

**Master Thesis:**  
(optional in English or German)

## Impact of Roadside Vegetation Barriers on Air Quality

### Motivation and Goals:

Line-like vegetation structures consisting of hedges, shrubs, trees, or combinations thereof, next to roads affect the wind flow and dispersion of traffic-emitted pollutants. They are increasingly considered in the built environment as a measure to improve air quality by reducing leeward traffic pollutant concentrations. The aim of the study is to systematically investigate and quantify the effects of roadside vegetation barriers on the air quality in the near-field of roads.

### Approach:

Investigations of traffic pollutant dispersion at a reduced scale model will be carried out in an atmospheric boundary layer wind tunnel. Concentration fields of traffic emissions will be measured for various line-like vegetation barriers. Experiments shall be performed with vegetation barriers of different height, width, porosity (permeability) and distance to the road. In order to simulate the aerodynamic characteristics of vegetation barriers and their effects on air flow and pollutant dispersion, geometrically similar permeable bodies made of porous materials are employed, see [1].



**Begin:** immediately or on agreement  
**Requirements:** basic knowledge in Fluid Mechanics

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### **Literature**

[1] Gromke, C., Jamarkattel, N., Ruck, B. (2016) Influence of roadside hedgerows on air quality in urban street canyons. Atmospheric Environment, Vol. 139, pp. 75-86.