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

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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”]

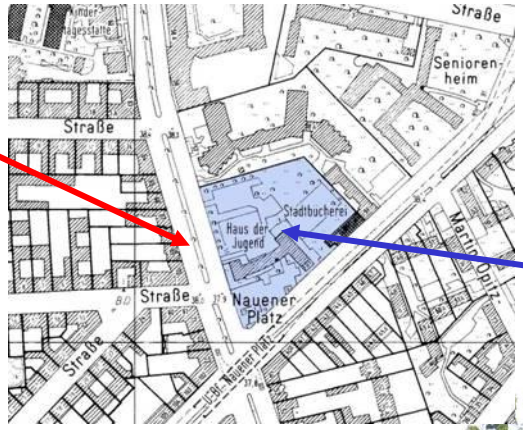
Contracting entity:

- “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”

Reinickendorfer Street



“Nauener Platz“

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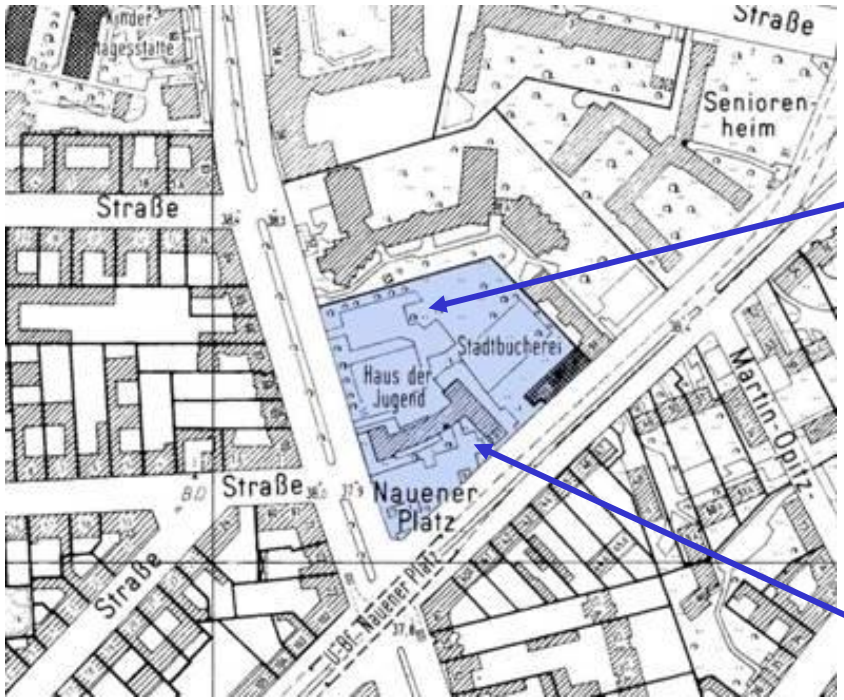
“Nauener Platz”



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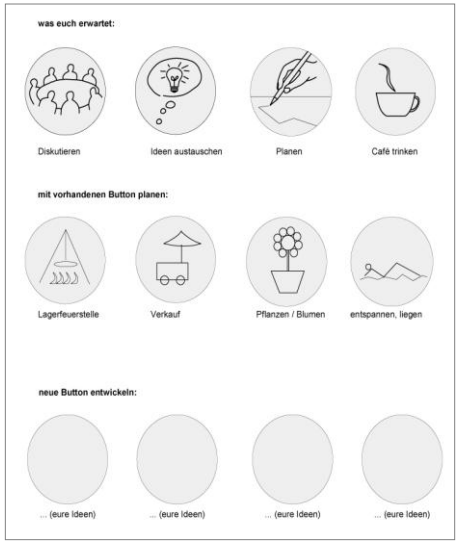
Participation of residents

working group

results „ youngsters“



work material

results „girls“

land management „women“

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Participation of residents II

Part I – public discussions

Part II - internal workshop

Urban Soundscaping and outdoor sound design

Classical measurements

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Urban Soundscaping and outdoor sound design

binaural recordings with artificial head

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Urban Soundscaping and outdoor sound design

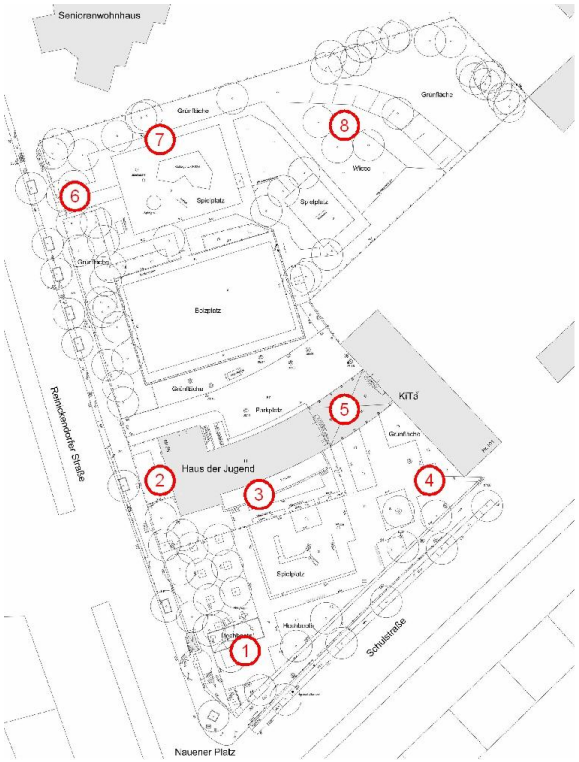
- Points for measurements chosen from people living or working there

The new experts (local experts)

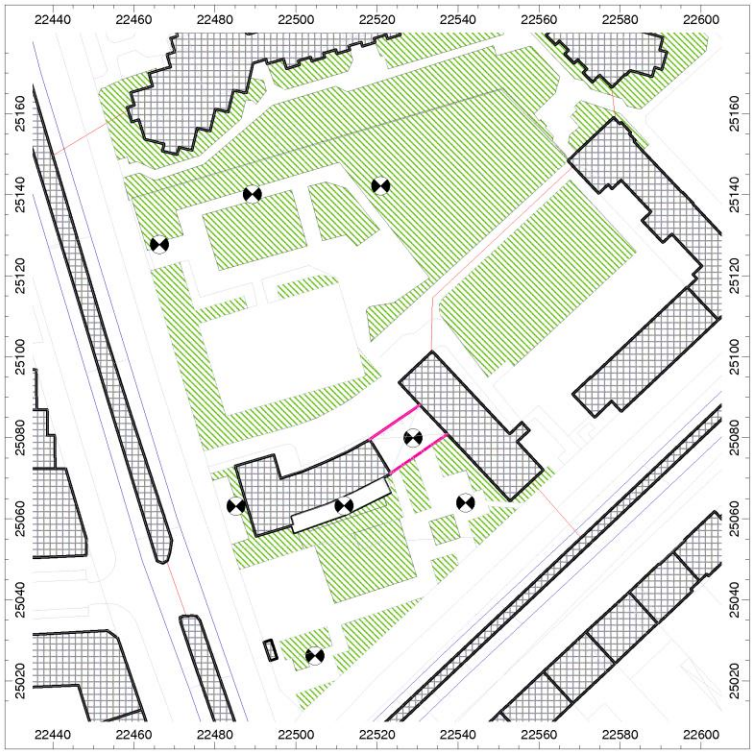
- Examination with Soundwalks

Soundwalks

Measuring points “Nauener Platz”



Schematic overview measuring points



Modelized area (“Cadna A” / DataKustik)

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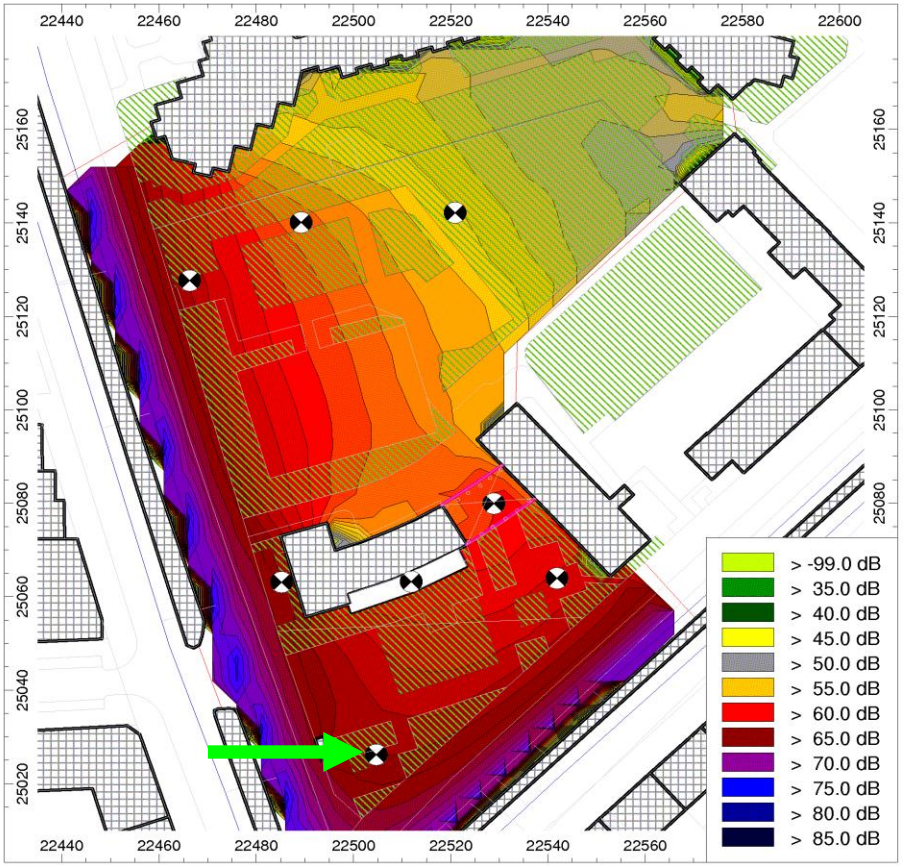
Measuring point 1 (near crossroads “Reinickendorfer Street” / “School Street”)



Calculated noise map

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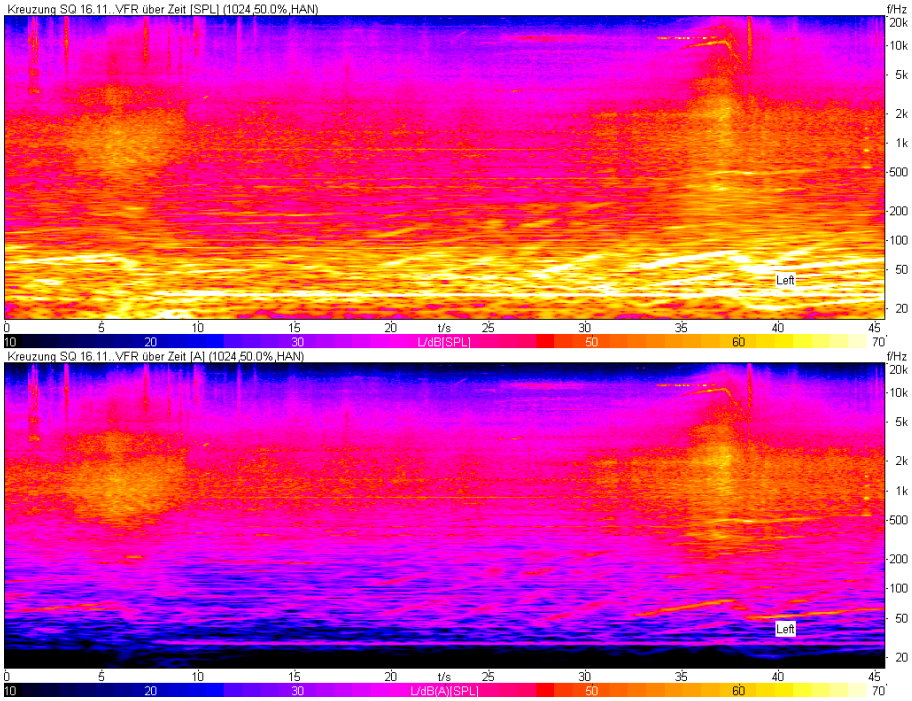
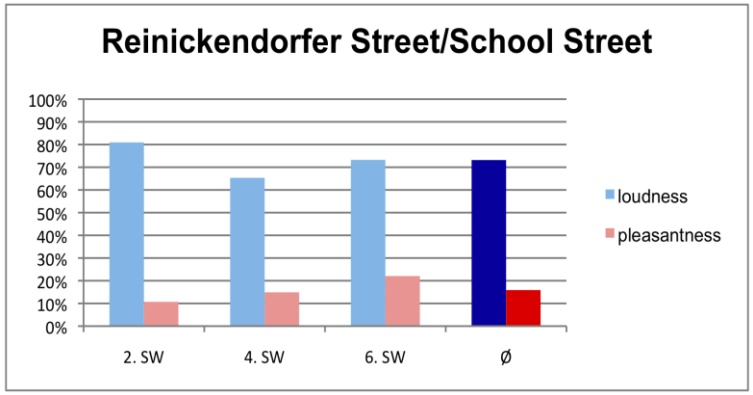


Spectra (linear / A-weighted), „Artemis“ / HEAD acoustics



Results from rating (measuring point 1)

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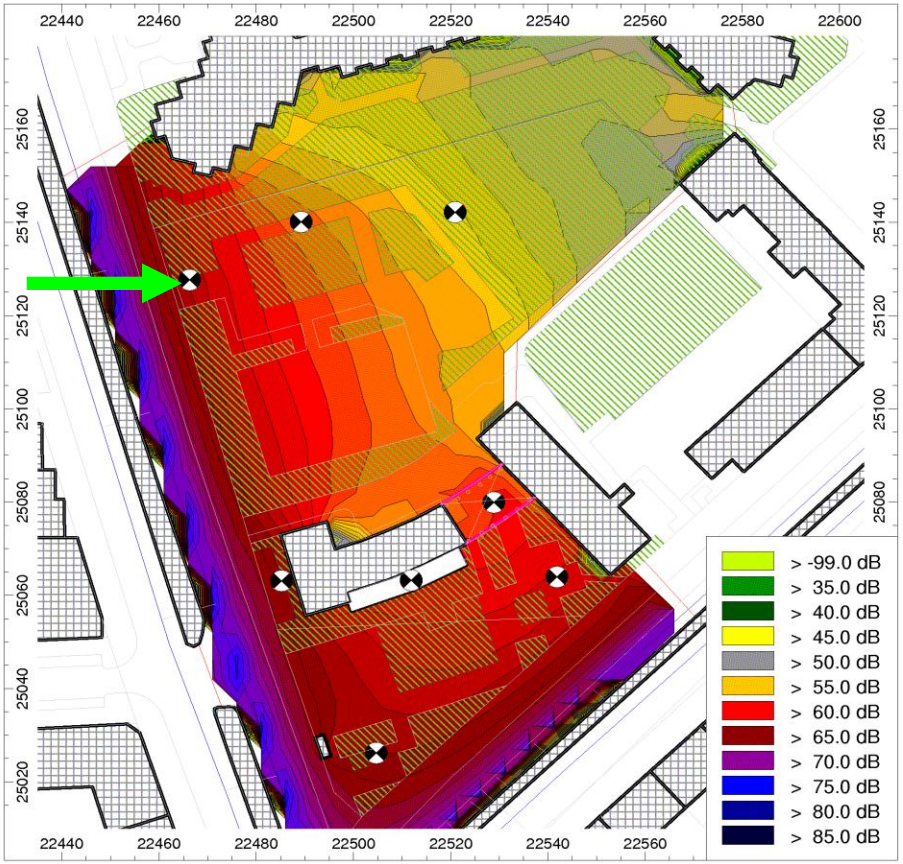
Measuring point 6
(Entrance “Reinickendorfer Street”)



Calculated noise map

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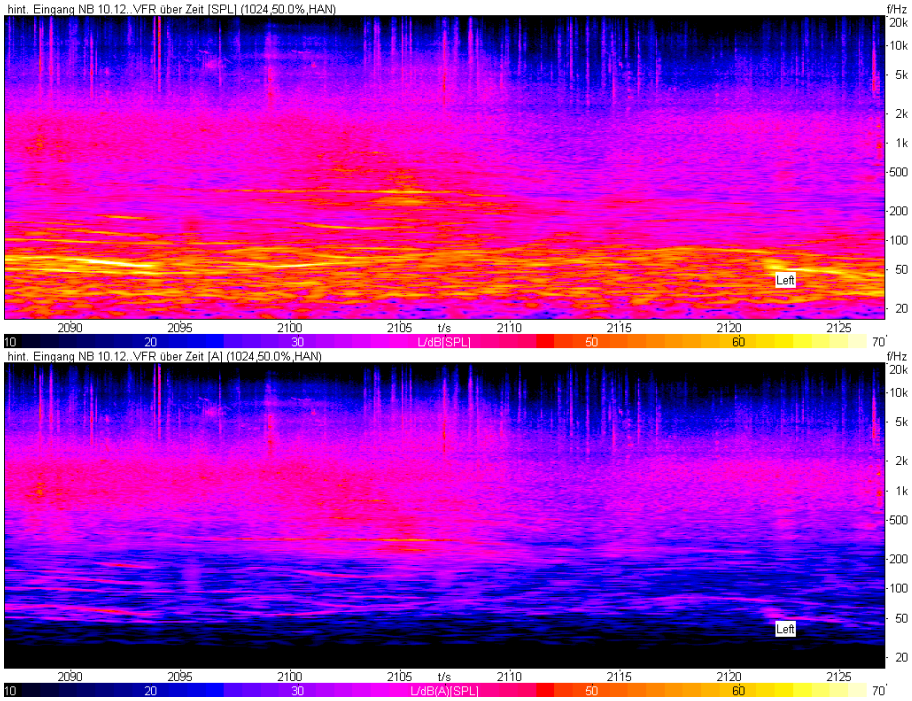

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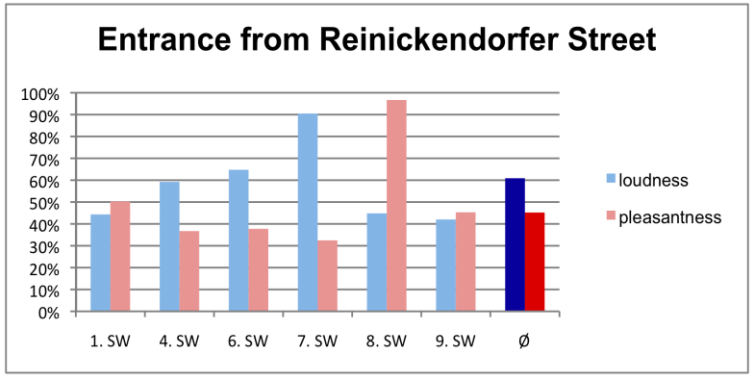
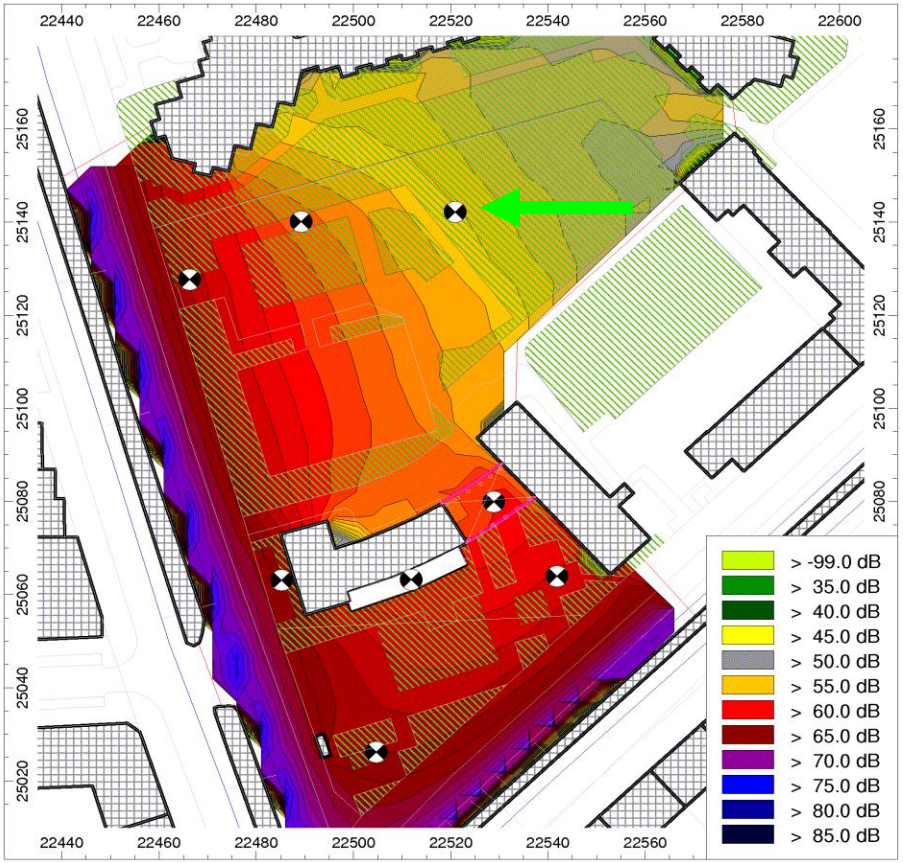


Results from rating (measuring point 6)

Measuring point 8
(projected rest area)



Calculated noise map

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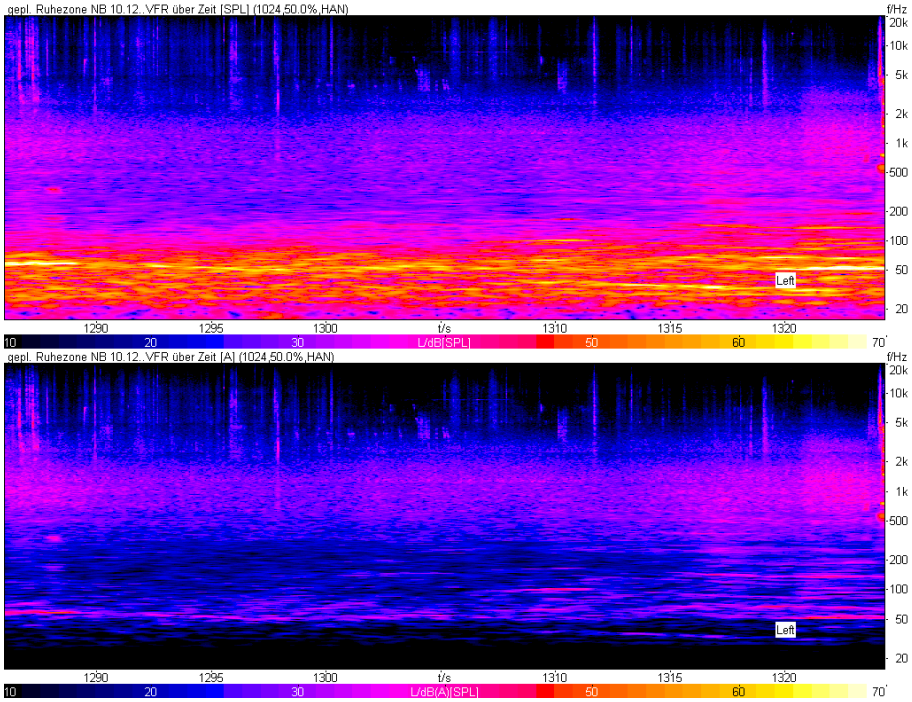
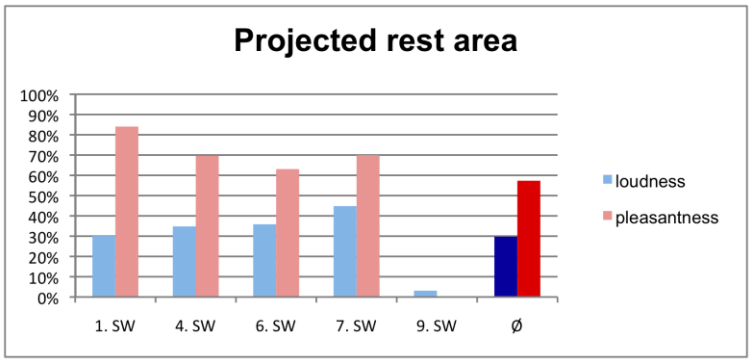
Measuring point 8 (projected rest area)



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



Results from rating (measuring point 8)

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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
- Sprectal 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

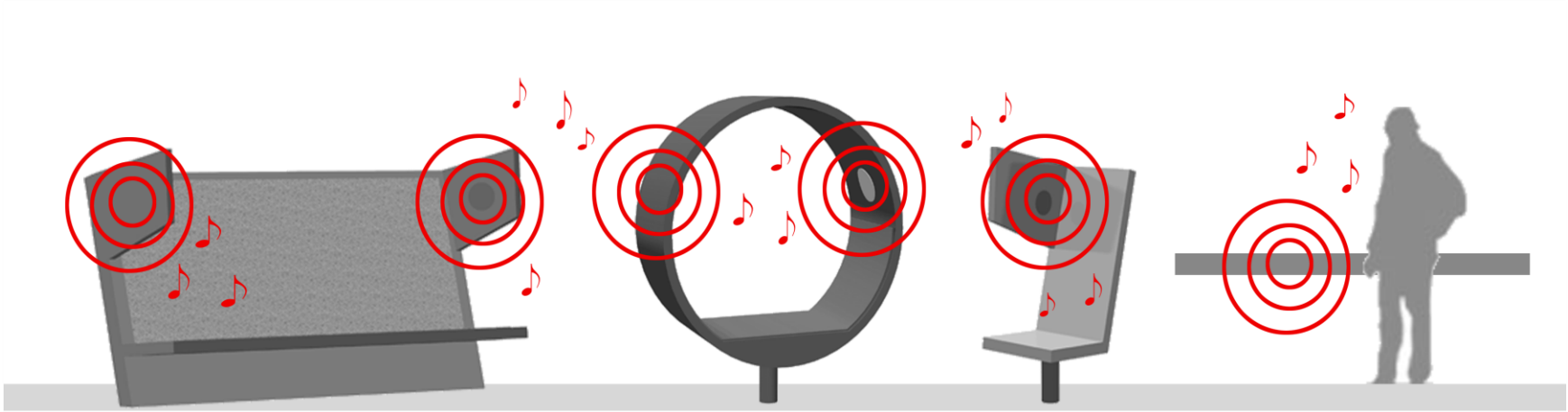
Tendencies and results

- 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

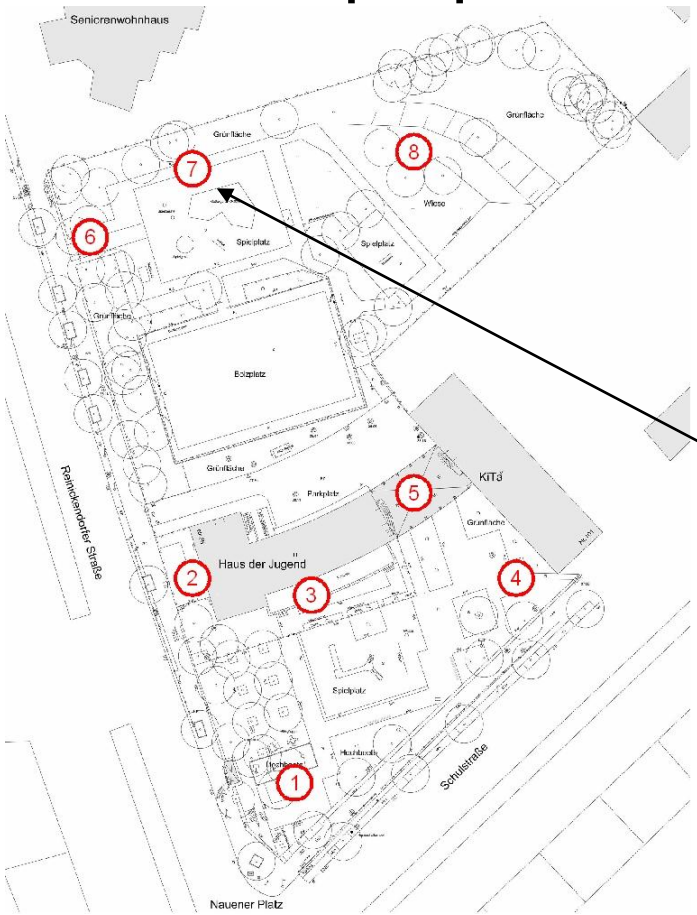
- Requests for “Green Acoustics” (singing birds, watersounds) for the projected “audio island”

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 kindergarden
⑤ walk through
⑥ entrance reinickendorfer st.
⑦ playground
⑧ projected rest area

traffic noise at playground

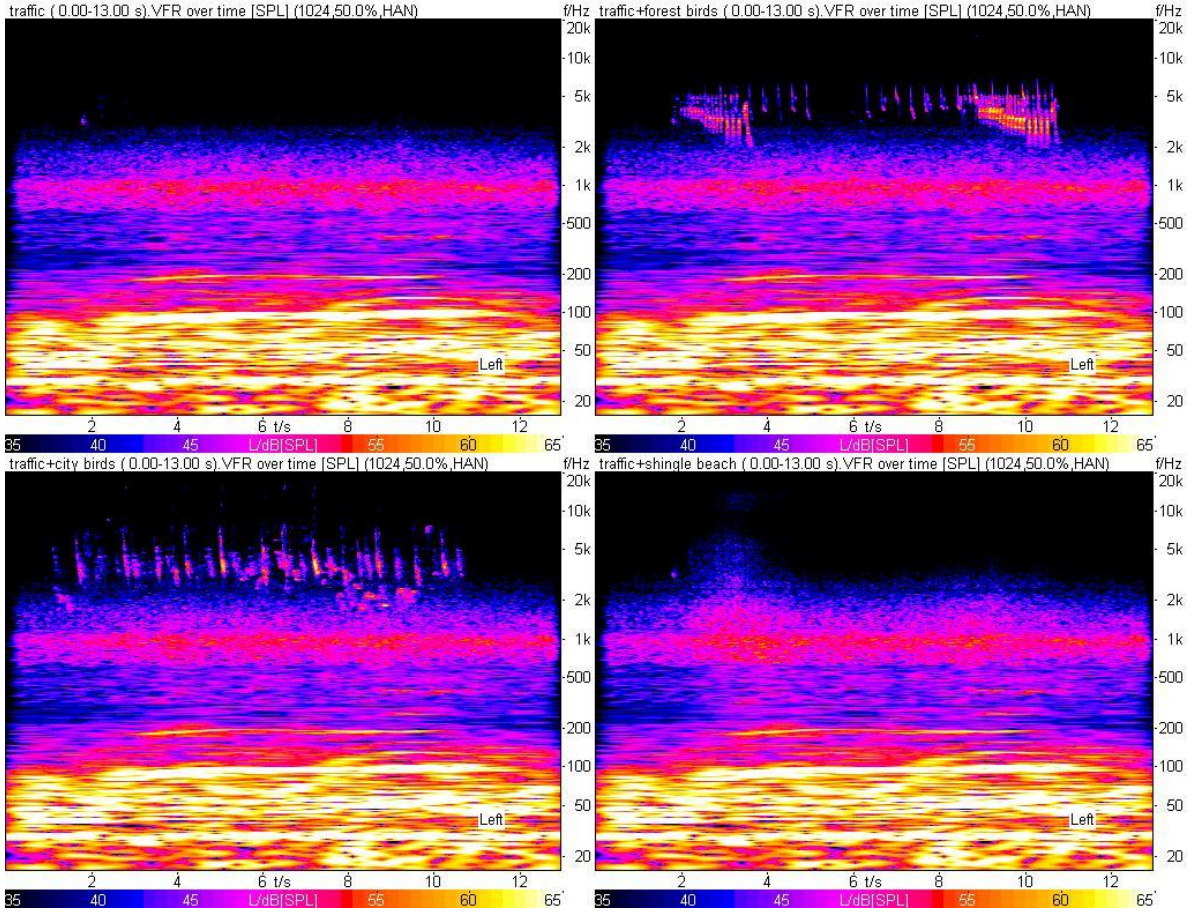
traffic noise + forest birds

traffic noise + city birds

traffic noise + shingle beach

Stop

Sound masking based on proposals of the new experts



Spectra of masking sounds, „Artemis“ / HEAD acoustics

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Installation of the sounds

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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”

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Validation of the psychoacoustic infrastructure of a public space in Berlin based on the concept of Soundscape

V. Acloque, B. Schulte-Fortkamp

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Nauener Platz before and after

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Methods and Tools

- Binaural measurements
- Soundwalk with residents and non-residents
- 9 Interviews

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Results: Achievement of major goals

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

SECURITY FEELING

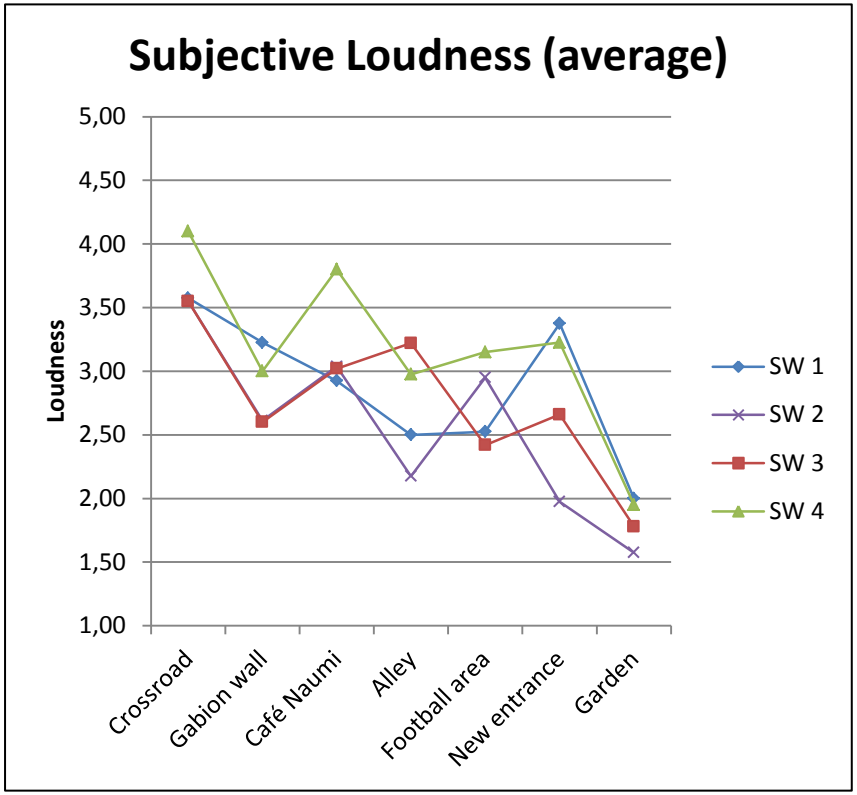
Various sound atmospheres

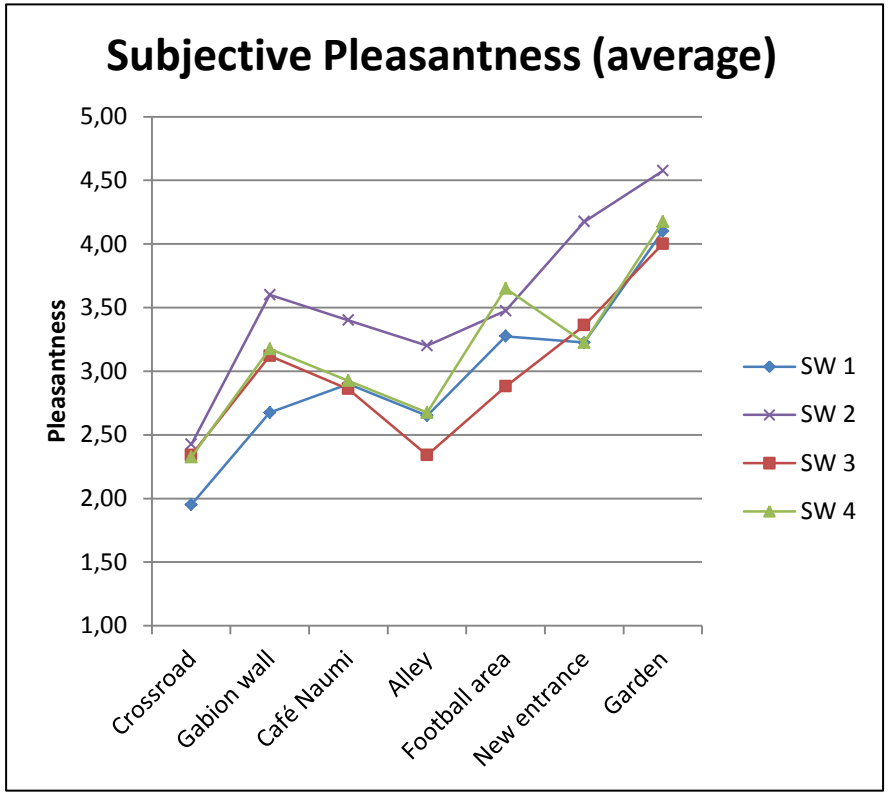
- Interviews results:
  - Traffic = still dominant noise source

  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

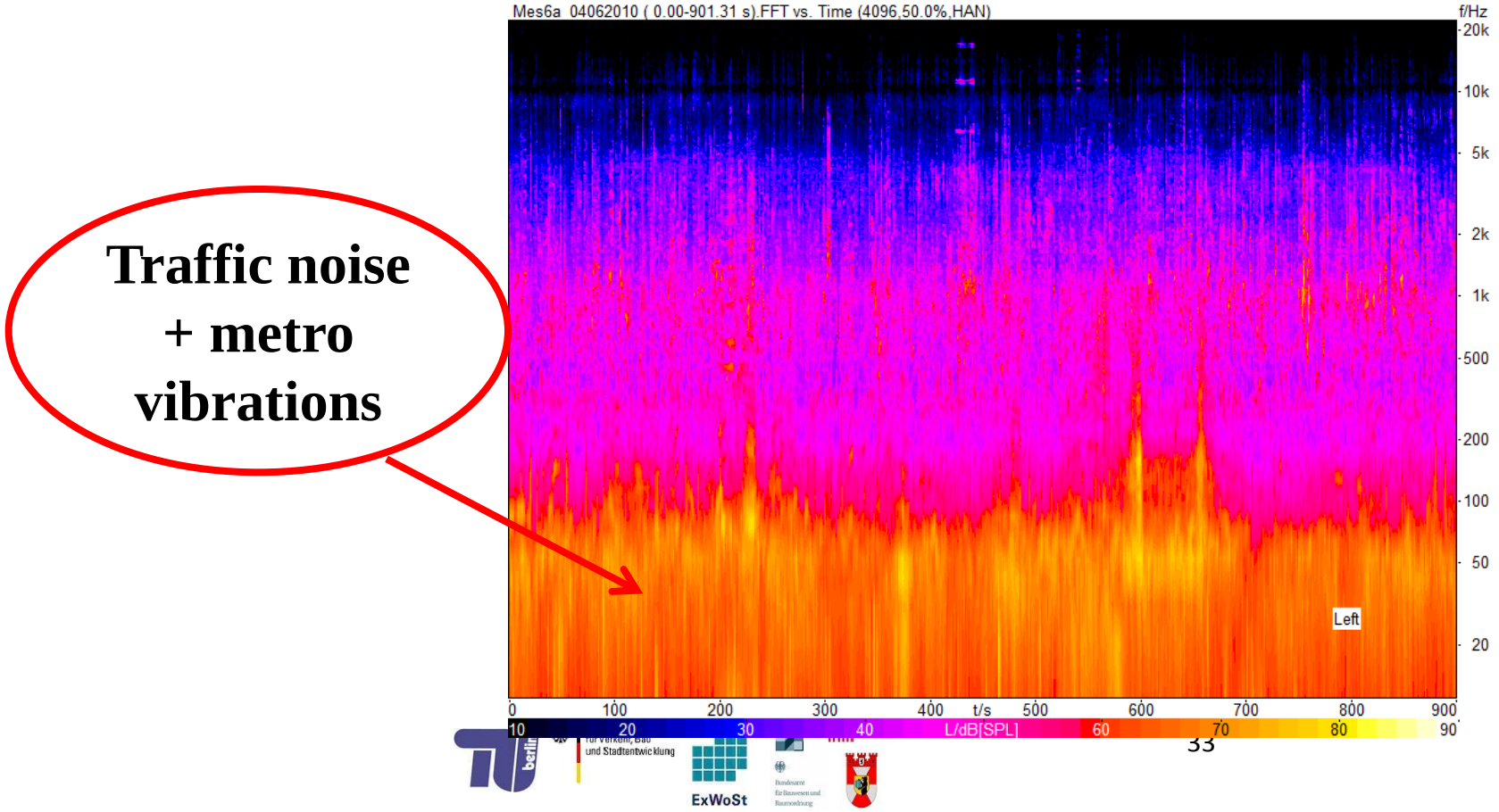




As one could expect, the further one is from the traffic, the more peaceful the ambience is

One example: the rose garden (1/2)

- The most quiet area despite the remaining traffic noise



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.

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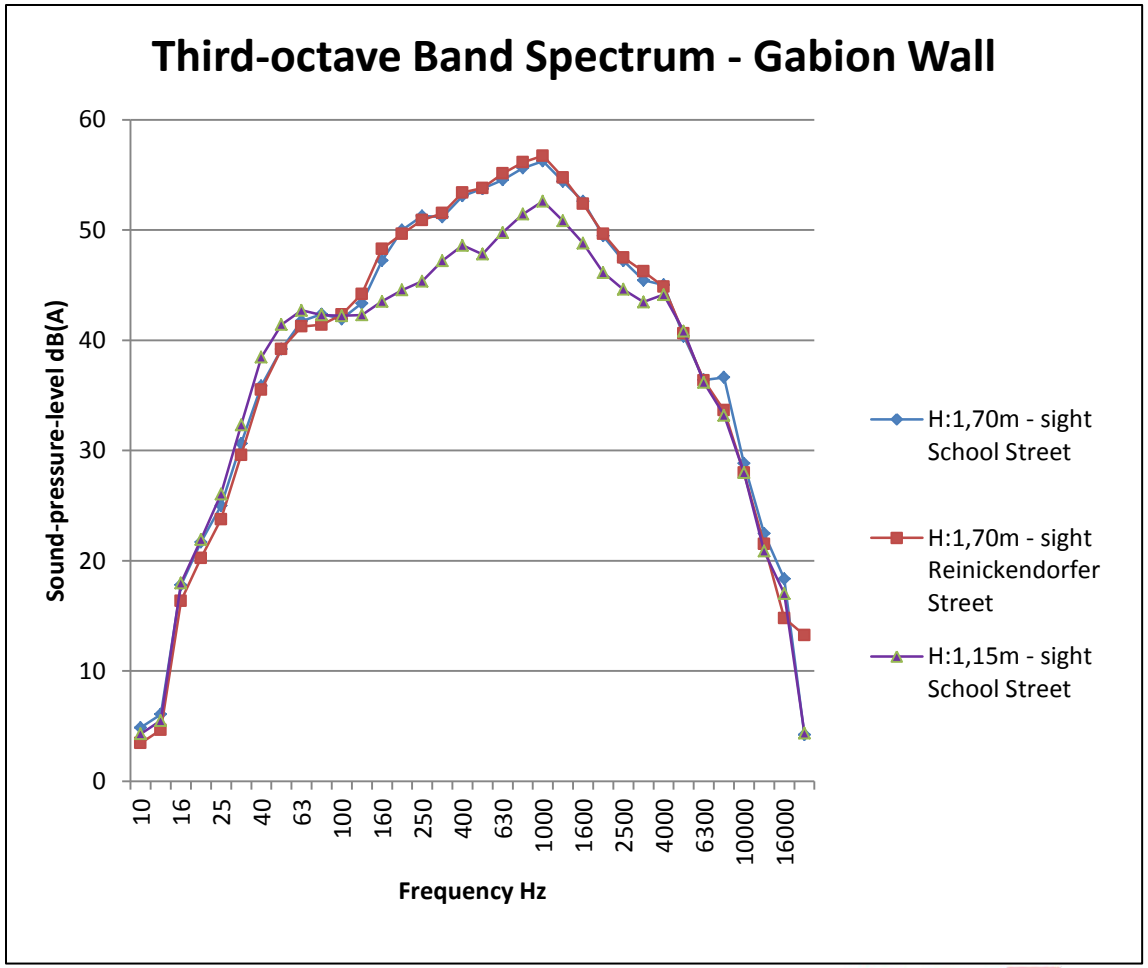
Impact of the gabion wall

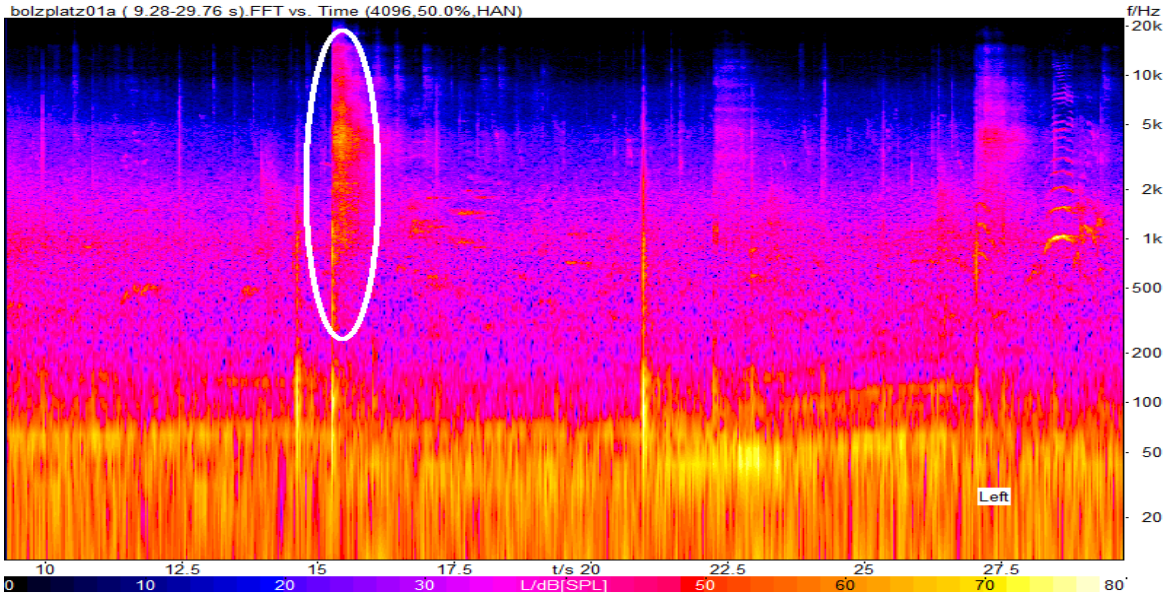


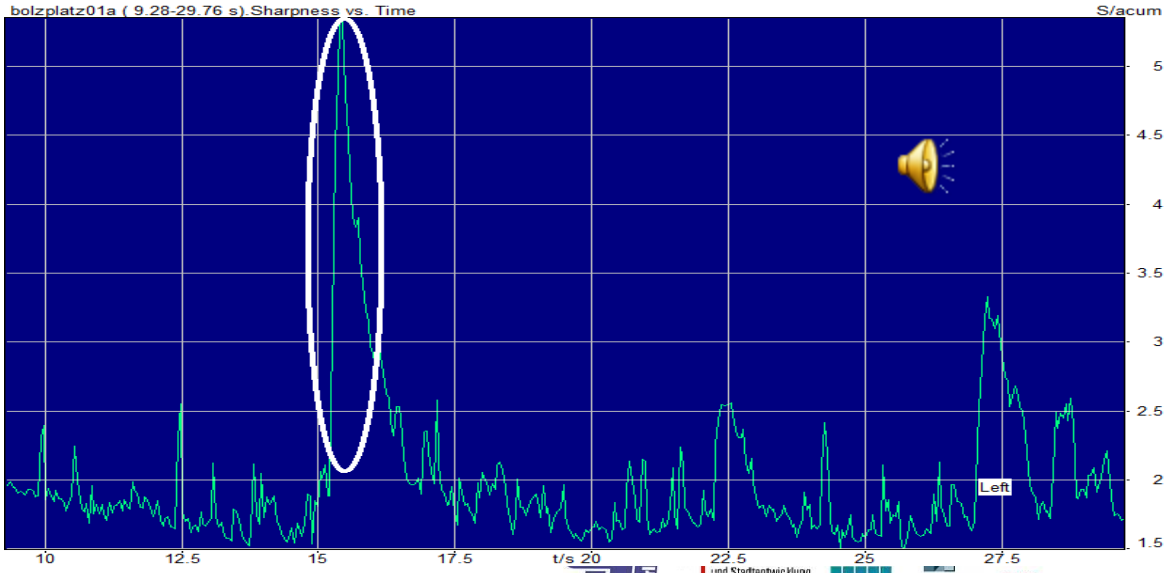
Gain of max. **6 dB** between 200 Hz and 1 kHz (i.e. rolling noise)

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

Football field (1/2)





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