

SILENCE

SPA Perception and Annoyance

- IfADo (Barbara Griefahn)
- IA UAM (Anna Preis)
- SINTEF (Truls Gjestland)

Deliverable A1.1 A source library of vehicles (road and rail)

Preliminary remark. Due to the late official start of the SILENCE IP the heads of the units at *IfADo*, at IA UAM and at SINTEF had to perform the work themselves, because they were not allowed to employ personnel. This caused a small delay.

The purpose of the source library is the provision of work packages A1.2, A1.3 and A2 with noises for the creation of complex noise scenarios with typical distributions of light and heavy vehicles, of road and rail vehicles, with typical temporal structures etc.. To fulfil the respective requirements the library was planned to contain the largest possible variety of vehicles operating on roads and rails in inner cities as well as in suburbs.

SPA repetitively sent letters directly and once via AVL to the all partners of the other Sub-projects and called for contribution to this library. As the library requires high quality recordings, the letters described in detail the technical requirements concerning recordings and documentation (distance from noise source, specification of the microphones, recording mode, sampling rate, specification of road surfaces, type of street, respective buildings, speed of vehicles, weather conditions etc.). Overall, the Source Library contains 856 recordings, mainly from the partners of SP A (IfADo, IA UAM, SINTEF), additional recordings were provided by AVL (road vehicles, a tram), Bombardier (several trams), SNCF (several rail noises) and AEAT (shunting yard, road vehicles).

These noises that are listed in the following table were analysed and this analysis included among others hearing by an experienced co-worker, analysis of the temporal structure, of the frequency spectra etc.. With this procedure a large number of recordings were found to be not suitable for the construction of complex scenarios. The shortcomings were among others:

- abrupt emergence from the background
- recordings contain sequences of various vehicles
- recordings contain noises from other sources (aircraft, animals, human voices, wind ...).
- too low sampling rate.

It was therefore decided that IfADo creates a sub-library with high-quality noises only. The noises are selected according to the following criteria:

- single pass-bys (exclusion of groups of passing vehicles)
- complete recording of the pass-bys (from the time when the noise emerges until it fades away into the background)
- pure signals (not mixed with sounds of other vehicles, animals, voices or wind).
- recording mode mono, stereo recordings should be reduced to mono presentations, where the channels in which the noises occur first are selected.
- Sampling rate at least 44.1 kHz

Table 1: Source library. Number of noises related to the type of vehicles.

Source library	Number of noises			Number of noises	
Road traffic					
Single noises			Mixed road noises		
– Passenger cars (PC)	396		– Multiple PC pass bys	65	
– Special recordings	18	414	– Special recordings	7	72
– Motorcycle	100	514	– PC +motorcycles	6	78
– Trucks	59	573	– PC + trucks	29	107
– Busses	-		– PC + busses	3	110
Trams					
– Original noises	24				
– Treated noises	29	53			
– Curve and switch	5	58			
– Special recordings	17	75			
Rail traffic					
– S-Trains	10				
– Regional	39	49			
– Single engine	5	54			
– IC	4	58			
– ICE	25	83			
– Freight trains	15	98			