

AN INTEGRATED ASSESSMENT APPROACH TO EVALUATE THE IMPACT OF MOBILITY SCENARIO'S ON ROAD TRANSPORT EMISSIONS AND AIR QUALITY

C. Mensink, F. Lefebvre, A. Colles, L. Janssen, L. Int Panis, R. Torfs
Integrated Environmental Studies, VITO, Mol, Belgium

We discuss an integrated assessment approach which has been designed to evaluate the impact of various mobility scenario's on transport emissions and air quality on an urban and regional scale. The system consists of a set of original, well validated models that are connected in a modular and flexible way. The road transport emission model MIMOSA calculates hourly emissions per street segment for CO, NO_x, VOC, PM, SO₂, CO₂, N₂O, CH₄, NH₃ and heavy metals. Emission factors are derived from experimental data collected by Vito's VOEM system ('on-road' measurements) as well as from the Copert-III & MEET methodologies. The model also distinguishes between hot emissions, cold start emissions and emissions due to evaporation. The output of MIMOSA is used to evaluate the air quality on urban and regional scales using the AURORA model. It provides hourly concentrations with a resolution down to 1 km², using advanced nesting techniques. AURORA has been applied for the cities Antwerp (B), Ghent (B), Budapest (H) and for the Ruhr area (D) and is used in various EU 5th framework projects (BUGS, DECADE). Air quality in street canyons is assessed by using the street box model, where the concentration in the street is determined from a mass flux balance between a horizontal advective flux, a turbulent diffusive vertical flux and a continuous road transport emission source. The output of AURORA includes an assessment of human exposure and an evaluation of environmental damage costs using the ExternE methodology.