

VITALISE: eValuating the Impact of urban mobility measures on air quality and public health

Description

Air pollution continues to be one of the main issues in urban areas. In the particular case of Barcelona (Spain), chronic NO₂ and PM_{2.5} exceedances are still recorded in urban traffic stations, highlighting the contribution of the road transport sector to population exposure to ambient concentrations. At the same time, several studies have shown that the urban plume of Barcelona very often also causes severe O₃ episodes in the northern plains and valleys.

Public administrations are currently testing several management strategies to reduce onroad traffic emissions. Due to the failed outcomes in reducing NO_x by the reduction of vehicle emissions (i.e. the diesel gate scandal), local authorities are focusing their attention on mobility policies, which try to reduce the number of circulating vehicles within the city and the total distance made by the commuters. In order to better assess and manage emission abatement measures, the application of numerical models in combination with monitoring data is highlighted in the 2008/50/EC EU Ambient Air Quality Directive as a fundamental tool. Nevertheless, the modelling chain used for assessing the impact of these measures has to be fit-for-purpose and properly checked and verified. Recent studies have shown that an integrated (i.e. coupling between transport demand and emission models) and multi-scale (coupling between mesoscale and microscale air quality models) approach is needed for the evaluation of traffic management strategies in order to: i) properly reflect the changes of traffic dynamics on the emissions, ii) account for the potential rebound and regional effects derived from the implemented measures and iii) investigate the local effect and changes in exposure at the street level.

The main objective of this proposal is to investigate what is the effect of several Barcelona's local traffic management strategies on urban and regional air quality levels as well as public health. To address this scientific question, a multidisciplinary approach is planned that combines expertise in emission and air quality modelling, field measurements of air quality, transport modelling and health impact assessment.

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