenario leads to a considerable increase of up to 6% in time spent on non-daily shopping activities. We can see an increase in transport time as well, although the effect is smaller. This augmentation is offset by less time spent on leisure and in-home activities. Another effect that propagated from our data is the shift of shopping activities towards the early and late hours of the day.

As a consequence of people performing different activities on different locations, concentrations and population exposure will change. Population exposure to NO₂ in the Netherlands will rise with 0,4% on an average weekday. In the evening hours and in certain neighborhoods a substantial increase of 0,5 µg/m³ can be observed.

This work presented the first analysis of a scenario generated with the activity-based model ALBATROSS and the effect on exposure. We demonstrated that by using this approach the effect of a policy measure on population exposure can be assessed.