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**Master thesis**

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Name: Nguyen Van Thuong

Topic: **An Overall Evaluation of Health Impacts  
from Traffic at Signalized Intersections**

Supervisors: Prof. Dr.-Ing. Manfred Boltze  
M.Sc. Wei Jiang

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TECHNISCHE  
UNIVERSITÄT  
DARMSTADT



## Abstract

Traffic has many adverse effects on public health, including traffic accidents, physical disability caused by exposure to vehicle emissions (air pollution and noise emission) etc. In recent literature, health impacts from traffic has been covered extensively and several approaches have been used; however, few studies give a comprehensive understanding of estimating health impacts from traffic-related air pollution, noise emission and accidents. The aim of this study is to develop an overall methodology to estimate health impacts from traffic at signalized intersections, and focusing on identifying different methods used to estimate health impacts from traffic-related air pollution. In this study, a comprehensive review of existing methods to estimate (i) vehicle emission, (ii) pollutant concentration in ambient environment, (iii) exposure to pollutants for people present in the vicinity, and consequently, the (iv) health impacts from exposure is presented in a systematic way. The study identifies primary and secondary impacts from traffic, to estimate resultant impact on human health. The methodology used for impact assessment is based on reviewing existing literature to identify and adapt different methods used for estimation of impacts, including calculation methods (deterministic models) and simulation methods (dynamic models). For each type of model, input requirements, procedure(s), output(s) and overall considerations in calibration and validation processes is provided. The study determines the relationships between traffic signal control and its impact on vehicles, resulting impact on emission concentrations in the ambience, and the consequent exposure and health impacts. The study has its limitations, and suggestions for further research are included in the conclusion.

**Keywords:** signalized intersection, traffic model, pollution concentration, exposure, health impact