



Matrix Editor in VISUM 11.5

Using filters and dynamic aggregation in the VISUM 11.5 Matrix Editor

One of the major usability improvements introduced with VISUM 11.5 is the new Matrix Editor. In this article we would like to highlight some maybe less visible features of the new matrix editor which are helpful in order to focus analysis on the most important aspects of the matrices. This is achieved by restricting the cells displayed according to filter conditions, by dynamically aggregating the contents of the matrices and by applying cell formats based on the matrix contents.

Filtering of the displayed cells is activated through the 'Filter' button  on the matrix editor toolbar. Filtering can work in conjunction with zone and OD pair filters and based on cell values and any combination of these. The 'View options dialog' - accessible through the menu or the toolbar button  - allows filtering to be controlled. While a filter based on active zones will result in both rows and columns for these zones being displayed, an OD pair filter defined by ranges of *FromZoneNos* and *ToZoneNos* results in rows and columns being displayed for different zones thereby facilitates directional analysis (see screenshots below). Especially in conjunction with the side-by-side view of multiple matrices this allows a more compact display than the respective lists. The filtered matrices are editable in the same way as in the full display, e.g. using the multi-cell editing feature or copy & paste – all with full UNDO/REDO support.



The screenshot shows the 'Matrixeditor (2 Matrizen)' window. The toolbar includes icons for matrix operations: addition (+), subtraction (-), multiplication (*), division (/), min/max, and mathematical functions like x^a , e^x , $\ln x$, $1/x$, and transpose ($()^T$). The matrix below is a 4x4 grid with columns labeled 100, 100, 110, 110, 130, 130, 140, 140. The first two columns are summed, and the last two columns are summed. The matrix values are as follows:

	100	100	110	110	130	130	140	140		
	Summe Nr. 5	Summe Nr. 7	Nr. 5	Nr. 7	Nr. 5	Nr. 7	Nr. 5	Nr. 7		
100	1,15	6,67	0,04	2,26	0,03	0,89	1,03	2,43	0,06	1,09
110	0,52	12,05	0,08	2,58	0,05	2,75	0,26	4,85	0,13	1,86
130	2,27	35,09	1,43	3,62	0,11	2,49	0,45	24,75	0,29	4,23
140	0,63	16,40	0,10	1,74	0,08	0,95	0,32	6,32	0,13	7,39

Figure 1 Side-by-side display of two matrices filtered by a zone filter on *ZoneNo*

Matrix Editor in VISUM 11.5

6 x 6			200	200	210	210	220	220	230	230	240	240	250	250
		Matrix	No. 5	No. 7	No. 5	No. 7	No. 5	No. 7	No. 5	No. 7	No. 5	No. 7	No. 5	No. 7
	Sum 'No. 5'	Sum 'No. 7'	8,37	19,12	4,92	11,09	0,82	1,79	24,19	56,20	37,42	32,08	114,08	35,79
100	17,02	10,98	0,68	1,14	0,31	0,77	0,11	0,16	2,35	5,26	4,99	1,91	8,60	1,75
110	30,93	22,00	1,38	2,41	0,70	1,48	0,24	0,28	5,41	9,50	4,98	3,73	18,22	4,59
120	18,59	11,55	0,88	1,55	0,44	0,77	0,14	0,11	2,95	3,93	2,88	2,23	11,30	2,98
130	57,53	50,81	3,16	6,08	1,55	4,26	0,06	0,63	1,45	19,35	11,80	10,20	39,51	10,29
140	43,06	29,25	2,10	3,42	1,05	2,55	0,04	0,40	6,95	11,14	7,42	5,92	25,50	5,82
150	22,66	31,48	0,17	4,53	0,87	1,26	0,25	0,21	5,08	7,03	5,35	8,09	10,94	10,36

Figure 2: Side-by-side display of two matrices filtered by an OD pair filter on *FromZoneNo* and *ToZoneNo*

While in a filtered display the values correspond to the matrix values, the matrix editor also provides an aggregated perspective on the matrices. This perspective allows the matrix values to be aggregated based on any zone attributes – either the same attribute or even a different one for rows and columns and by using different aggregation functions such as sum, min/max, average and weighted average using OD pair attributes or values from another matrix as a weighing factor. Aggregation is also controlled in the ‘View options dialog’ and works in conjunction with side-by-side display and the filters described above, making it easy to define complex queries (see screenshot below).

10 x 3			1	1	2	2	5	5
		Matrix	No. 5	No. 7	No. 5	No. 7	No. 5	No. 7
	Sum 'No. 5'	Sum 'No. 7'	1455,04	2128,34	12730,20	6806,57	0,00	0,00
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
1000	1784,44	1195,26	124,76	338,44	1659,67	856,83	0,00	0,00
2000	308,68	181,39	34,90	43,55	273,78	137,83	0,00	0,00
3000	653,15	344,98	98,80	65,24	554,35	279,74	0,00	0,00
4000	120,14	124,93	11,26	26,96	108,88	97,97	0,00	0,00
5000	2435,34	1290,53	320,37	221,35	2114,98	1069,18	0,00	0,00
6000	2371,86	1807,90	195,62	427,80	2176,23	1380,10	0,00	0,00
7000	4225,42	2413,07	448,87	518,17	3776,55	1894,90	0,00	0,00
8000	1225,26	238,55	186,23	70,78	1039,02	167,77	0,00	0,00
9000	1060,95	1338,29	34,22	416,04	1026,73	922,25	0,00	0,00

Figure 3: Aggregated (by sum) side-by-side display of two matrices grouped by *MainZoneNo* for the rows and *Zone type* for the columns with a filter on zone types 1, 2 and 5 applied

Matrix Editor in VISUM 11.5

PTV Vision VISUM

The settings for filtering and aggregation are saved in the version or optionally as a layout file (*.mly) which can be used to apply the settings to other matrices.

Another helpful tool for matrix analysis is the ability to apply contents-based formatting to the matrix editor grid. The formatting is configured through the graphic parameters of the matrix editor. Distinct formats can be applied to active and inactive OD pairs and the diagonal. For active OD pairs, the formatting can be defined according to a classification of matrix values similar to the classification of values for link bars. This is especially useful to highlight outliers or minimal values.

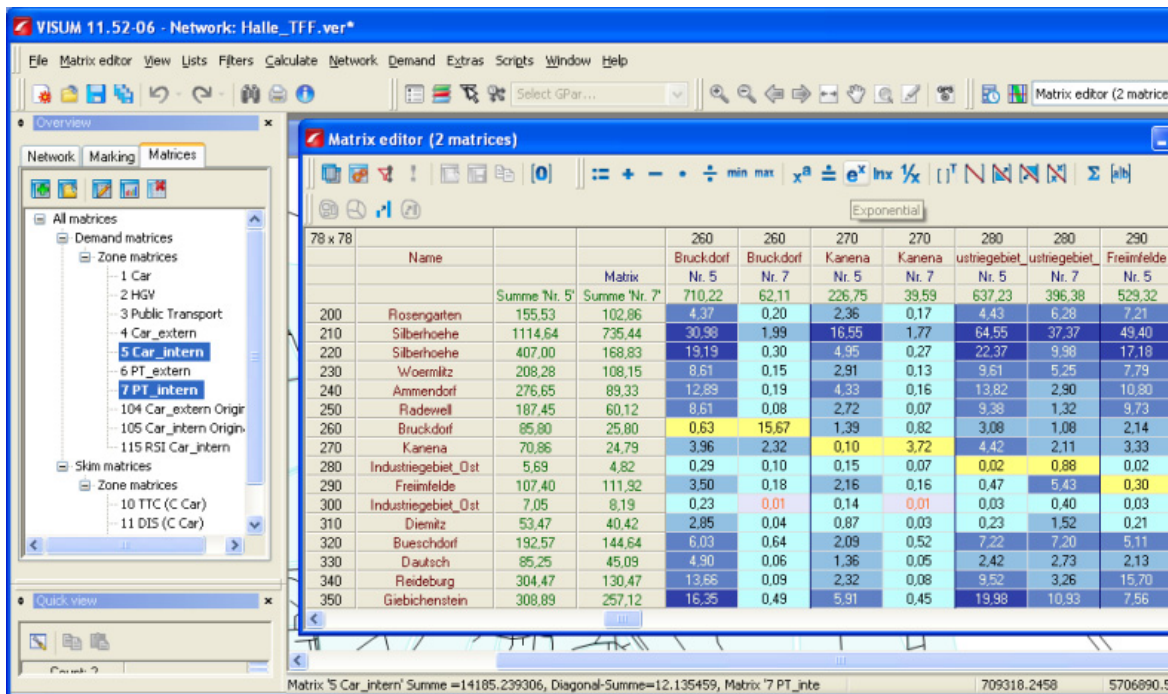


Figure 4: Side-by-side editing and contents-based formatting of two matrices