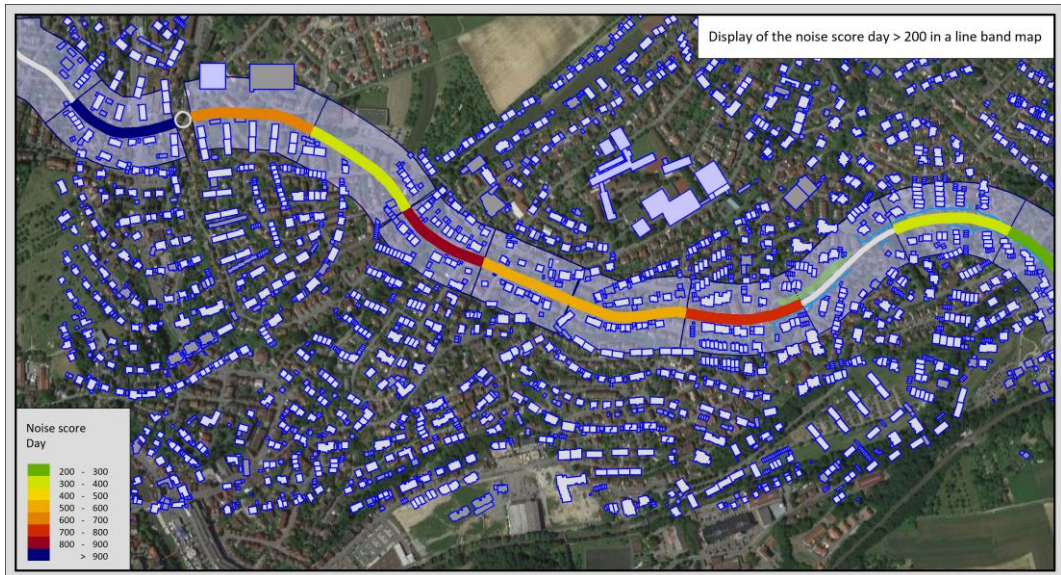


# Update letter 9.1



SoundPLAN GmbH  
September 2024

# New in SoundPLAN<sub>noise</sub> 9.1

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## Innovations 9.1 at a glance

SoundPLAN<sub>noise</sub> 9.1 is an update that contains fewer content-related changes than structural changes. These changes are necessary in order to be able to react more flexibly and quickly to future requirements, for example due to new standards.

- **General**

- The **3D graphics** has been revised and is now based on the latest OpenGL 4.x standard, which has for example improved movement speed.
- The connection to **high-resolution monitors** has been improved, which also made changes to the dialogs mainly in the Geo-Database necessary.
- It is now possible to use bitmaps stored as JPEG2000 (\*.jp2) in SoundPLAN.
- SoundPLAN<sub>noise</sub> 9.1 is only delivered as 64 Bit version.

- **Geo-Database**

- A negative filter has been added to the **text filter** in the **Situation Manager** (text is included / not included).
- **Select buildings via a Spreadsheet** has been extended so that buildings located within areas of an area table and a line band table can now also be selected. You can either select all buildings within the areas or bands or restrict the selection to buildings within certain areas / bands using a Boolean column.
- **Formulas in text columns in the Property Explorer** are checked on “case sensitive” if there is an exclamation mark after the relational operator (=, <, >). This means, for example, that different buildings are recognized even if a text only differs in the spelling.

### **Import / Export**

- In the Geo-Database, the **import** has been revised and additional import formats have been added. The properties displayed in the assignment table for an object can either be taken from the import file, assigned to the objects using the default values or a value specified in the assignment table. This eliminates the need to display the properties dialog of the first object before the import; instead, you can check the assignments via **PREVIEW IMPORT**. When importing roads, incompatible properties are grayed out and cannot be assigned. This makes the import more transparent. In addition, properties can be assigned via **formulas**, for example, if SoundPLAN expects a property as an integer, but these are contained in the import file as characters.

- **New import formats:** Excel, Geopackage, LZW compressed GeoTiffs (e.g. Tiffs with elevation points)
- The **import of traffic data for Schall-03: 2012** has been simplified and adapted to the current DB Excel templates. The trains are created as a library element and transferred directly to the emission dialog together with the number of trains, see "[Import of traffic data for Schall-03: 2012](#)", page 7.
- A list with unique (readable) names for the column headers is provided for the **shape export** and for the **field names** in the Property Explorer. The names do not contain any special characters and have a maximum of 10 characters.

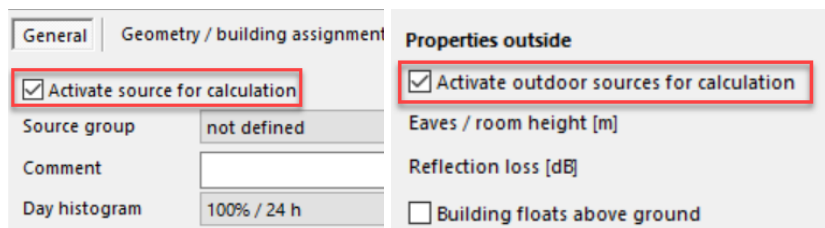
## Objects

- As part of the publication of **ISO 9613-2: 2024**, the "**cylinder**" object was introduced in the Geo-Database. The cylinder is a point object, defined by a diameter and a height. In accordance with ISO, the reflection is calculated using the correction value  $A_{curv}$  (Formula 30). Reflection orders  $> 1$  are not taken into account for cylinders.

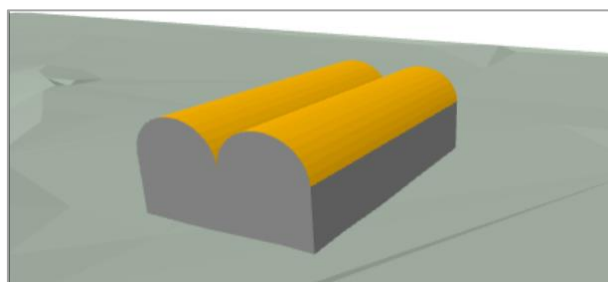
In addition, the detailed consideration for forest according to ISO 9613-2: 2024 was added to the object type **volume type attenuation** and the standard details in the calculation core.

The **stack directivity** described in ISO 9613-2: 2024 can be generated and assigned to a spectrum via a button in the directivity library. As this directivity already includes the diffraction of the building/cylinder below the source, you can deactivate the diffraction accordingly in the *Directivity* tab in the **source properties** dialog.

- **Noise sources** and **industrial buildings:** individual point, line and area sources or the outdoor sources of an industrial building can be deactivated for the calculation.

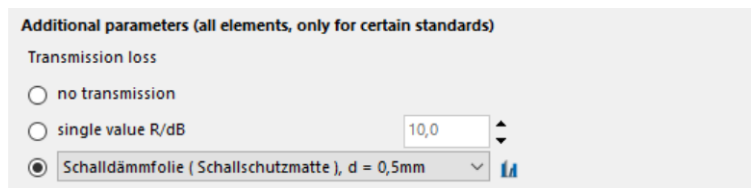


- **Industrial buildings:** In the roof editor, a barrel roof is offered in addition to the shed and saddle roof. The **NUMBER OF RIDGE LINES** determines into how many barrel arcs the roof area is divided. The **NUMBER OF BARREL SEGMENTS** defines how many roof areas a barrel arc is divided into.



- The **photo point** object has been revised, see "[Revision of photo point](#)", page 7.
- For **noise barriers**, the **sound transmission** can be specified for ISO 9613-2: 2024 and the Japanese standards (semi-transparent walls). The sound transmission can

be defined either via a single value R or via a spectrum from the transmission library.



- The roads are now sorted alpha-numerically in the emission documentation (ribbon Miscellaneous | Road).
- When double-clicking on an error message in the **logbook of the industrial building**, the cursor jumps to the corresponding object in the tree.
- **sonROAD18: 2023 (Switzerland):** New input type "Road day histogram + ADT + fraction heavy traffic per time slice". Similar to the sonROAD18 web tool, you can distribute the traffic volumes based on the number of vehicles per hour (veh/h) and the fraction of noisy vehicles (pSV) per time slice.

### Tools

- **Reset road/railway properties:** The tools "Reset road emission" and "Reset railway emission" have been extended to all variant properties so that, for example, the "bridge" property can now also be deleted from the objects.
- **Convert road emission:** The emission can be converted from one standard to a different standard, e.g. from RTN96 to Nord2000.

### • Libraries

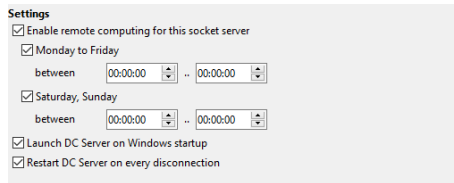
- In the emission, absorption, transmission and attenuation libraries, **filtering for the type of spectrum**, i.e. third octave, octave or single value, has been added.
- The fields "created on" and "last changed" are saved for each library element.
- The psychoacoustic weighting descriptors **loudness, sharpness and strongest tone** were implemented as part of a research project. An element for the psychoacoustic descriptors has been added to the system assessment library.

### • Nord2000

- Nord2000 Road, general
  - enhanced parameter settings for dLRoad in Nord 2000 road surface library.
- Nord2000 Road, Lmax,nth or Lmax,n%:
  - More accurate probit function to calculate Lmax,n% from Lmax,mean
  - Updated Lmax standard deviations (together with Swedish vehicle library)
  - Updated Lmax tab (mean per hour for 6-22h) to fulfill Swedish regulations.
- Nord2000 railway
  - Switch in standard details to automatically set emission line to nearest rail (track)
- Nord2000 Norway implemented

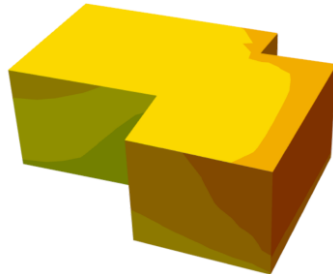
### • Calculation core

- A PC can now be switched on for **distributed computing** at different times on weekdays and weekends.



If both checkboxes are set and no times are specified, DC control is always active.

- In the Facade Noise Map, you can calculate a **receiver grid for the facades and the roof**, which is independent of the floor height. The receiver grid can be displayed in the 3D Graphics as contour areas. The display is controlled in the "Facade noise map" object type.



- The calculation of **floating screens and bridges** has been significantly accelerated.
- The sound particle model with diffraction (SPD) fulfils the requirements of **E DIN 38457:2024-06** (Software for the calculation for workspaces - Quality assurance of software-implemented methods).

- **Spreadsheet**

- In the title rows of the tables, the entries can now be connected not only horizontally but also vertically.

1	18	9	19	13	11	12	14	15	16	17
ser. No.	Station km	Direction	Floor	Usage	Limit		Prognosis w/o NP			
					SA	H I-A	Day	Night	Day	Night
					m		in dB(A)		in dB(A)	
1	2	3	4	5	6	7	8	9	10	11



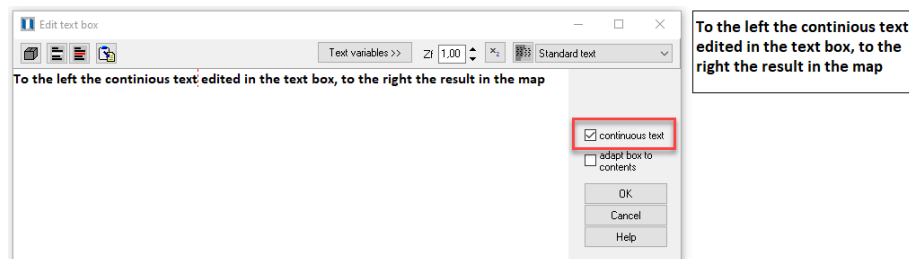
Highlight the cells you want to connect and click on the "Connect cells" icon. The position of the text in the column does not matter, the text is centered vertically across all rows. If there are several texts in this column, the texts are centered vertically next to each other. If columns are already connected horizontally, they cannot also be connected vertically.

- In addition to the number of affected inhabitants and dwellings, you can also calculate the number of affected buildings in the level intervals/above threshold values in inhabitants and area statistics.
- In the area statistics, inhabitants can no longer be assigned only to the loudest level, but also to the median or evenly distributed level.
- The calculation of statistics has been significantly accelerated.
- **Text filter** - In text columns, you can either filter on the entire text content (for example, the receiver name "Oak street 4") or on a part of the text (for example, "Oak street"). Only the rows corresponding to the filter setting are displayed in the table, see "[Text filter Spreadsheet](#)", page 8.

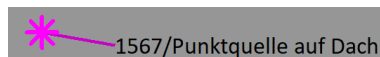
- **Calculate and highlight** has been extended by a filter symbol, which can be used to hide rows that are not selected directly here and not in an additional step. The table statistics refers to the displayed rows; structure rows are not displayed. The hidden rows are displayed again via **TABLE | SHOW HIDDEN ROWS**.
- **Area filter** - When loading or rebuilding a receiver or building table, you can specify in the settings that results are only loaded within a certain area. The area objects must be map sections or area usages. Select an area object contained in the Geo-File.
- [Tools NMP] You can use the **line band table** to calculate the noise score of roads and railways. The result can be displayed graphically in a **line band map** using a color scale. The calculation of the noise score is based on the inhabitant statistics, whereby no intervals are created here. See "[Line band table and line band map](#)", page 8.

- **Graphics**









- For **text boxes** (not for color scale or legend) you can now select "**continuous text**", the line breaks are then automatically selected based on the box width and font. This also works for text variables. Hyphenation is not possible.



- "**Show properties as text**": For point objects, you can switch on a **reference line** to the point object in the object types, tab *Cartography*.



- In the **color scale**, you can display the area shares in the individual intervals in % or km<sup>2</sup>, ha or m<sup>2</sup>. Select what you want to display in the scale layout (Edit content of the color scale).

Area portions in the individual noise level intervals			
Noise levels day in dB(A)			
		ha	%
	<= 50	2,78	5,8
	50 - 55	17,74	36,9
	55 - 60	11,78	24,5
	60 - 65	6,55	13,6
	65 - 70	4,98	10,4
	70 - 75	2,99	6,2
	75 - 80	1,06	2,2
	> 80	0,19	0,4

- Grid noise maps that are available as GeoTiffs can be selected as file type "General grid map" for the **grid operations**.
- **Grid noise maps** can be exported as **GeoTiff** [Cartography module].
- To improve the output speed, for grid noise maps the grids are drawn instead of the contour lines if several grids coincide on one pixel during output.
- Pressing the **Shift key + mouse wheel** activates a **temporary zoom mode**.

## Import of traffic data for Schall-03: 2012

Open the Excel file directly in the properties dialog, tab *Emission "Schall 03-2012"* via the button **TRAFFIC DATA DB**.

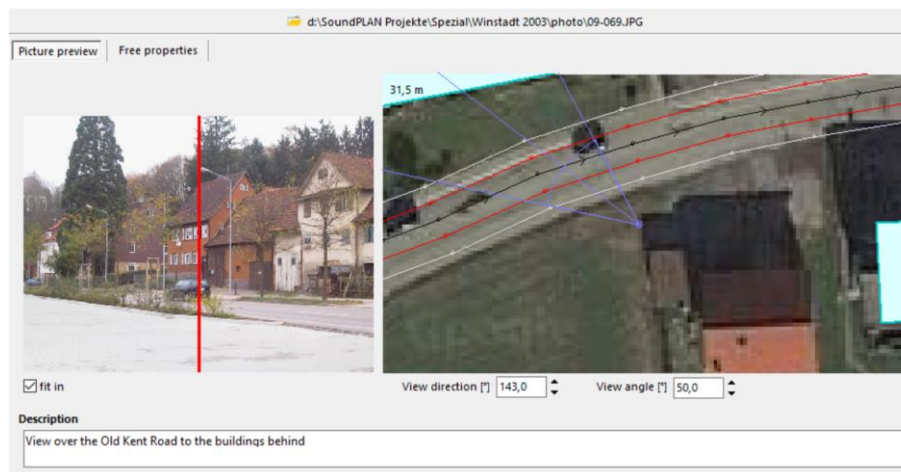
The train name is composed of train type, UBA (German Federal Environment Agency) vehicle category and number of units. You can also enter a prefix and/or suffix (e.g. date of the forecast or track number).

The number of trains can be available in the table for both directions together or for each direction separately. This is specified via the track direction indicator RiKz. If the number of trains is the number for both directions (RiKz 1+2), the default setting is that half of the trains are set as the number N for the current track.

Information on the imported file (file name, track number, section, horizon) is entered in the *Notes* tab. The information "track speed" and "specially monitored track" are also documented together with the kilometer index. Please enter these characteristics manually in the corresponding fields of the property dialog.

## Revision of photo point

The photo and the site map view are now shown together. This makes it easier to adjust the view direction and angle of the photo to the actual image viewport.



The direction and aperture angle are displayed as rays for the photo point you are currently editing.

In the photo itself, the center axis is shown as a red line.

Procedure: Find a point on the center axis (for example, a corner of a building) that you can find in the site map. Select this point of view in the site map with **Ctrl+ left mouse button**. For the aperture angle, click on an edge point of the photo in the site map with **Ctrl+ right mouse button**. The viewpoint and edge point are fixed. If you now need to adjust the location, the direction and angle will not change.

*Hint: the view and end point will only be stored until you close the dialog or switch to the next photo point. The view points should be selected before you adjust the location.*

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## Text filter Spreadsheet

In text columns, you can either filter on the entire text content (for example, the receiver name "Oak street 4") or on a part of the text (for example, "Oak street"). Only the rows corresponding to the filter setting are displayed in the table.

Activate the filter function with **OPTIONS | SHOW TEXT FILTER (Ctrl+F)**. Two additional selection lists are displayed.



Select the filter column and the content of the column to be filtered. If you activate the checkmark between the selection lists, you can enter a text instead of selecting a text.

The text filter can also be used for complex structured tables. If evaluations are calculated for the entire table in statistics rows, the filter affects the values shown in the statistics.

Without filter:

<b>Number of investigated buildings: 491</b>
Status Quo: Number of buildings with limit exceedance D/ N: 143 / 221
With noise protection: Number of buildings with limit exceedance D / N: 34 / 89

With filter:

<b>Number of investigated buildings: 18</b>
Status Quo: Number of buildings with limit exceedance D/ N: 9 / 14
With noise protection: Number of buildings with limit exceedance D / N: 0 / 2

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## Line band table and line band map

[Tools NMP] The line band table calculates the noise score for road or railway projects from the result of a facade noise map. The parameters used for the line band can be freely defined. The result of the noise score calculation can be visualized graphically in the Graphics as data type line band map using a color scale. Besides the noise score, however, other evaluations can be displayed in a table or in the graphics.

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### Noise score

The noise score is a method used to determine the personal noise exposure within a specific area or section of a line source. It was proposed by Bönninghausen and Popp in 1988 and was originally developed for comparing variants in urban and traffic planning.

The following variables are included in the calculation:

- Level (assessment level)  $L_i$  for the number of persons affected  $n_i$
- the level of the area-specific threshold value  $L_s$
- the total number of affected persons  $N$  within a section



The noise score is calculated as follows:

$$LKZ = \sum_{i=1}^N n_i(L_i - L_S)$$

In SoundPLANnoise, the assessment level and threshold value are based on a Façade Noise Map calculation and the assessment used there.

The noise score is calculated within line bands or within areas and can be standardized to a certain section length / area in order to compensate for different sizes in investigation networks. In addition, sections longer than a defined length can be subdivided within a line band for better comparability.

To calculate the noise score within a line band around roads and railways, the inhabitant statistics is used in the table type **line band table**. For the calculation in areas or building blocks, the basis is an **area table**.

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## Line band table

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In the **Spreadsheet**, select the table type **line band table** and click on **NEW**. Select a Situation or a Geo-File with roads or railways as the basis of the line band table.

Define the **BAND WIDTH** that specifies the distance from the source at which the results at the buildings are to be taken into account. With a band width of 100 m, the buildings 50 m to the right and left of the source are considered.

Sources that are longer than the specified **MAXIMUM SEGMENT LENGTH** are divided into smaller segments of the same length. For example, a source with a length of 600 m with a maximum segment length of 500 m is subdivided into two segments, each 300 m long. Subdivided sources are identified by a segment number. The shorter the individual segments are, the more clearly the hotspots can be identified.

Specify whether and to what length in [m] you want to **NORMALIZE** the road / railway sections to compensate for different section lengths. Normally, the sections are normalized to 100 m.

The table is created with the green tick.

Name	Source name	Segment number	Station [km]	Length [m]
Old Kent Road - 1	Old Kent Road	1	0+000	177,43
Old Kent Road - 2	Old Kent Road	2	0+177	177,43
Kingsland Road - 1	Kingsland Road	1	0+000	169,86
Kingsland Road - 2	Kingsland Road	2	0+170	169,86
Kingsland Road - 3	Kingsland Road	3	0+340	169,86

Roads and railways are listed by name and, in the case of subdivided sources, by segment number. Roads are also listed as individual lines if the section name changes.

Roads / railways with a length of less than half the bandwidth are not listed in the table unless the row was created by a change in the section name.

In the next step, call **FILE | ADD ADDITIONAL COLUMNS | ADD INHABITANT STATISTICS**.

Settings / Filter

**Options**

Calculate with displayed float values

**Statistics**

no intervals     intervals     threshold values

**Calculation method to assign inhabitants and dwellings**

assign all inhabitants and dwellings to the loudest value

assign inhabitants and dwellings

according to the level of the facade section (CNOSSOS-EU)

according to the level above median (CNOSSOS-EU)

according to the number of receivers (old German VBEB)

assign all to the loudest value if there is only one dwelling per floor

**Settings for EU-2020/367**

Threshold IHD / HA:     Threshold HSD:

Incidence rate of ischaemic heart disease (IHD):

use only middle interval value (German 34, BImSchV)

✓ ✗ ?

Select **NO INTERVALS** for the calculation of the noise score. As a rule, the inhabitants are assigned to the loudest value. For other evaluations, you can also assign the inhabitants according to the criteria of the EU inhabitant statistics. In the following dialog, you define which time slices, source groups and single-number columns should be calculated.

Select result columns

**Source groups**

Sum level

**Time slices**

LrD (Noise level Day)

LrN (Noise level Night)

LrDN (Noise level Day/Night)

**Single value columns**

Noise score

Number of inhabitants

**EU - 2020/367**

IHD    LrD

HA    LrD

HSD    LrN

Road noise

Railway noise

Aircraft noise

You can also calculate IHD, HA and HSD in accordance with EU 2020/367 for the individual sections. Click on the green tick to start the calculation.

1	2	3	4	5	6	7
Name	Source name	Segment number	Station	Length	EU inhabitant statistics	
						Noise score
			[km]	[m]	LrD	LrN
Old Kent Road - 1	Old Kent Road	1	0+000	177,43	206	160
Old Kent Road - 2	Old Kent Road	2	0+177	177,43	27	21
Kingsland Road - 1	Kingsland Road	1	0+000	169,86	0	0
Kingsland Road - 2	Kingsland Road	2	0+170	169,86	319	512
Kingsland Road - 3	Kingsland Road	3	0+340	169,86	1246	2274

If the noise score is normalized, it is converted to the selected length. Very short sections due to a change in the section name with many people exposed to noise can lead to very high, implausible noise score values. You can remove these rows from the table using the "Delete row" icon or **Ctrl+Del**.

Further functions in the line band table:

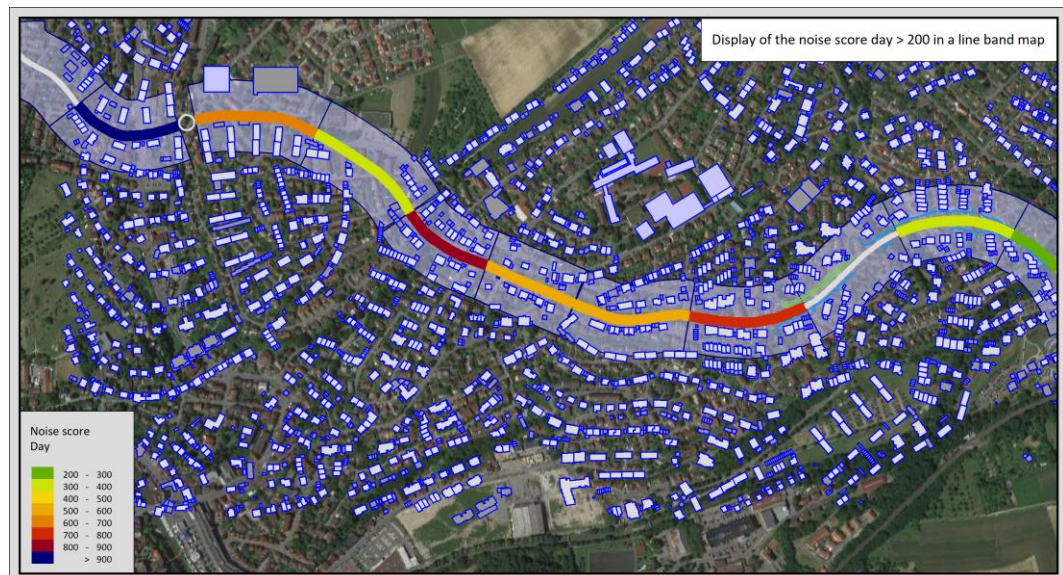
- Via FILE | ADD ADDITIONAL RESULT COLUMNS, results of a grid noise map, meshed noise map or a hotspot calculation within the line band can be added to new columns.
- Add a column of a receiver table
- Calculate using formulas, for example the sum of the noise score day and night
- Design table using structure and statistics lines and make additional statistical statements.

Example of a formatted line band table with summed noise score per time slice in a statistics row:

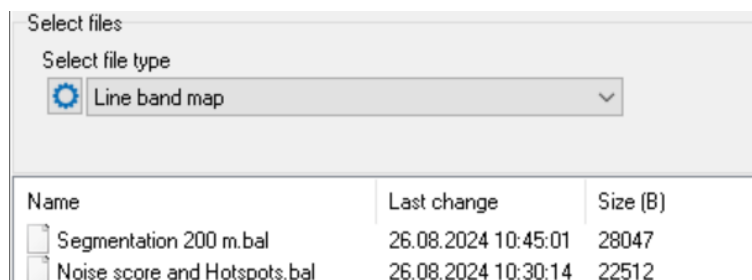
Name	Source name	Segment-number	Station [km]	Length [m]	IHD LrD	HA LrD	HSD LrN	Evaluation		No. inhabitants	Hotspot
								Noise score LrD	Noise score LrN		
Sum noise score day: 5671											
Sum noise score night: 7486											
Oak street - 72931482 - 1	Oak street	1	0+000	166,49	0,03	13	4	570	762	133	0,4
Oak street - 72931482 - 2	Oak street	2	0+166	166,49	0,04	17	6	770	1000	168	0,5
Oak street - 72931482 - 3	Oak street	3	0+333	166,49	0,01	5	1	121	252	105	0,2
Oak street - 72931482 - 4	Oak street	4	0+499	166,49	0,02	9	3	350	510	107	0,4
Oak street - 72931482 - 5	Oak street	5	0+666	166,49	0,01	5	2	231	307	60	0,2
Lime tree road - 72931054 - 1	Lime tree road	1	0+000	133,72	0,04	18	6	844	1086	124	0,5
Lime tree road - 72931054 - 2	Lime tree road	2	0+134	133,72	0,03	12	4	531	699	90	0,3
Pine road - 538830425 - 1	Pine road	1	0+000	174,78	0,03	16	6	692	926	148	0,7
Pine road - 538830425 - 2	Pine road	2	0+175	174,78	0,02	7	3	346	441	79	0,3
Pine road - 72930896 - 1	Pine road	1	0+000	158,45	0,00	2	1	91	115	13	0,2
Pine road - 72930896 - 2	Pine road	2	0+158	158,45	0,05	23	8	1125	1388	149	0,8

## Line band map

All columns stored in the line band table can be displayed graphically in a line band map.

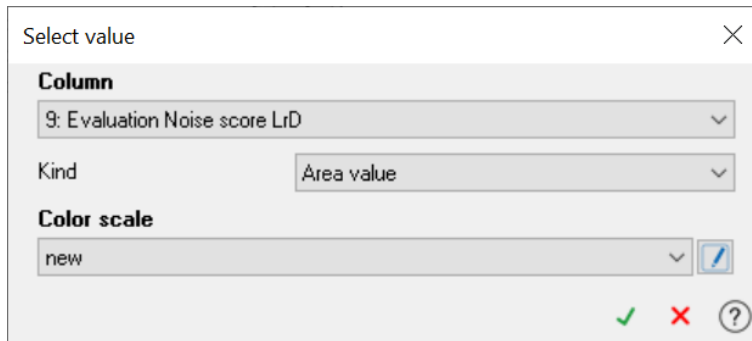


In the file selection, select the data type line band map and line band table it is based on.

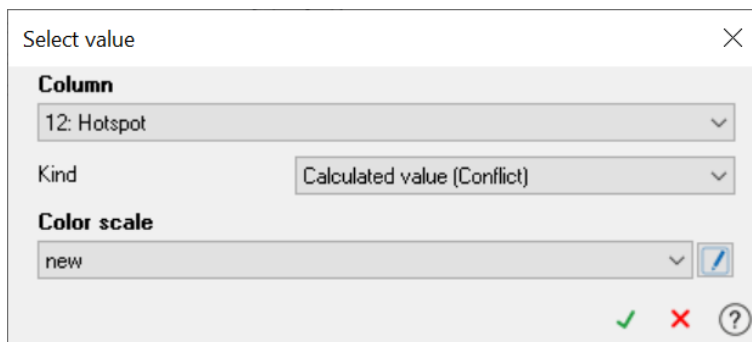


### Result query line band map

In the results query, select the column you want to display and the color scale. For single-number values, such as the noise score, the value is assigned to the line band or area.



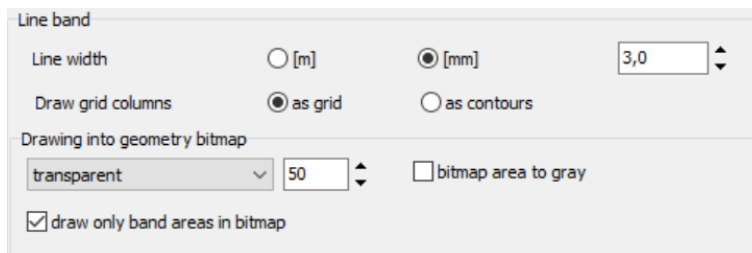
If the selected column contains a grid result, for example a hotspot calculation, it is not the area value that is evaluated, but the calculated value.



The green tick loads the data and displays it as a line.

### Object type line band map

In the map object types, you select the line width of the displayed line.



For grid columns, for example the result of a hotspot calculation, you can select whether you want to display the calculated grids or the contour lines.

In the sub-object type band area, you define whether and how you want to display the band areas.

If you display the band areas and have loaded a background bitmap, you can draw the band areas in the bitmap as with grid noise maps.