AMBM (Acoustic Model Based Monitoring)

- Model based monitoring of urban traffic noise
- Combination of calculations and measurements
- Only measuring is not sufficient. Models are needed because not everywhere can be measured and models can be used to predict, e.g. which measure is best to take
- Finally gap between acoustic modeling and measurements can be closed

Measure!  Calculate!  Measure!  Calculate!
AMBM (Acoustic Model Based Monitoring)

- Goal: Generating actual insight by means of dynamic noise map by model based monitoring of urban traffic noise

- Real time noise map, with sufficient temporal and spatial resolution to take (real-time) measures
Wat can you do with it?

- **Realistic managing** the real situation
- **Taking Real time measures:**
  - Dynamic routing
  - Dynamic speed limits
  - Dynamic closing/opening roads
  - Rejecting/promoting Vehicle classes
- **Better spreading/distribution of noise** over the city: Higher levels where allowed, Silence where obligatory/desirable like in parks
- **Better grip on policy** for reducing noise sources
- **Betere communication** to the public
- New insights make it possible to develop **alternative legislation**
Outdoor noise monitoring
The development of acoustic sensor networks gives paradigm shift for outdoor noise monitoring

Towards wireless acoustic sensor networks
Smaller, cheaper
Pilot Breda

Development and application wireless acoustic sensor network
Pilot Breda
Pilot Breda
Pilot Breda

- Central unit: Hardware configuration
Pilot Breda

› Autonomous, intelligent unit
Software

- Settings + initializations
- Control
  - Parallel measurements
  - Measurements
    - Event files
  - Post-processing
  - Sending
    - Completed datapackets
    - Timestamped parallel measurements

Remote P.C./Server
Pilot Breda

- Road tube: traffic information
- Camera: additional information about events
Pilot Breda

Data transmission using multihopping (CTP algorithm)
Pilot Breda

› Monitoring energy use/quality of network
Pilot Breda

Visualisation results
Dynamic noise maps
Sensor network The Hague
Measured noise level during one day (23-12)
Multi aspect viewer
systeem design

NDW data

VRI lusdata

FCD

Akoestisch sensor netwerk

Dynasmart

Versit

Gemodelleerde voertuigemmissies

Verkeersdata

Akoest. model

Gemodelleerd verkeersgeluid

Gemeten verkeersgeluid

Verkeersnetwerk & plattegrond

Viewer
Everything in one view
Multi aspect Decision Support Systeem (MaDSS)
MaDSS: for making policy and operation traffic management

Policy making:
- Basic rules regarding traffic flow, air quality, noise (and safety)
- Considering different interests
- Prepare choices, actual and proactive control

Operational: Operator has complex task:
- Data interpretation problems
- Insufficient knowledge about dynamics of the network (especially in situation which rarely occur)
- Complex interaction between different measures on the street
Outlook

› Extension of monitoring and modelling to network level
› Pilot of multi-aspect traffic management in the city of The Hague
› Combination of fixed and mobile sensing systems
  › Traffic data (loops / floating car data / vision)
  › Air quality
  › Noise sensors
We can not make it greener....
Thank you for your attention!

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