Using Traffic Models as a Tool When Creating Noise Maps

- Methods used in the EU project QCity

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Outline

- ✓ Short introduction to QCity
- ✓ The KTH part of the project
  - Scenarios
  - Method description
  - Method results
- ✓ Ongoing work

Background

- ✓ QCity – An EU founded project in the sixth framework, with 28 participants in 10 countries.
- ✓ QCity – A duration of 4 years, starting February 1th 2005.
- ✓ Supports the EU directive 2002/49/EC regarding noise mapping and action plans.

Aim

A toolbox with different noise mitigation measures

Work Package 2.3

Traffic Measures Impact on Noise Levels

- ✓ Traffic Control
- ✓ General measures to reduce car traffic
- ✓ Car ownership and car type choice
- ✓ Driver behaviour

Methods:

Traffic models and noise mapping software.

Study areas:

A suburb in Stockholm and a central part of Stockholm

Noise Mapping

Traffic data input:

- ✓ V - Volume [Vehicles/h]
- ✓ s - Speed [km/h]
- ✓ Share of heavy vehicles [%]

Periods: Day, Evening, Night → L_{DEN}, L_N

The IMAGINE project

"There is no superior type of traffic model"

Choice of model depends on:

- ✓ Study area (main roads/urban area)
- ✓ Model currently in use
- ✓ Availability of data
- ✓ Measures that have to be assessed

Macroscopic Simulation

SamPers

Demand model

Models the number of people who wants to travel from one place to another with a specific mode.

Network assignment model (Emme/2)

Equilibrium model decides which route a traveller uses and herewith the total traffic volumes.

Result Base Scenario

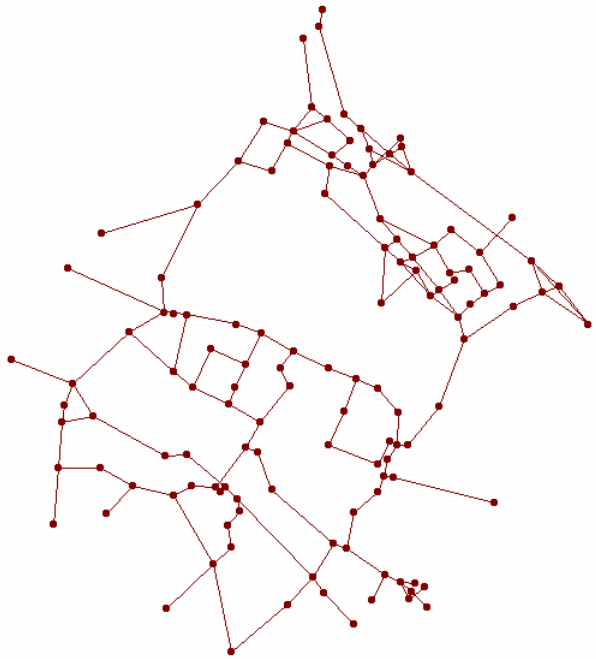
Peak hour traffic

Off-Peak hour traffic

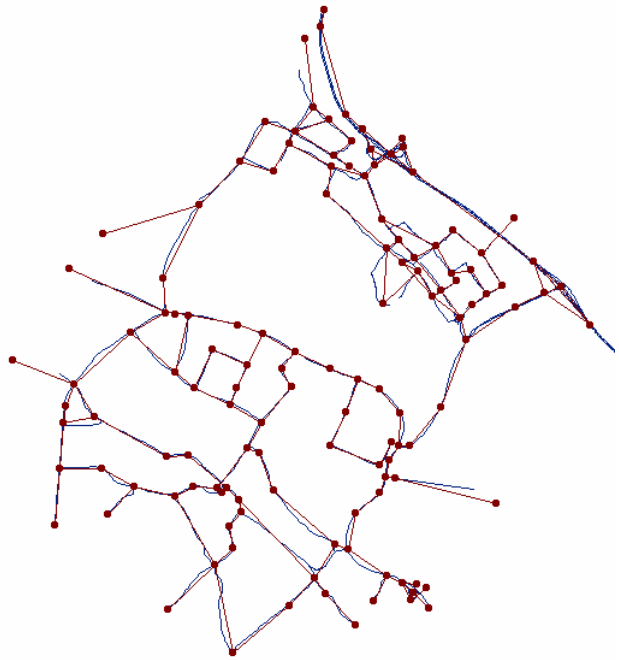
Interface Macro Simulation

Geographical correspondence

Road network



Model network



Matched road network

Interface Macro Simulation

Traffic data

Volume:

$$V = V_{AB} + V_{BA}$$

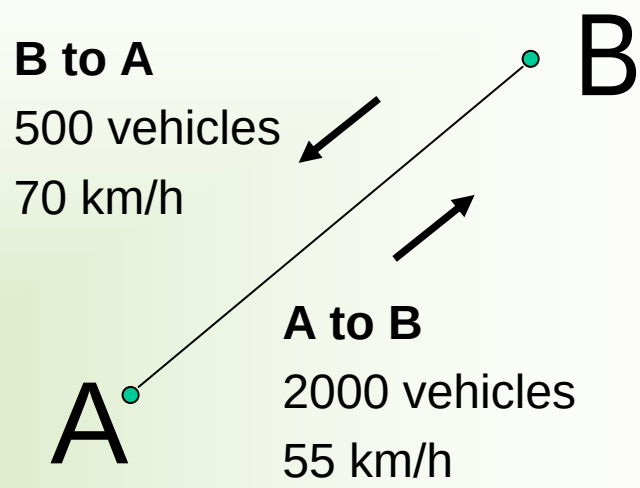
Speed:

$$s = \frac{s_{AB} \cdot V_{AB} + s_{BA} \cdot V_{BA}}{V_{AB} + V_{BA}}$$

Weighting:

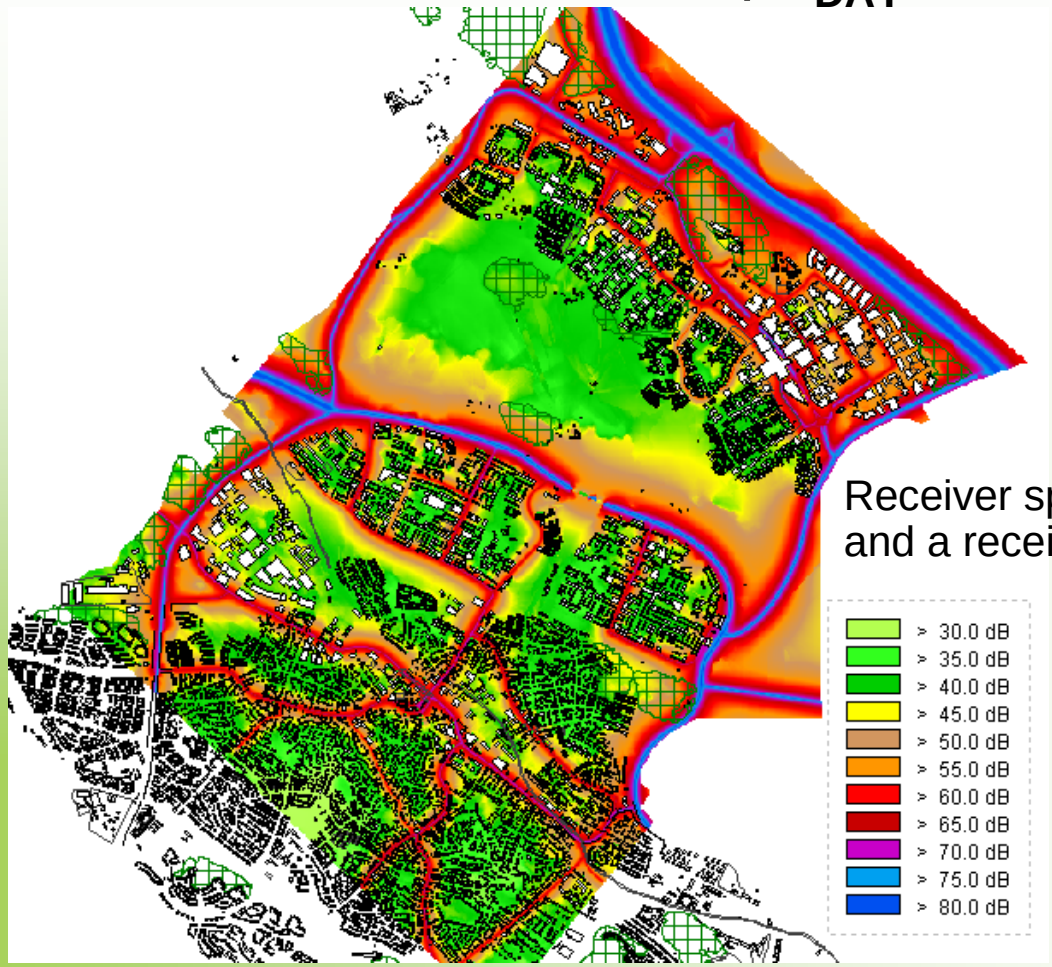
$$x_{Day} = \frac{4 \cdot x_{PH} + 8 \cdot x_{OPH}}{12}$$

Heavy vehicles: Trucks and buses



Noise Mapping

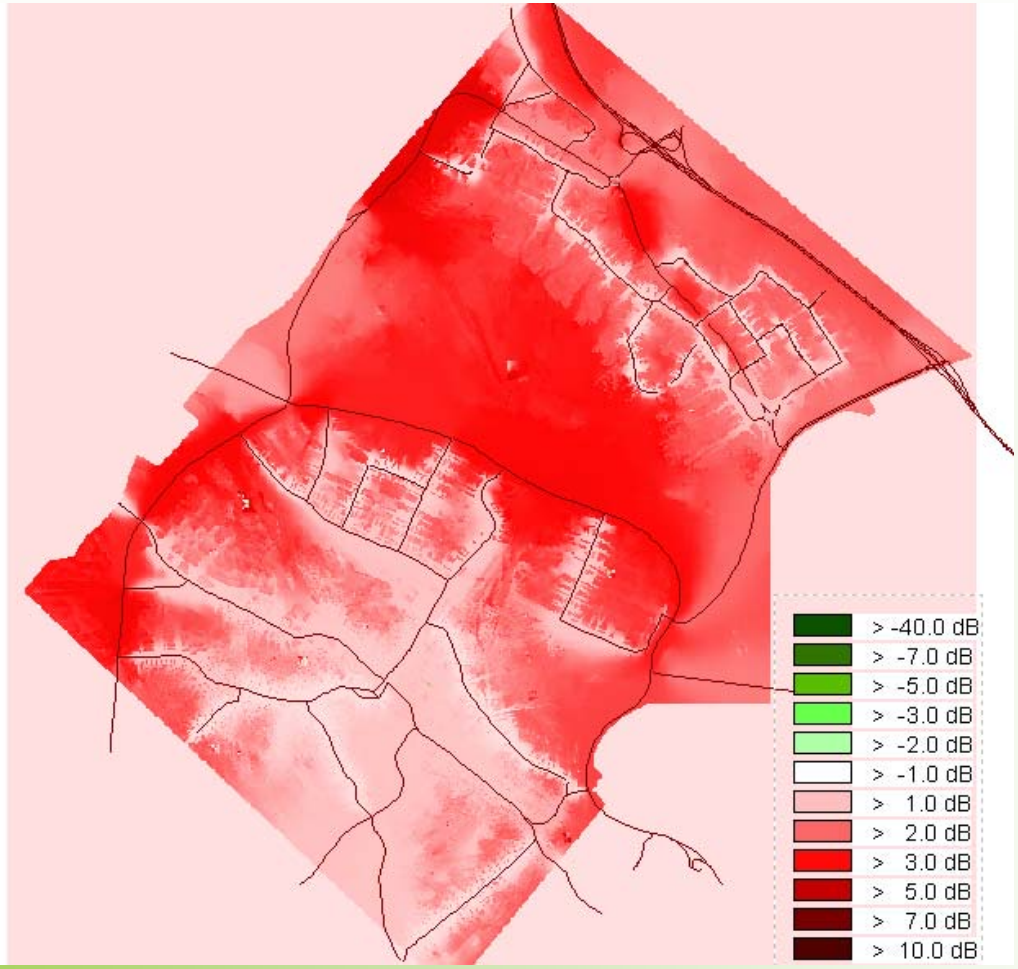
Base scenario, L_{DAY}



Receiver spacing of 10 by 10 m and a receiver height of 4 m

Noise Mapping

Difference using speed limit instead of modelled speed



Micro Simulation

At studies of:

- ✓ Driver behaviour impact on noise level
- ✓ ISA, Intelligent Speed Adaptation

Method:

- ✓ Model different driver types e.g. “Speeder”
- ✓ Vary “Speed Acceptance”

Challenge:

- ✓ Use the dynamic information of acceleration and deceleration as input to CadnaA

Ongoing Work

- ✓ Interface microscopic simulation model
- ✓ Create quiet zones (Macro simulation)