project nr. IST-2000-28419

deBAKOM

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HAR04MO040507dBA01

Work package: WP4

Description of database (Version VI)

Table of content

1 Database Structure

The database consists of the an Access-2000 database plus various folders for additional information like maps, arial photographs etc. (see Fig. 3)

The Access-database consists of the following tables (see Fig. 1):

- Company
- Area
- Add_area_info
- Impedance
- Sensor_Location
- Sonic_data_I (Data form ultrasonic device type I)
- Sonic_data_II (Data form ultrasonic device type II) (under construction)
- Measurement
- Rail_source
- Road_source
- MetMast_Data_I

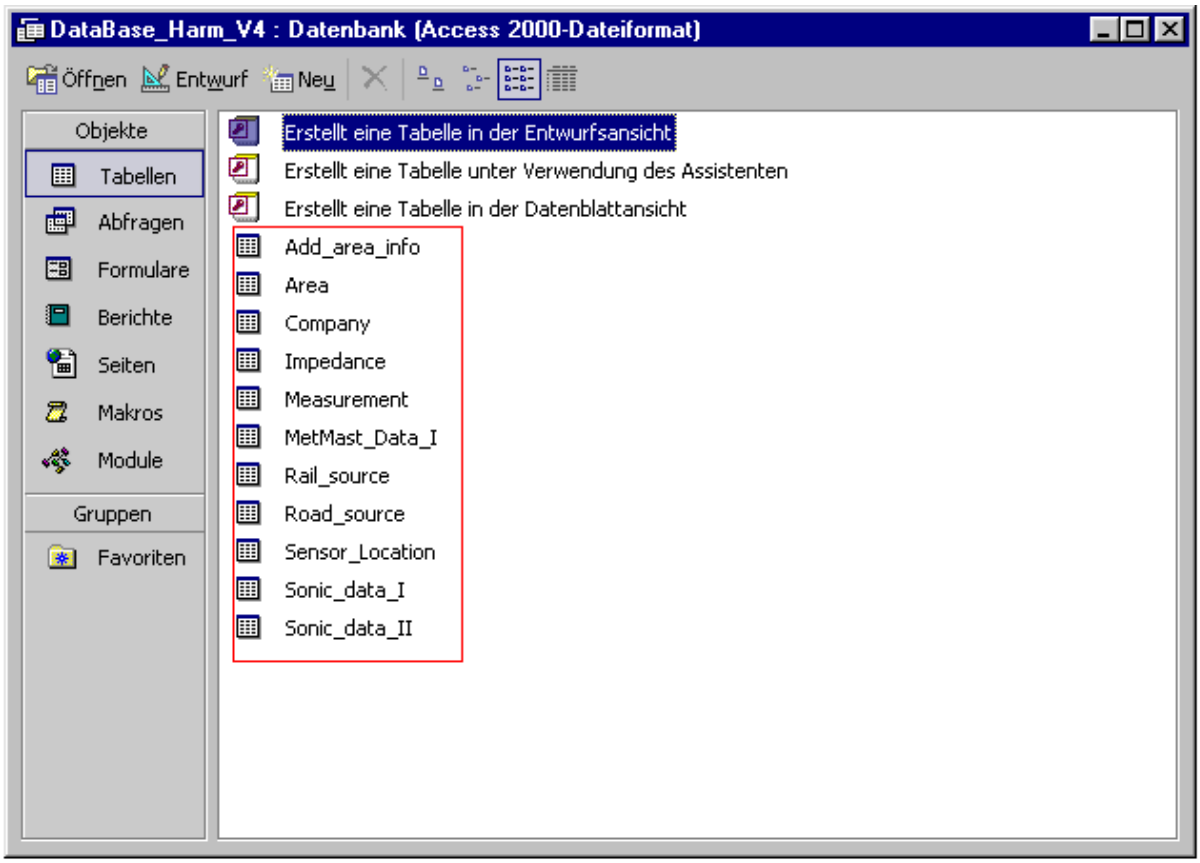

Fig. 1: Database structure

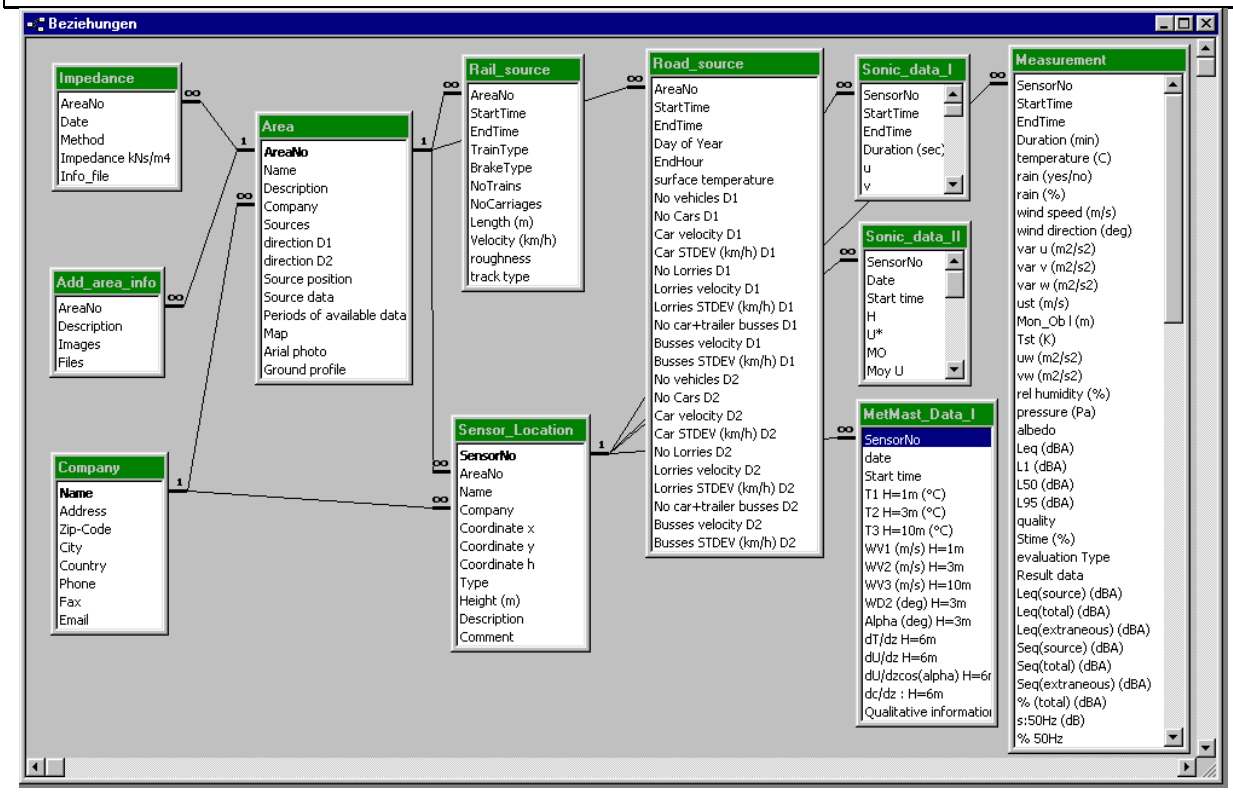

Fig. 2: Data base, tables and relations between the tables

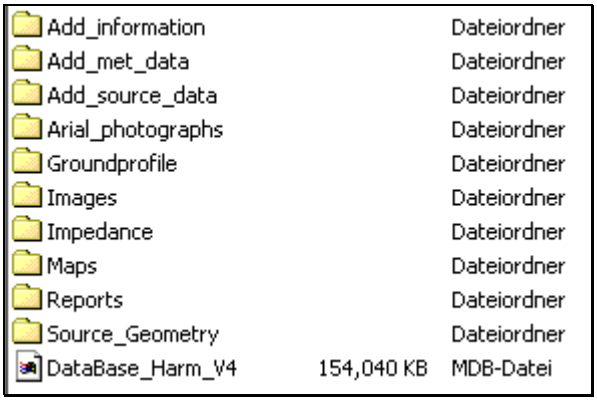

Fig. 3: File structure of external data

2 Database tables

2.1 Company

This table contains information about the company which has carried out the measurements (Name, address, e-mail, etc.)

2.2 Area

Area no:	each measurement area has a separate number (e.g. deBAKOM locations are 100-199; LCPC 1-99, etc). Not all the no. are used !
Name:	name of the area, e.g. name of measurement site
Company name:	name of the company from table company (auto select)
Description:	description of area
Source:	road or rail or loud speaker
Direction D1:	direction of traffic flow (see Source_data_road)
Direction D2:	direction of traffic flow (see Source_data_road)
Source position:	name of file with information about the position and height of the source. For a 4 lane road the file should include D1_1 x1 y1 z1 D1_1 x2 y2 z2 For each of the four lanes D1_1 is the lane closest to the measurement Position
Source data:	add. Data
Periods of av. Data:	periods of measurements in the area
Map:	name of a map for the project
Arial photo:	name of folder where arial photographs can be found
Ground profile:	name of file with info about ground profile (.dxf, Shape-files)

2.3 Sensor Location

Sensor No:	continuous no. to identify the locations in the data base
Area No:	no. of measurement area
Name:	Name of the Location e.g. name of site plus no. of site
Company:	name of company carrying out the measurements at that position
Coordinate x, y:	position of measurement equipment (x east, y north)
Coordinate h:	height of measurement site above sea level
Type:	type of sensor(s): meteo, acoustic, acoustic/met., others
height (m):	height of sensor above ground
Description:	description of site
Comment:	further information

2.4 Measurement

Different evaluation methods for the **same** data will be employed, like pattern recognition, statistical method, manual evaluation etc. The different methods are marked in the table. Out of the different evaluation method one result will be the 'best' result. This is also marked

The measurement table are:

SensorNo:	No of Sensor
StartTime:	Time of measurement start
EndTime:	Time of measurement end
Duration:	Duration of the measurement (30 min)
Temperature:	Temperature at sensor location (not sonic data !)
Rain (yes/no):	rain or no rain
Rain (%):	percentage of rain
Wind speed:	wind speed m/s (local wind speed at microphone position, mech. sensor)
Wind direction:	wind direction (local wind direction at microphone position)
Var u (m2/s2): Var v, Var w	variance of 3-D wind speed measurement m^2/s^2 (ultrasonic anemometer)
ust (m/s):	friction velocity (ultrasonic anemometer)
Mon_Ob l (m):	Monin-Obukhov length (ultrasonic anemometer)
Tst (°K):	θ^* temperature average(w'T')/ust
uw (m2/s2):	co-variance u and w
vw (m2/s2):	co-variance v and w

rel humidity (%):	relative humidity in %
pressure:	atmospheric pressure in Pascal
albedo:	albedo (reflectivity of surface)
Leq (dBA)	Leq A-weighted
L1 (dBA)	L1 A-weighted
L50 (dBA)	L50 A-weighted
L95 (dBA)	L95 A-weighted
Quality:	difference Leq(sourece) – Leq(extr. Noise)
Stime (%):	percentage of meas. time where the source could be measured/identified (only Measurement pattern !)
Evaluation type:	P = pattern, S = statistic, M = manual
Result data:	(Y)es, (N(o) estimated best result of the different evaluation methods
Leq(source) (dBA)	Leq A-weighted source level (road, rail)
Leq(total) (dBA)	Leq A-weighted (all sources)
Leq(extraneous) (dBA)	Leq A-weighted (Leq all sources minus Leq source)
Seq(source) (dBA)	Leq A-weighted source level (road, rail) from **spectra (0- 4 kHz)**
Seq(total) (dBA)	Leq A-weighted (all sources) from spectra
Seq(extraneous) (dBA)	Leq A-weighted (Leq all sources minus Leq source) from spectra
sX:	1/3 octave levels of source noise linear (50 Hz to 4000 Hz); x=1/3 octaves e.g. s:50 Hz (dB), s:100 Hz(dB), etc.
% X:	energetic ratio in %: 10^[0.1*Leq(source)]/10^[0.1*Leq(total)]*100%
eX:	1/3 octave levels of extraneous noise linear (50 Hz to 4000 Hz)

The 1/3 octave bands are taken from EN 61260
For the data base the header of the tables must correspond with the above notation !

All other inputs reference for the folders (see Fig. 3).

2.5 Road_Source

In most cases not all the data listed below will be available. In this case all other values can be set to zero.

AreaNo:	Number of measurement area
StartTime:	start of the measurement date and time
EndTime:	end of the measurement date and time

Day of year: day of the year e.g. 182 is the 182 day of the year
EndHour: end hour of the measurement e.g. 11-12 o'clock → 12
Surface temp. temp. of road surface
No vehicles D1: number of vehicles in direction D1 (see table Project)

For each class cars, lorries, busses and cars+trailer

No car D1: number of vehicles in direction D1 (see table Project)
Car velocity D1:average velocity of cars, small transporters, motor cycles in direction D1
Car STDEV D1:standard deviation of velocity
Lorries velocity: velocity of HGV > 3.5 t + HGV with trailer
Busses velocity: velocity of busses + cars with trailers

is given. This classification is due to the different velocities classes.

2.6 Rail_source

AreaNo: No. of measurement area
StartTime: start of the measurement date and time
EndTime: end of the measurement date and time
TrainType: type of train
BrakeType: type of brakes
NoTrains: no of trains of this type between Start and EndTime
NoCarriages: no of carriages
Length: length of train meter
Velocity: velocity of train km/h
Roughness of track
Track type:

2.7 Sonic_data_I

Data from the ultrasonic anemometer:

SensorNo:	No. of the sensor
StartTime:	Start of measurement
EndTime:	End of measurement
Duration:	Duration of measurement (in sec)
u,v,w:	velocity components (u north, v east, w vertical)
Ts:	temperature
Dir:	wind direction
Sos:	speed of sound
u2d	horizontal wind speed
u3d	3D wind speed
vin1-vin4:	external measurement values
sig u, sig v, sig w:	variance of wind speeds
sig Ts:	variance of temp.
sig dir:	variance of wind direction
sig sos:	variance of speed of sound
sig ud2:	variance of 2D wind speed
sig ud3:	variance of 3D wind speed
uv, uw, vw,wt:	co-variance of wind speed components/temperature
u*:	friction velocity
1/Lmon:	1/Monin-Obukhov-Length
hf:	vertical heat flow
eps:	dissipation rate (not used)

2.8 Sonic_Data_II

Data form other Sonic devices

Date	Date of meas.
Start time	Start time meas.
H	Sensible Heat (W/m2)
U*	Friction velocity (m/s)
MO	Monin Obukhov length (m)
Moy U	unrotated streamwise velocity (m/s)

Moy V	unrotated lateral velocity (m/s)
Moy W	unrotated vertical velocity (m/s)
var U	variance of streamwise velocity (m2/s2)
var V	variance of lateral velocity (m2/s2)
var W	variance of vertical velocity (m2/s2)
Vitesse	Windspeed (m/s)
Direction	wind direction/north (°)
Eta	1st rotation angle (°) average U=0
Theta	2nd rotation angle (°) average W=0
Beta	3rd rotation angle (°) vw=0
Z/L	Stability Parameter
dU/dz	Vertical gradient of wind
-T*	surface layer temperature scale (°K/m/s)
dT/dZ	Vertical gradient of temperature
alpha	Angle (°) between the wind direction and the perpendicular of the road (source-receiver direction)
dc/dz	Vertical gradient of sound celerity relative to the perpendicular of the road (source-receiver direction)

2.9 MetMast_Data_I

Meteorological data from mast measurements. Available for measurements at St. Berthevin.

2.10 Impedance

Table for impedance measurements

AreaNo:	No. of measurement area
Date:	Date of measurement
Method:	method of measurement
Impedance:	Impedance kNs/m4
Info_file:	further information

2.11 Add_area_info

This table contains additional information about the measurement area

AreaNo:	No. of measurement area

Description: description of area
Images: images of area
Files: data files

3 How to use the database

Each measurement area has a unique number and each sensor position has a unique number. The numbers of the different sites and positions are allocated to the WP4 partners as stated in the following table:

Partner	Area No	SensorNo
LCPC	0-99	0-999
deBAKOM	100-199	1000-1999
JRC	200-299	2000-2999
ARPAT	300-399	3000-3999
SNCF	400-499	4000-4999
AUTOSTRADE	500-599	5000-5999
TRL	600-699	6000-6999

Each measurement site can be identified by

- AreaNo
- SensorNo

The measurement results can be found in the table **measurement**. The Seq(total), Leq(total) is the A-weighted level over the 30 min period. Leq(source) or Seq(source) is the A-weighted level for the periods where the source could be identified. The Seq and all other S-values are derived from the AC-levels (0-4 kHz) where as the Leq an all other L-values are derived from the DC-levels.

This table contains the StartTime and EndTime of the 30min measurement interval and all the met. and acoustic data. The table is a combination of the tables measurement statistic and measurement pattern. The column evaluation type indicates which evaluation result was

used. If the evaluation type is P the Seq(source), Seq(extraneous) and the 1/3 octaves are from the pattern evaluation. For further evaluation this table can be exported (e.g. ASCII-file). The geometry of the source can be found in a separate file (see project source position).

4 Technical Remarks

Ladenburg II

In the Table Road_Source the velocities for Ladenburg 10.03.2003 to 20.04.2003 are not the measured values but values from a period 5 weeks later, since the equipment did not register the velocity during the measurement period. There is no big difference approx. ± 5 km/h.

Uttrichshausen

The traffic data for the south direction is estimated to be identical to the north !

Unna

Traffic data is only available as an average traffic flow and the daily velocity distribution for just one day.

Twistringen I

Rail data is not available for goods trains. The data is in the directory “Add_Source_data”

Twistringen II

Rail data is available in more details. The given StartTime in the table (see directory “Add_Source_data”\Twistringen_2003\) is app. the time the trains are leaving either the station Twistringen (north east of the meas. site) or Barnstorf (south west). The distance between these two stations and the site is given in the table.

Meppen I

Be aware of possible changes of the impedance due to the growing vegetation !

Meppen II

The second measurements at Meppen were carried out using a second wind screen which allows to take measurements at wind speeds up to about 5 m/s !