SVANTEK

Road Traffic Noise Monitoring with Analysis of Building Acoustic Shielding

CASE STUDY: Multi-Point Noise Measurements in a Residential Area in Warsaw

Measurement Operator: SVANTEK Consultants

Measurement Equipment:
SV 279 PRO – Noise Monitoring Station with SVAN 979 Sound Level Meter
SV 277 PRO – Noise Monitoring Station with SVAN 977 Sound Level Meter
SvanPC++ Software

Challenge:
To evaluate the actual noise levels from road traffic in a mixed-use residential area and assess the real impact of building acoustic shielding on noise propagation, in compliance with applicable environmental protection regulations.

Multi-Point Noise Monitoring Case Study

Traffic noise remains one of the most critical environmental factors affecting urban quality of life. Both national and EU regulations mandate regular environmental noise monitoring, especially in residential zones.

This case study presents a comprehensive noise assessment performed in Warsaw's Wawer district — an area characterized by dynamic development and significant road traffic exposure. The goal was to evaluate how local building structures influence sound propagation and overall noise levels in the environment.

Objective of the Study

The main goal was long-term noise monitoring along Przewodowa and Strzygłowska streets, both with heavy traffic. The study focused on:

- Analyzing noise fluctuation patterns in relation to meteorological conditions.
- Measuring environmental noise levels during both daytime and nighttime.
- Assessing the effectiveness of a residential building as an acoustic barrier.
- Verifying compliance with legal environmental noise limits (LA_{eqD} 61 dB, LA_{eqN} 56 dB for single-family housing).

Measurement Locations and Setup

Two strategically selected monitoring points enabled comparative analysis:

Point P1 — Located directly next to the road, at the façade of a residential building on Strzygłowska Street, representing conditions without acoustic shielding.

Point P2 — Positioned behind the building, on the premises of Svantek's facility, approximately 4 meters above ground, within the potential acoustic shadow zone.

This setup allowed direct observation of the building's shielding effect on noise levels as a function of distance from the source.

Measurement Methodology and Equipment

Measurements were carried out continuously for seven consecutive days using Svantek's certified noise monitoring stations:

SV 279 PRO + SVAN 979 (P1)

SV 277 PRO + SVAN 977 (P2)

Data was recorded with a 1-second time resolution, capturing both acoustic parameters and meteorological conditions. Using 3G connectivity, the data was transmitted to an FTP server and analyzed with **SvanPC++ EM** software, offering features such as:

Identification of sound events based on audio recordings.	Filtering of incidental sounds (e.g., aircraft, barking dogs).	Calculation of key acoustic indicators, including LAeq D, LAeq N, and LA95.

Measurement Results and Interpretation

Daytime (06:00–22:00)

On the noisiest observed weekday (Thursday), the recorded equivalent continuous sound levels were:

58.7 dB at P1 (direct exposure)	**48.5 dB at P2** (shielded location)

The recorded **10.2 dB** reduction confirms the significant acoustic shielding effect of the building — a key insight for urban planning and noise management.

Nighttime (22:00–06:00)

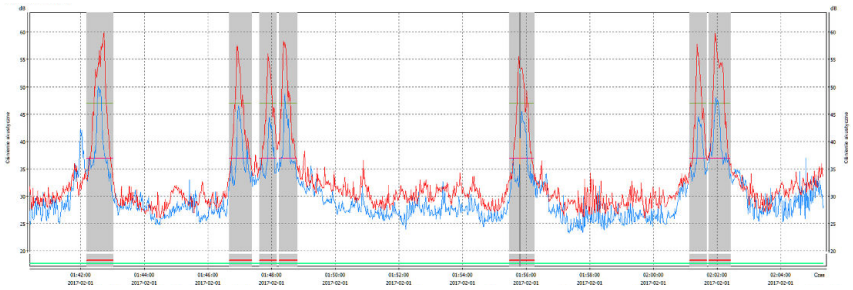
During the nighttime analysis, which included the identification of individual vehicle passages, the measured noise levels were:

47.5 dB at P1 (direct exposure)	**37.2 dB at P2** (shielded location)

The shielding effect persisted during nighttime with a reduction of approximately **10.3 dB**, confirming the building's role in mitigating traffic noise impact around the clock.

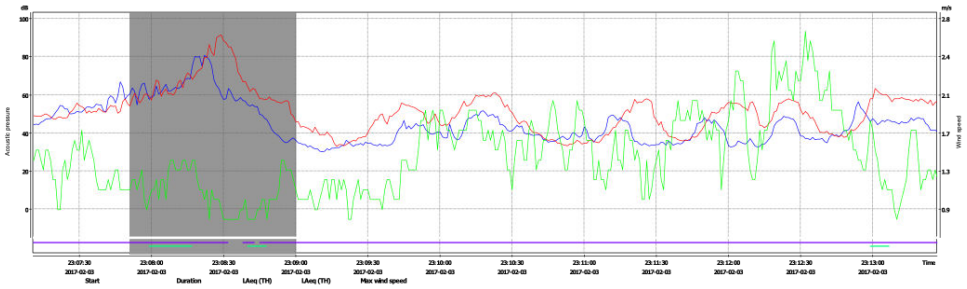
Conclusions and Summary

This project demonstrates the effectiveness of multi-point environmental noise monitoring using advanced Svantek systems. The high-resolution, continuous recording combined with the powerful analysis capabilities of **SvanPC++ EM** ensured full control over the measurement process and data interpretation.



Detailed view of acoustic events (car passages) at observation points P1 and P2 with determined acoustic levels LAeqN for the night-time period (8 hours).

Marked aircraft overflight.



Key Findings include:

Buildings can serve as effective acoustic barriers, reducing noise levels by approximately **10 dB**.

Continuous monitoring with real-time data analysis is an essential tool for authorities, investors, and environmental consultants.

Professional noise monitoring stations provide reliable, precise data for both regulatory compliance and detailed environmental assessment.

The results not only confirmed regulatory compliance but also provided valuable data for further comparative studies and informed decision-making aimed at improving urban acoustic environments.

Scan for more information about SVANTEK Multi-Point Noise Monitoring Solutions!