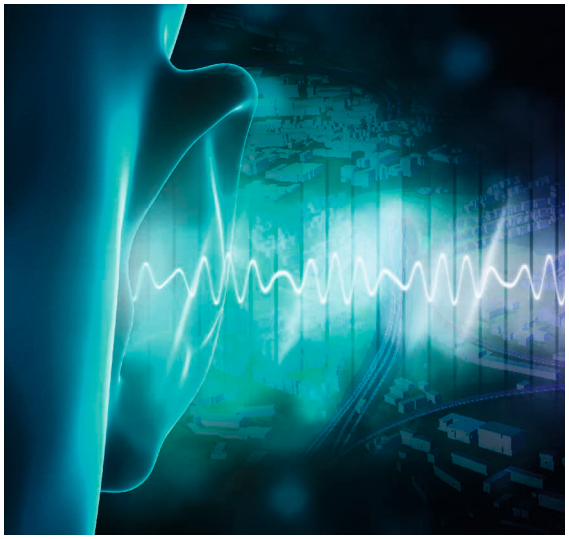
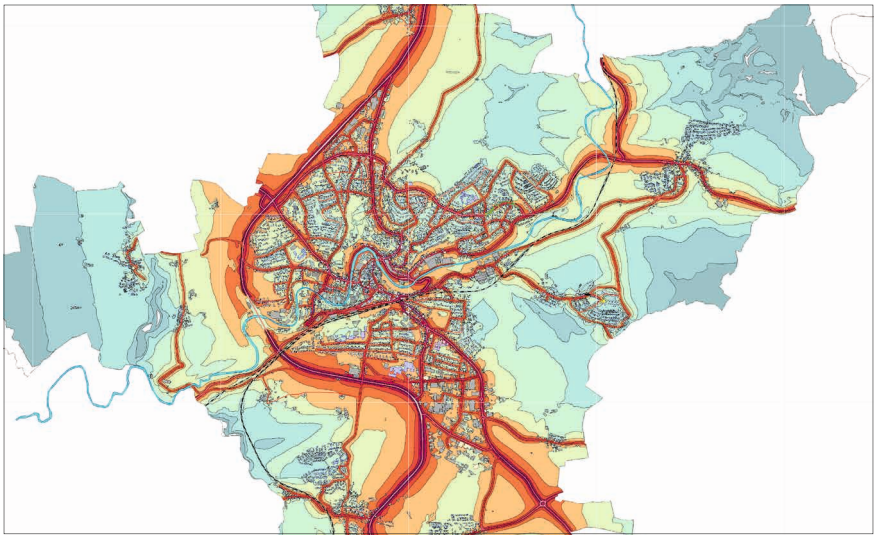
SoundPLAN® noise





Highlights SoundPLANnoise

Modeling
Fast and efficient! Use multiple external data sources to import geographic data models intuitively and manipulate them easily.

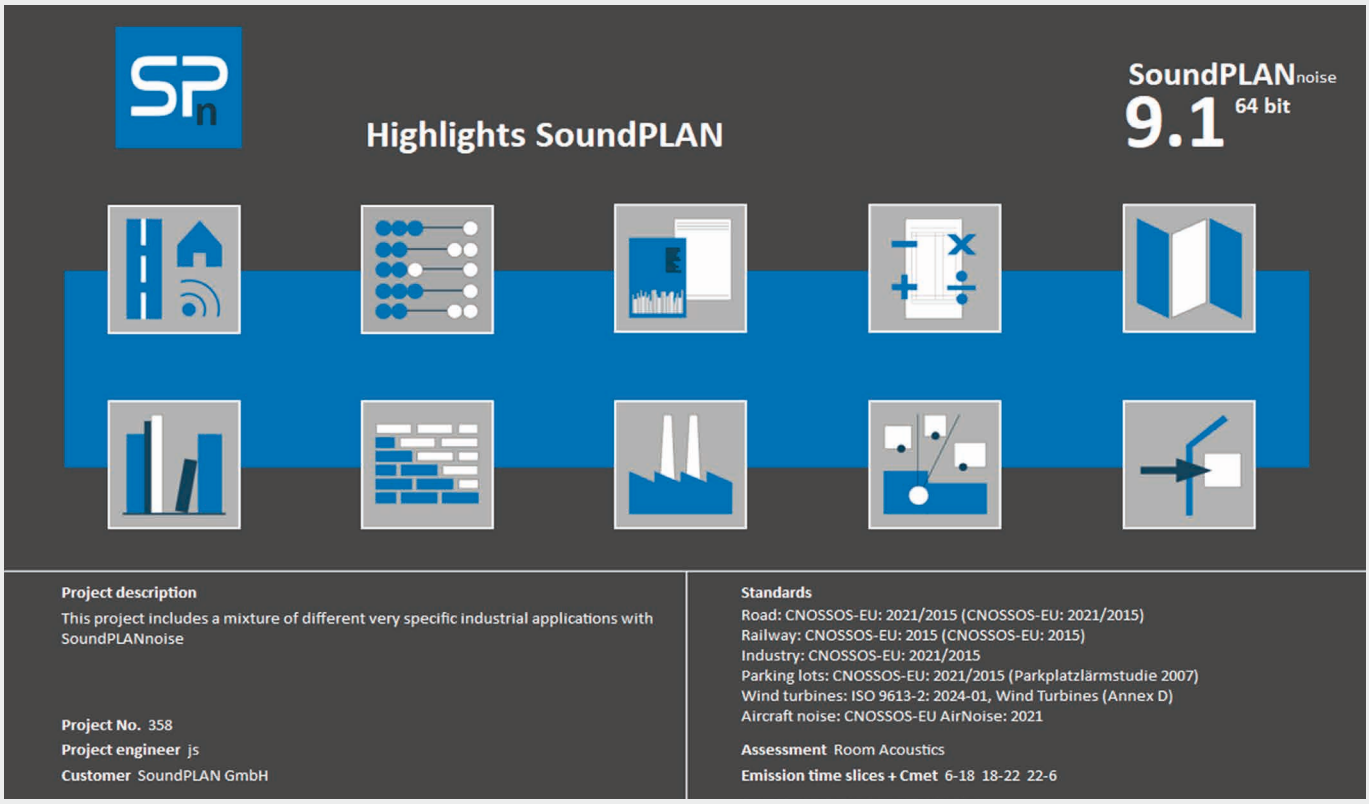
Calculation methodology
Fast and advanced dynamic search algorithms using the full potential of your computer or your network.

Result documentation
No need to export results to multiple different documentation tools. All you need (tabular or graphical result documentation) is available directly in SoundPLANnoise.

Convenient analysis and optimization tools
Use the suitable tool for different applications and find the best solution in any case.

Highlights SoundPLANnoise

The continuous development of SoundPLAN is carried out by an innovative team of software developers and experts who take into account the needs of both customers and policy makers, and as a result are able to respond quickly and competently to user requirements. SoundPLANnoise offers separate, independent programs for modelling, calculation, spreadsheets, graphics and noise reduction tools - focused on the specific task at hand. This enables precise workflows with the efficiency bonus of being able to continue working on the same or other projects while, for example, an additional calculation is being carried out in the background. With SoundPLANnoise, all globally relevant calculation guidelines in the field of environmental acoustics, occupational health and safety, and passive noise protection are available to you - new guidelines are implemented as quickly as possible and made available as a free update for all customers with a maintenance contract.

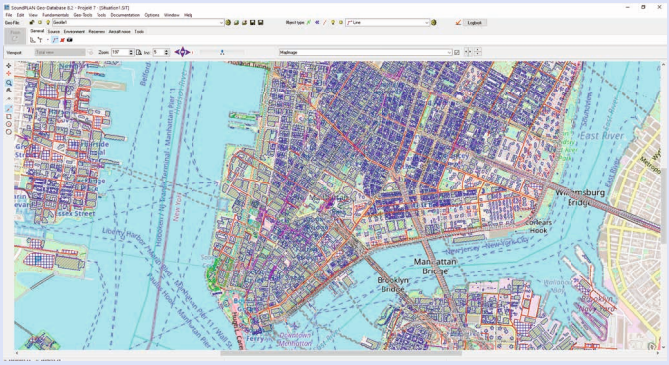


Modeling

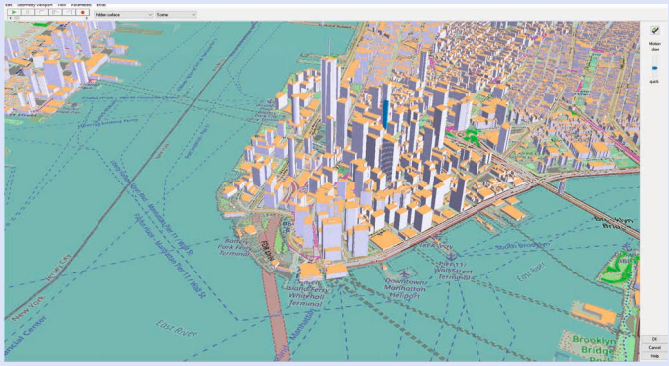
Data preparation and modeling has never been easier and clearer than with SoundPLANnoise. Countless tools are available for efficient data preparation along with the ability to maintain an overview of your planning variants with the transparent situation concept, even in large projects. Importing from a wide variety of data sources into the corresponding SoundPLAN objects and flexible object definitions with varying properties leads to an efficient working method with minimum effort. In the case you do not have any digital data available, you can use the integrated interface to Google and Open Street Maps, which provides the direct import of terrain and other geospatial data. Another option is the use of a WMS server as the basis for modeling. Direct access to such map services is also invaluable for data preparation and control.

Map interface displays geospatial data from OpenStreetMap

Map interface with 3D view for checking topography and building heights

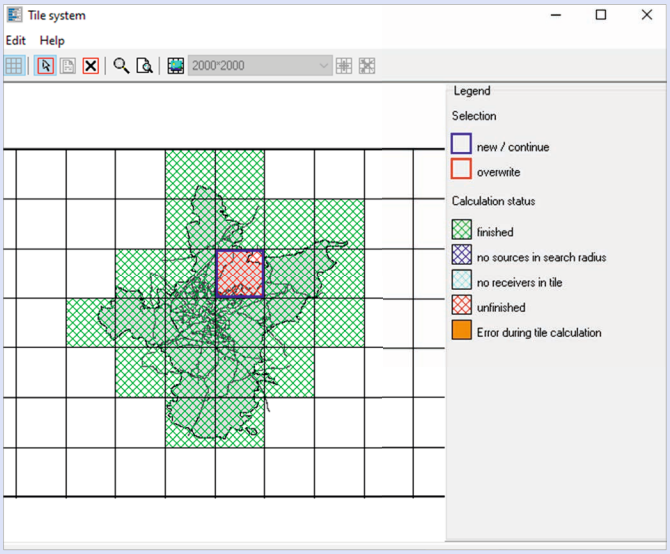


Geospatial data from OpenStreetMap in 2D imported into SoundPLANnoise



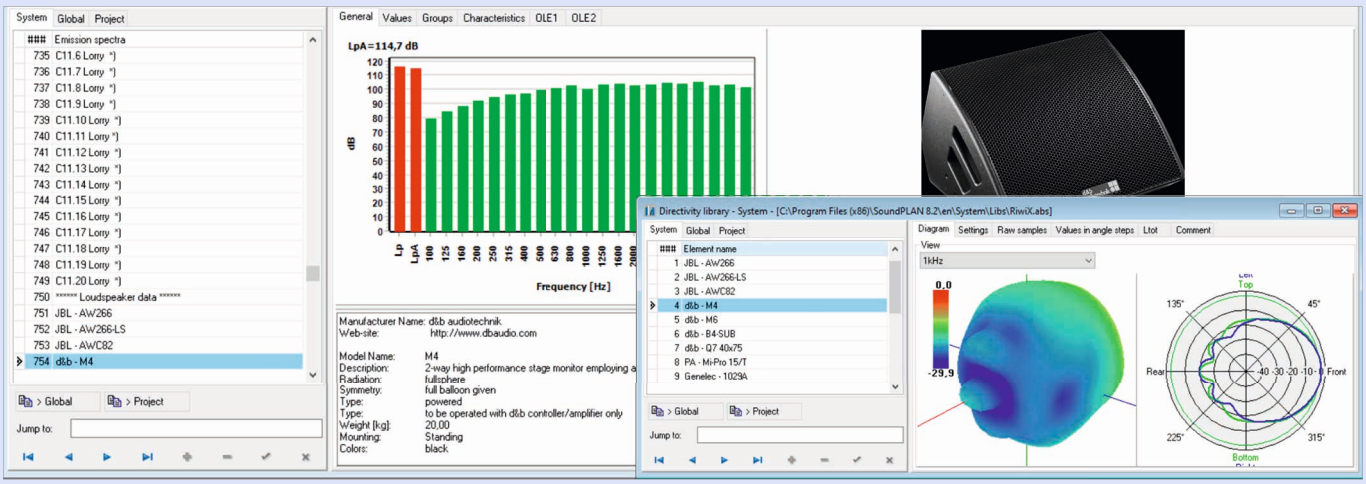
Geospatial data from OpenStreetMap in 3D imported into SoundPLANnoise

In SoundPLAN, elevation data is imported in a special import and is already intelligently filtered in this step, so that no overly fine-meshed digital terrain models are created that unnecessarily increase computing times. 3D city models are often available as CityGML or Shapefiles. With the direct access to OpenStreetMap, you can conveniently import the model data in your project area. Already during the import, the building geometry is provided with the properties contained in the data (for example, building height or road name). The building parts from CityGML are automatically assembled into buildings in this step. Other highlights include tabular control and editing of properties (also formula-based) of all or specifically selected objects, direct editing of object properties even in full 3D mode, and a final geometry check to detect and quickly correct input errors. In SoundPLAN there is no artificial limit to the number of objects, which opens up an infinite number of possibilities in the realization of your projects. There is no need to switch later on from a cheap entry version to an expensive XL version, since SoundPLAN operates from the very first moment without any limitations. If the 32-bit version is no longer sufficient, which only happens in the rarest of cases with SoundPLAN, as we maintain intelligent data management and a sophisticated calculation core, you can always fall back on our 64-bit version free of charge. For the clear data editing, calculating and documenting large projects, usually in the context of noise mapping and noise reduction planning, a tile management system is available, which only loads the data needed in the selected tile to minimize the loading times.



Tile manager for easy data management in large projects or survey areas

Especially for the areas of industrial, sports and leisure noise, the huge system libraries with a total of more than 2,000 entries for source spectra, directivity, absorption coefficients and sound attenuation are an optimal basis for your project work and the creation of a valid data model. If you do not find what you are looking for, you can easily create your own libraries and expand them as you wish.



Spectral emission library. Example shows the definition of a loudspeaker including frequency dependent 3D directivity

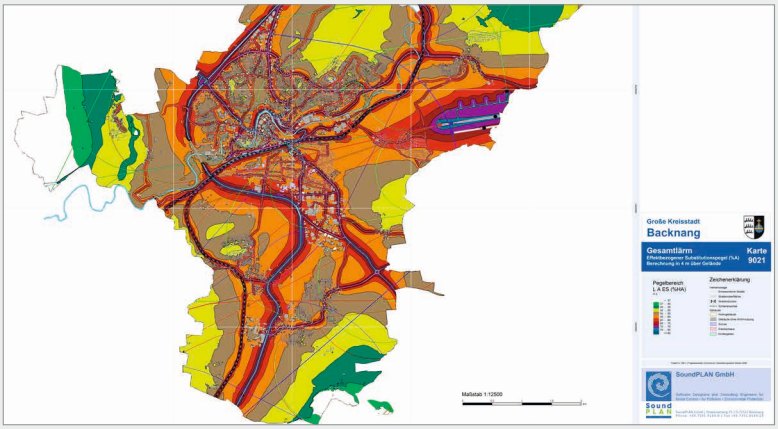
Highlights SoundPLANnoise

Calculation methodology

The SoundPLAN calculation kernel operates at the highest performance and accuracy level with its innovative dynamic decomposition algorithms and is extremely powerful even at higher reflection orders. It can address all threads of your computer, even on computers with more than 64 threads, and thus deliver results even faster - all this free of any additional costs. Of course, you as the user decide whether all available threads are used for the calculation or whether your computer should be available for other tasks in parallel with the calculation. If a calculation takes a little longer because of large amounts of data or if the results are needed more quickly, you can still use our module for distributed computing in your network, which automatically delivers the tasks to the different computers and combines all the results again. You pay for this additional module once and decide for yourself how many computers from your network should be included in a calculation. This means that you do not incur any subsequent costs by purchasing additional licenses for the use of additional calculation cores or threads. Of course, quality assurance (ISO 9001 conformity) and traceability of the produced results play a central role for us. For each calculation carried out in a project, the data and calculation settings used are always documented. This means that the results can be checked and traced even years later. Furthermore, SoundPLAN is extensively tested against thousands of test cases, either our own, or official ones if available (for example according to ISO 17534-1, including part 2 to 4). SoundPLAN offers you more than the usual propagation guidelines. For some time now, we included a quality-assured implementation of one of the most innovative and modern standard. The Nord 2000 is already being used very successfully not only in Scandinavia, but also wherever the usual guidelines fail, such as in the calculation of wind turbines or when individual meteorological situations need to be assessed and the annual mean value does not provide sufficient information.

Result Documentation

SoundPLANnoise provides various levels of detail for documenting and checking the results. Just select the information you need for your project or results presentation from the extensive results database. Thus, in addition to the overall result, you receive the spectra, the source contribution levels and the mean reduction of the noise sources on the propagation path for each receiver, results for individual source groups and tables of the sources considered. Protocol tables are available for investigating special issues.

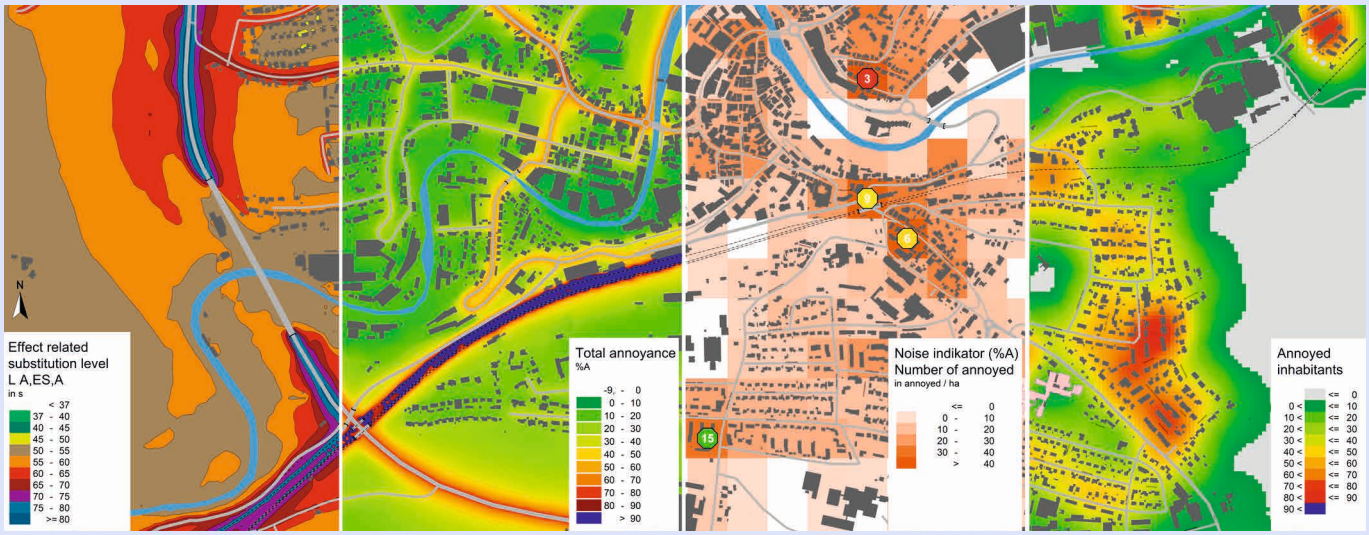


Weighted sum level (road, rail and air traffic) for the city of Backnang, Germany

In addition, SoundPLANnoise includes an integrated spreadsheet optimized for noise surveys, allowing you to compare the results of multiple calculations directly in SoundPLAN. Even complex formulas, e.g. nested IF-THEN relationships or case distinctions, logarithmic addition or subtraction and much more are possible. The formula syntax is based on the Excel keywords.

1	13	12	14	15	18	19	22	23	26	27
Serial. No.	Station	Direction	SA	H l-A	Status Quo		Varian Wall 3.5 m		Variant Wall 5 m	
					Day	Night	Day	Night	Day	Night
	km		m	m	in dB(A)		in dB(A)		in dB(A)	
1	2	3	4	5	6	7	8	9	10	11
Facade length above limit and costs (lump sum of 400 € per m facade length)										
w/o noise protection:	105,2 m	42.085,9 €								
variant wall 3.5 m:	52,6 m	21.043,0 €								
variant wall 5 m:	27,1 m	10.859,6 €								
Oak Street 13				**GR**	Limit Day / Night 59 / 49 dB(A)					
625	0+469	S	46,43	0,32	58	49	58	48	58	48
625	0+469	S	46,43	3,12	59	49	59	49	59	49
625	0+469	S	46,43	5,92	60	50	60	49	59	49
626	0+477	E	42,34	0,02	61	52	60	51	60	51
626	0+477	E	42,34	2,82	63	53	62	53	62	53
626	0+477	E	42,34	5,62	64	55	64	55	63	55
627	0+470	N	37,38	0,30	63	51	55	45	53	44
627	0+470	N	37,38	3,10	64	53	58	48	55	47
627	0+470	N	37,38	5,90	66	55	62	53	59	52
628	0+463	W	41,38	0,55	60	49	53	43	51	42
628	0+463	W	41,38	3,35	61	50	55	46	53	45
628	0+463	W	41,38	6,15	62	52	58	49	55	48
Highest limit exceedance per building:										
w/o noise protection: 6,3 dB(A)		variant wall 3.5 m: 4,2 dB(A)				variant wall 5 m: 3,8 dB(A)				

Spreadsheet with the results of different variant calculations and statistical evaluations of the costs for noise protection measures



Effect related substitution level (total noise level of all traffic sources) in dB(A)

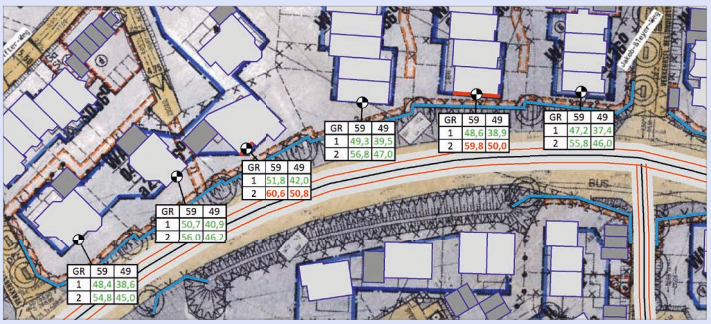
Total annoyance in % for all traffic sources

Number of annoyed inhabitants per hectare including ranking

Hotspot analysis of annoyed inhabitants

The big advantage of this approach is that after a recalculation you can directly see the tables with the new results at the push of a button, and you don't have to do tedious reformatting in external programs. This means that you can dispense with external spreadsheets or expensive CAD or GIS programs and take advantage of the excellent evaluation and further processing of the results directly in SoundPLAN. Since the spreadsheets can be saved as templates, you save a lot of time and get the desired evaluations in a new project without manual rework. Conflicts and sum conflicts, statistical evaluations, variant comparisons, conditional formatting and special population and area statistics in intervals or over threshold values are further important features.

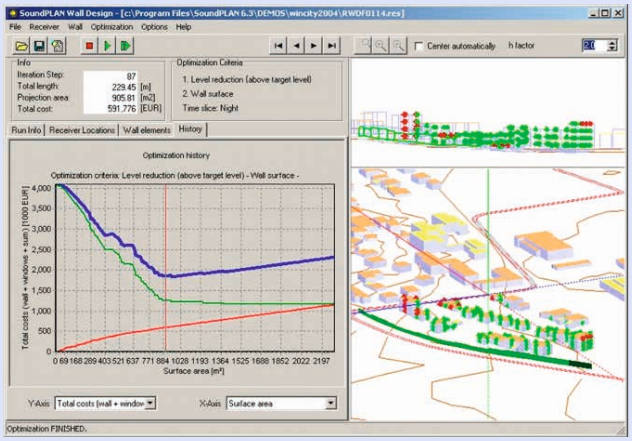
Thematic maps can be easily prepared in accordance with local regulations. The automated output of small level tables, height and reference kilometers of noise protection structures in the graphics avoids manual drawing work through direct access to results and geodata, minimizes the susceptibility to errors and saves a lot of time! An additional highlight for large projects is the automatic generation of plan sections and an overview plan based on plan squares or the users own areas for example city districts.



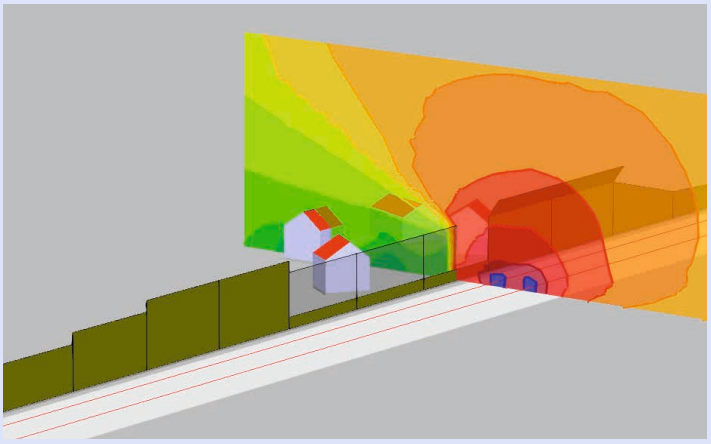
Receiver tables for the facade with the highest level including area usage and limit values

Convenient analysis and optimization tools

The module Wall Design offers an automatic optimization of noise protection structures for compliance with the limit values at individual receiver points or for entire areas via characteristic values such as „facade length above limit value", taking into account the cost/benefit ratio of active to passive noise protection. To each segment of a single wall or berm the height needed to meet the requirements is automatically assigned.



Optimization process to find the best noise protection concept



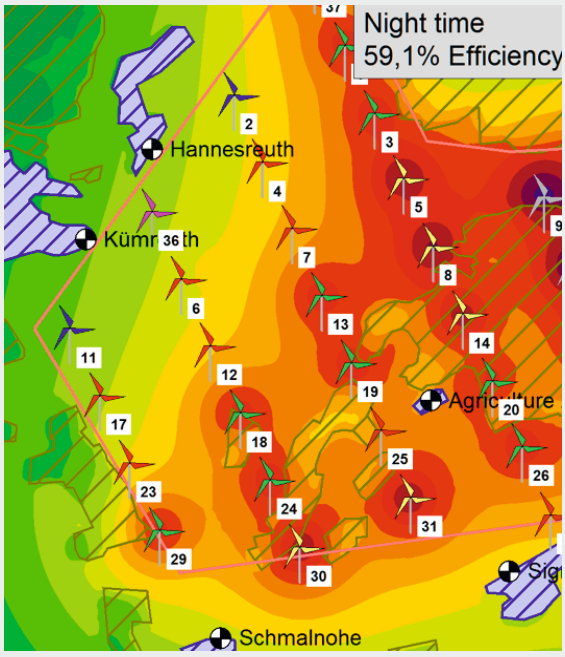
3D visualization of the effectiveness of a noise barrier with a vertical noise map

Highlights SoundPLANnoise

In addition to conventional level assessments, SoundPLANnoise enhances analysis with modern psychoacoustic parameters such as Loudness (ISO 532-1:2017), Sharpness (DIN 45692:2009), and Strongest Tone (ISO 1996-2:2017). These parameters provide a more detailed evaluation of tonal and spectral properties, enabling a more precise assessment of environmental noise.

SoundPLANnoise also includes all the tools you need to efficiently produce the required results in the context of noise quota assessment (module: noise allotment). These can then be directly introduced in the development plan to avoid future conflicts.

With Expert Industry (part of the module Tools Industry) you can find the most efficient noise reduction strategies even for the most complex industrial installations. You define possible mitigation measures for the dominant sources only, including the expected costs, and leave the rest to SoundPLAN. The result will be a mitigation concept that ensures compliance with the limit values at all receiver locations at the lowest possible cost. With the module Building Acoustics - outside you determine and optimize the required properties (sound reduction index) of the exterior components of an occupied space according to ISO 12354-3 including flank transmission and manage the results for groups of buildings or entire study sections. Thus, even extensive projects in the context of noise remediation (design of passive noise protection) can be easily managed without losing the overview.

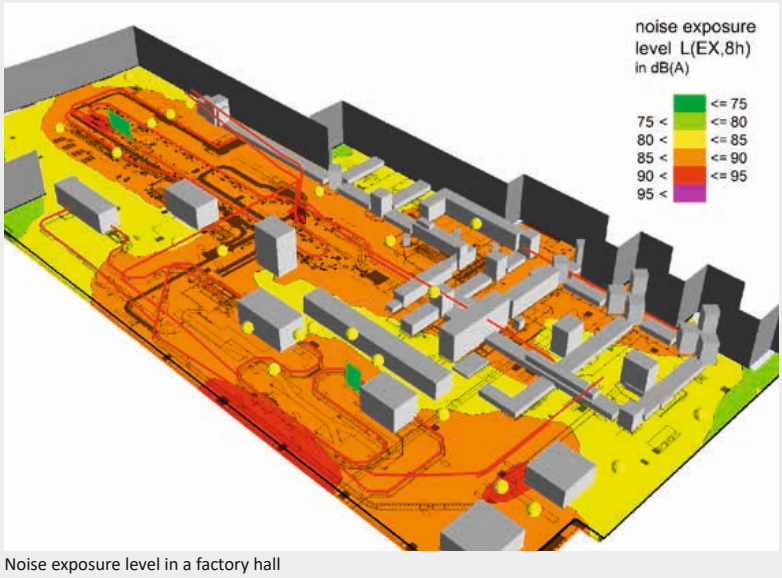


Optimization concept for a wind farm. SoundPLAN selects the most efficient noise reduction measures (turbine operation mode), to keep the noise limits for all relevant receiver points.

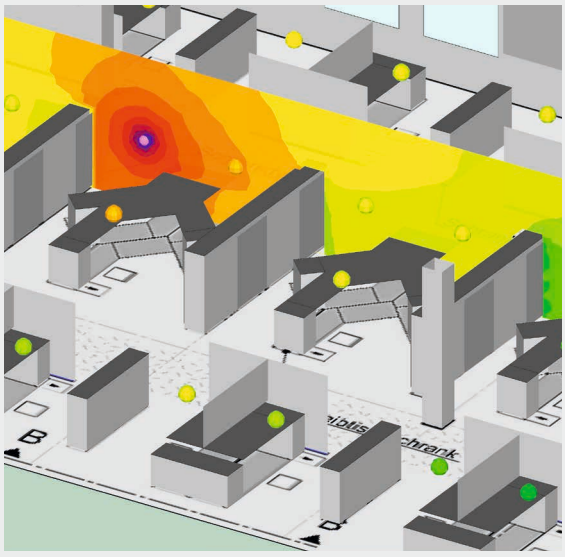
Special topics

SoundPLAN is your perfect solution for very special issues. This is demonstrated, among other things, by the calculation of wind farms. For this purpose there are the specially adapted calculation rules, optimization tools for finding the most efficient utilization concept and the frequency range of 1 - 20,000 Hz, which can be used in third octaves, to also take low-frequency nuisances into account.

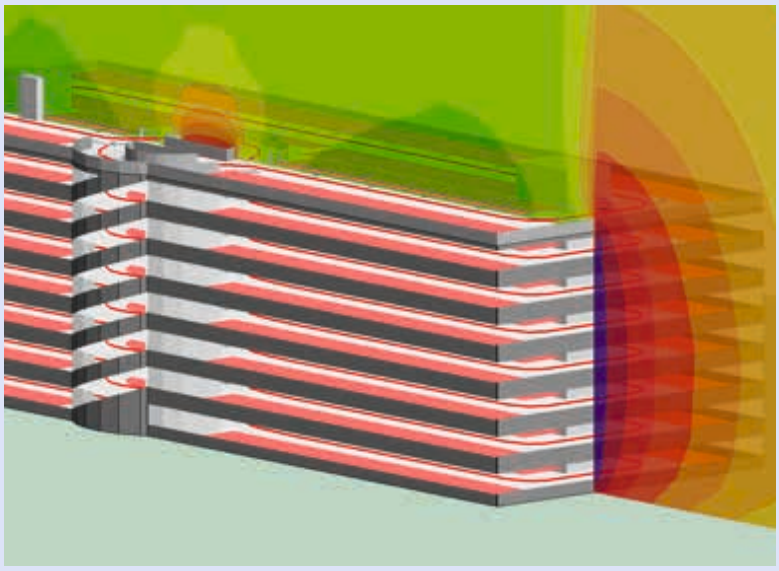
With the additional indoor module, you have the ability to determine sound propagation in enclosed spaces. The unique calculation method (Sound Particle Diffraction - SPD), which is quality assured according to E DIN 38457:2024, can be used to solve all problems in the fields of occupational health and safety or room acoustics.

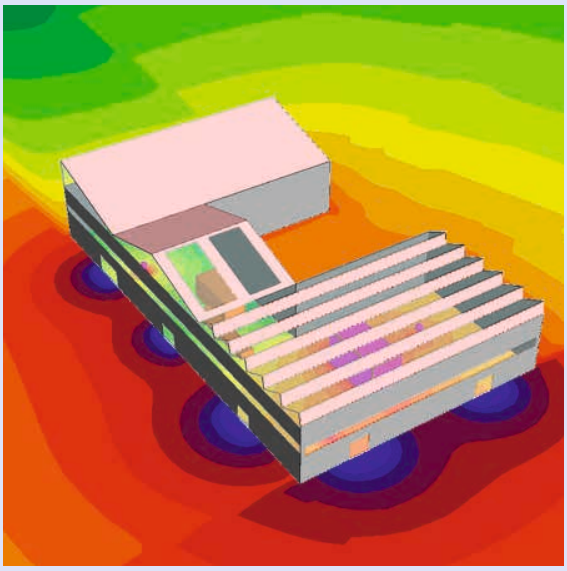


Noise exposure level in a factory hall


Speech level in an open plan office

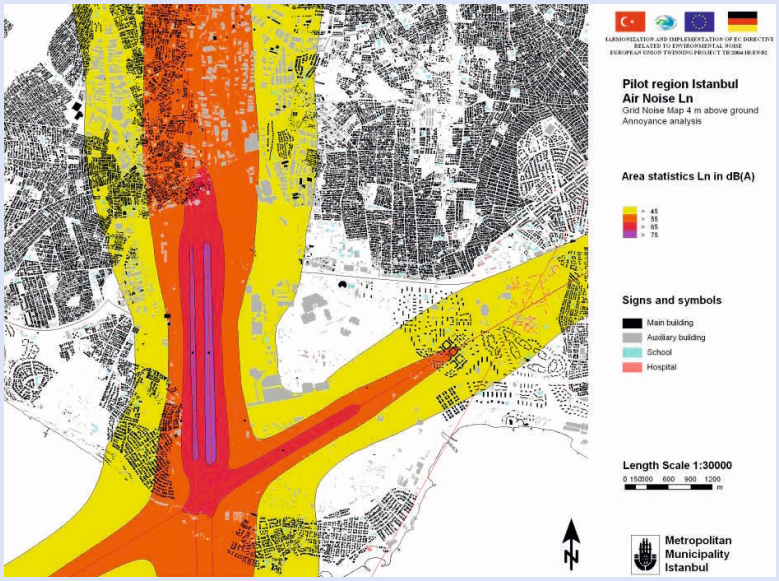
This includes the determination of all acoustical relevant room parameters and the option to auralize the projected room. Thanks to the complete integration of this module in SoundPLANnoise, you can not only carry out a calculation in the interior, but also simulate the radiation of the building into the environment seamlessly. This unique option has been used successfully by our customers for many years and is indispensable in their daily work.





Noise exposure level of a parking garage and a production hall. In both cases, the indoor level was calculated with a pre-calculation for all radiating building envelopes.

In the area of aircraft noise, in addition to all globally relevant calculation methods, we offer the possibility of calculating noise propagation directly on the basis of imported radar data. This innovative and extremely time-saving method has meanwhile been successfully used for noise impact studies and large airports.



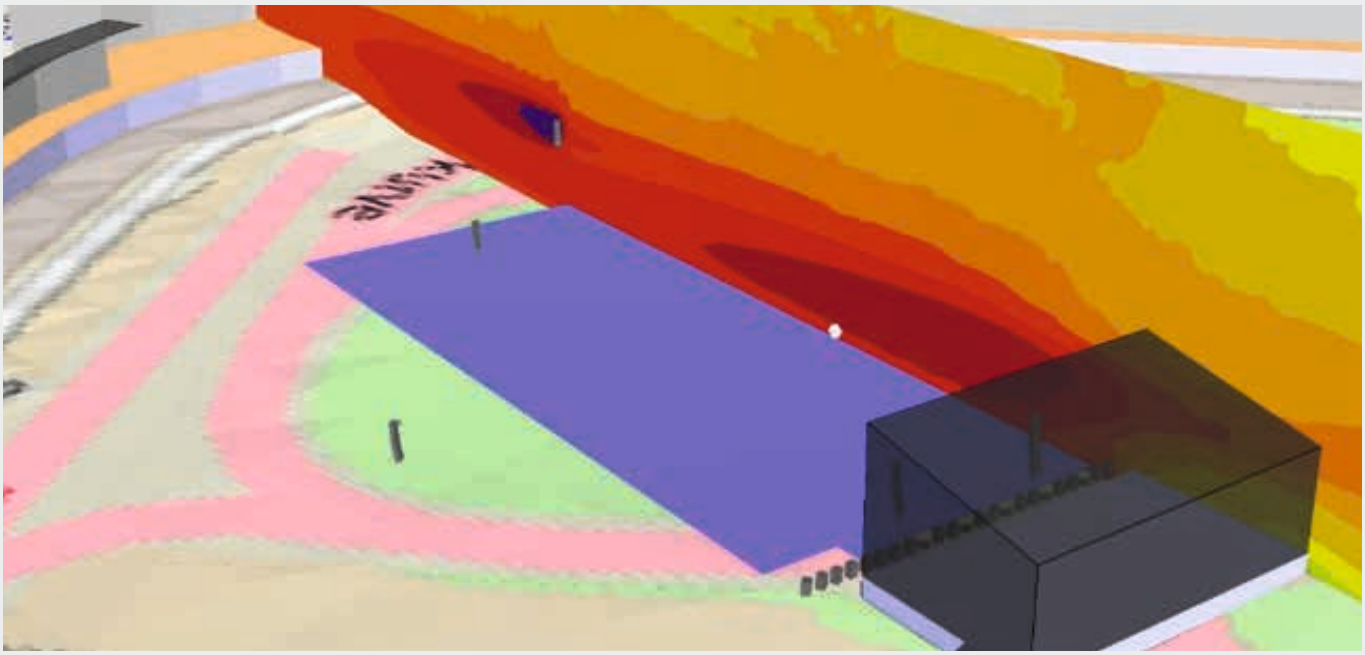
Sound level distribution of a commercial airport

Noise levels of a backwards takeoff of a helicopter from a roof top landing platform

Thus, not only can evaluations for specific days be created in order to assess certain noise complaints, but a calculation and assessment of an entire year according to the environmental noise directive 2002/49/EC and CNOSSOS-EU can also be performed with a minimum of work.

Highlights SoundPLANnoise

Are you faced with the problem of having to assess a large open-air event? SoundPLANnoise is the only program in the field of environmental acoustics that allows you to take the coherence effects of complex loudspeaker setups (line arrays) into account in your calculations import d&b.



Acoustic simulation of an open-air concert with several line arrays

In special situations, it may be necessary to consider sound transmission through shielding walls, which is neglected in most calculation guidelines. Therefore, we have added this option for calculations with ISO 9613-2:2024. This means that semi-transparent objects (e.g. tarpaulins) can now be considered.

The figure on the left shows the shielding due to a wall calculated according to ISO 9613-2:2024 with an infinite transmission loss. The middle image shows the results with an assumed transmission loss of 10 dB, and the right image shows the difference between the two calculations (scaled in 1 dB steps).

Many more good reasons to choose SoundPLANnoise

With SoundPLAN you are always on the right track, as there is hardly any task that you cannot master and our competent team is always there to support you. With our international sales network in over 50 countries, you can count on our support anywhere in the world at your working hours (in your time zone). SoundPLAN offers you all this at an unbeatable price, including one year of free program updates and competent hotline support.

Software Designers and Consulting Engineers

Experts for Noise Control and Room Acoustics

SOUNDPLAN GMBH
Etzwiesenberg 15
71522 Backnang
Germany

phone +49.7191.9144-0
mail@soundplan.de
www.soundplan.eu