Soundscape Approaches
Public Space Perception and Enhancement
Drawing on Experience in Berlin

Prof. Dr. Brigitte Schulte-Fortkamp
Technische Universität Berlin
Germany
Soundscape project - a module of the project “Nauener Platz - Remodelling for Young and Old”

Framework of research program “Experimental Housing and Urban Development (ExWoSt)” [research field “Innovation of Urban Neighbourhoods for Families and the Elderly”]

Contracting entity:
- “Federal Ministry of Transport, Building, and Urban Affairs (BMVBS)”, overseen by “Federal Office for Building and Regional Planning (BBR)”

Project executing organization:
- “Regional Office Berlin-Mitte”
“Nauener Platz”
Participation of residents

working group

results „youngsters“

work material

results „girls“

land management „women“
Part I – public discussions

Part II - internal workshop

Participation of residents II
Urban Soundscaping and outdoor sound design

Classical measurements
Urban Soundscaping and outdoor sound design

binaural recordings with artificial head
Urban Soundscaping and outdoor sound design

- Points for measurements chosen from people living or working there

  The new experts (local experts)

- Examination with Soundwalks
Measuring points “Nauener Platz”

Schematic overview measuring points

Modelized area (“Cadna A” / DataKustik)
Measuring point 1 (near crossroads “Reinickendorfer Street” / “School Street”)

Calculated noise map
Measuring point 1 (near crossroads “Reinickendorfer Street” / “School Street”)

Spectra (linear / A-weighted), „Artemis“ / HEAD acoustics

Results from rating (measuring point 1)
Measuring point 6
(Entrance “Reinickendorfer Street”)

Calculated noise map
Measuring point 6
(Entrance “Reinickendorfer Street”)

Spectra (linear / A-weighted), „Artemis” / HEAD acoustics

Results from rating (measuring point 6)
Measuring point 8
(projected rest area)

Calculated noise map
Measuring point 8
(projected rest area)

Spectra (linear / A-weighted), „Artemis“ / HEAD acoustics

Results from rating (measuring point 8)
Narrative interviews

- 7 single interviews
- 1 group interview
- approximate 2 – 3h
Data analysis

- Sound pressure levels (weighted, linear, averages, maxima)
- Calculation related to noise maps
- Spectral and psychoacoustical analysis based on binaural recordings
- Rating scales analysis
- Analysis of short-time descriptions and detailed interviews (qualitative analysis based on “grounded theory”)
Indicators and meanings

… instead of “just silence”:

- Harmony

- Acoustical home
Tendencies and results

- Sound pressure level dB(A) decreases with increasing of distance (referring to calculation), but projected rest area is characterized through low frequency noise

- Green influences the meaning of noise

- Requests for “Green Acoustics” (singing birds, watersounds) for the projected “audio island”
Installation of the sounds

Sound devices, Barbara Willecke
Sound masking based on proposals of the new experts

1. cross road
2. new entrance
3. Café Naumi
4. kindergarten
5. walk through
6. entrance reinickendorfer st.
7. playground
8. projected rest area

- traffic noise at playground
- traffic noise + forest birds
- traffic noise + city birds
- traffic noise + shingle beach
Sound masking based on proposals of the new experts

Spectra of masking sounds, „Artemis“ / HEAD acoustics
Installation of the sounds
Conclusions

• The challenge here is the collaboration

• Binaural acoustic measurements and evaluation through the new experts brought up the information about the prominence of low frequency noise

• Balancing between acoustic measurements, architectural planning and the expertise from people living in the area leads to a new understanding and concept of a public place – the new Soundscape
Impressions “Nauener Platz”
Validation of the psychoacoustic infrastructure of a public space in Berlin based on the concept of Soundscape

V. Acloque, B. Schulte-Fortkamp
Nauener Platz before and after
Methods and Tools

- Binaural measurements
- Soundwalk with residents and non-residents
- 9 Interviews
Results: Achievement of major goals

- New kind of users:
  - more families
  - Kindergarten classes in the morning

SECURITY FEELING
Various sound atmospheres

- Interviews results:
  - Traffic = still dominant noise source
  BUT
  - Human sounds: increased but more lively
  - Importance of natural sounds (real or artificial from the sound installations)

Switching from lo-fi to hi-fi Soundscape
Subjective loudness and pleasantness

As one could expect, the further one is from the traffic, the more peaceful the ambience is.
One example: the rose garden (1/2)

- The most quiet area despite the remaining traffic noise

Traffic noise + metro vibrations
One example: the rose garden (2/2)

• Some quotes about this location:
  – “traffic disappears, birds are really present, wind in the trees, small oasis“
  – “it’s the most pleasant and the most quiet place“
• Also well accepted by seniors
  – “one can simply seat here without a kid, lie on a deckchair or seat on the bench. It isn’t only relying on the playground”
The gabion wall

- Standard noise-abatement-wall inappropriate
  - Max. height: 1.50 m
- User-oriented solution
  - Along the playground
  - Benches for parents directly behind the wall.
Impact of the gabion wall

Gain of max. 6 dB between 200 Hz and 1 kHz (i.e. rolling noise)
Remaining issue: the football field

- New organisation: a closed field for football and an open one for basketball
- Metallic wire mesh around the field
- Burning point for generational conflicts
  - For retired people, it is acceptable to play football (even if it is loud) but not to shoot against the wire mesh as hard as possible.
  - For young people: playing is fun but the noise of the barrier is a good indication to know who is the strongest
High peaks for all psycho-acoustical parameters (like sharpness on the left)
Conclusion

• Good acceptance of the new place, especially the peaceful area

• Traffic noise is still dominant but became lower thanks to:
  – Other more pleasant sources
  – The gabion wall