

VISUM Release Notes

Version 9.5

Version 9.52-02

Last modified: 2007-01-03



Stumpfstr. 1
D-76131 Karlsruhe
Phone: +49/721/9651-313
Fax: +49/721/9651-299
e-mail: hotline.visum@ptv.de

9.52-02 Corrections, Bug Fixes and Extended Functionality (ID) Jan. 03, 2007

Procedures

- ▶ *PuT assignment - Headway-based*: The assignment has been drastically accelerated and is now nearly as performant as in VISUM 9.4 (with noticeably improved stability and accuracy, cf. #5490). **(5612)**

COM Interface

- ▶ Muuli (to be exact: ScriptMuuli.dll) can now be registered as COM server again. **(5614)**

Add-Ons

- ▶ *LLE*: The dwell time of a time profile item now only enters the service time and section service time if the vehicle journey exceeds the stop on the considered day. Dwell time at the end of the vehicle journey is thus ignored. The same applies if, on the considered day, a stop of the vehicle journey is followed by a "gap". **(5575)**

9.52-01 Corrections, Bug Fixes and Extended Functionality (ID) Dec. 29, 2006

Discarded Program Crashes

- ▶ *Timetable editor*:
 - The program no longer crashes when deleting a time profile in the line route dialog box which is simultaneously displayed in the timetable. **(5551)**
 - VISUM no longer crashes when activating the list of vehicle journey sections right after the insertion of new vehicle journeys (error did not occur until VISUM 9.52-00). **(5570)**
- ▶ *Shortening a line route*: Crashes no longer occur when shortening a line route at the end while the last as well as the last but one item of the former course is a node stop point or a directed link stop point and not just a node. **(5547)**
- ▶ *COM*: VISUM no longer crashes when executing a script with limited access rights. Standard user and administrator rights did not cause any problems in the past either. **(5558)**
- ▶ *Detectors*: Crashes no longer occur when inserting detectors while the log file is activated. **(5573)**
- ▶ *Delete POI category*: VISUM no longer crashes when deleting a POI category. **(5602)**

Procedures

- ▶ *PuT assignment*: Dialog box *Procedures - [FUNCTIONS] - Volumes*: When editing setting *Save volumes/DemSegment* for PuT DSegs, VISUM only discards the assignment results for those DSegs that are allocated anew. All other results are obtained. Example: Save A at B, calculate A and B, then change storage of A to C -> the results of assignment A are discarded, the ones of B are obtained. **(5217)**
- ▶ *PuT assignment - Headway-based - Choice*: in the headway-based assignment, route choice decisions are now calculated precisely up to 50 alternatives (i.e. through integration of the density function). Previously, an accurate computation was only possible up to 10 alternatives due to numerical stability issues. A suitable transformation of the integrand now allows a considerably higher accuracy. Thus, minor deviations in the assignment result may occur. See also #5490. Work on the reduction of the computation time is in progress **(5610)**

Other Procedures

- ▶ *Choice model parameters for trip distribution/mode choice etc.*: after setting the value for c in the choice parameters, it is no longer displayed with a reverse sign on the [FUNCTIONGRAPH] tag. **(5598)**

Network Editor

- ▶ *Node topology*: Lane turns are no longer discarded if the TSysSet of the concerned link is edited. The data at the node leg are discarded only if a link is fully blocked or activated anew. **(5527)**
- ▶ *Vehicle journey items*: When accessing relation *time profile item\vehicle journey items\...*, the vehicle journey items are now generated automatically, even if they did not exist previously. **(5516)**
- ▶ *Shortening a line route at the start*: If a time profile is adjusted in such a way that a new start profile point is generated in a position which is occupied by a route point already, the run time on the first section is now calculated correctly from the former value on a pro rata basis. **(5139)**
- ▶ *F3 Search dialog*: Pressing **ENTER** no longer results in closing the Search dialog opened with F3 but in autozooming on the currently selected object. **(5017)**

Network Graphics

- ▶ *Link bars*: *Like bar width* is now set as default filling of a newly inserted link bar instead of *TypNo* because it is the most frequently used setting. **(5355)**
- ▶ *Automatic class definition*: When classified parameters are set simultaneously, VISUM now also applies setting *color = fill color* to the individual classes. **(5543)**

Attribute Interface

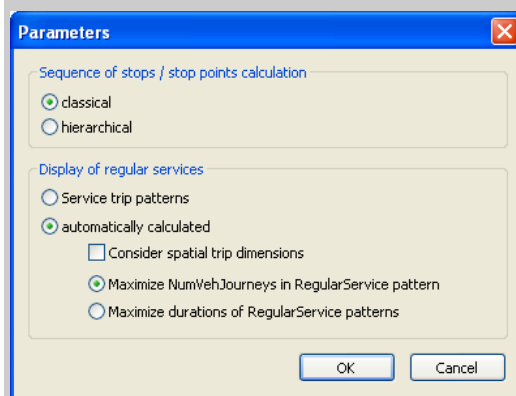
- ▶ Menu NETWORK - USER-DEFINED ATTRIBUTES: The check box for attributes of type *Bool* works correctly again. (5585)

Timetable Editor

- ▶ *Export to clipboard*: During the export of the tabular timetable VISUM now translates all attribute IDs, i.e. they do not all come up in English. (5552)

- ▶ *Automatic identification of regular services*: Via a new option in the *Parameters* dialog box, for the regular service display, users can maximize either the duration, as before, or regular services with several vehicle journeys. (5556)

Example: A cycle with vehicle journeys every hour from 5 am to 11 pm containing a cycle with vehicle journeys every 30 minutes between 8 am and 8 pm used to be displayed as one hourly cycle plus another (shifted) hourly cycle. When selecting option *Maximize NumVehJourneys in RegularService pattern*, the program now displays an hourly cycle from 5 am to 7 am, then another cycle with vehicle journeys every 30 minutes and, finally, past 8 pm, an hourly cycle again.

**Matrix Editor**

- ▶ *Path specifications of matrices*: From now on, the program saves a relative path if the path of a matrix matches the current project directory settings in order to facilitate the portability of networks. (5509)
- ▶ *Separator*: A comma is now accepted as decimal separator in all dialog boxes when entering numerical values. (5530)
- ▶ *Log display*: all columns are now initially visible in the log display of the matrix editor. (5591)
- ▶ *Read Muuli Logfiles*: Muuli Logfiles can be read in again. Older Muuli Logfiles saved with VISUM 9.5 are invalid and not supported. (5601)

Listings

- ▶ *Columns dialog*: An attribute can now be added with its subattribute values all at once. (5535)

Import Interfaces

- ▶ *EMME/2*: User-defined EMME/2 attributes at line route items ("us1", "us2") are now saved exactly at the corresponding items. So far, the value for the first item was saved at the second item and the one for the second item at the third item and so on. (5528)
- ▶ *GIS objects*: are no longer read in incorrectly if the first imported surface is negative. (5548)
- ▶ *Shapefile import*: when reading in Shapefiles, attributes following fields of type *Date* are now read in correctly. (5605)

Export Interfaces

- ▶ *XML export of the distribution parameters*: The gravitational options are now saved correctly. (5560)
- ▶ *VISSIM*: The VISSIM connector attribute *Desired direction* generated on export changed to "all" (instead of "right"). (5510)

Add-Ons

- ▶ *Traffix*: Result files can now also be activated if the file name of the VISUM network or version file contains more than one '.'. (5549)
- ▶ *TFlowFuzzy*: The specified tolerance range may now deviate from the counted value by 100% or more. (5550)
- ▶ *PuT passenger survey*: PuT flow bundles now also yield flow bundle volumes for some network objects (links, stop points, etc.) if the DSeg under consideration stems from a passenger survey and has been assigned "directly". (5579)
- ▶ *LineCosting*:
 - If the same TSys is boarded several times within the course of a PuT path, each boarding now adds to the attribute *PTripsTSys*. (5559)
 - Territory-based demand indicators are now only deleted when dismissing PuT assignments, and no longer if just PrT assignments are concerned. (5567)

Miscellaneous

- ▶ *Reading networks:*
 - Files can now even be read additionally if the loaded network contains POIs, stops, or backgrounds only. (5531)
 - VISUM8 network files can be read in directly again. (5536)
- ▶ *Co-ordinates systems:* co-ordinates systems of type "Double_Stereographic" and "Oblique_Stereographic" are now supported. (5597)
- ▶ *Use file name as document name:* Even when a version file is opened with a double-click in the Windows Explorer, VISUM now automatically suggests the present path when saving a version file later on. (5561)

Discarded Program Crashes

- ▶ *EMME/2 import:* VISUM no longer crashes if an attribute is selected on tag [TTF] which does not exist in the imported network. (5503a)

Procedures

- ▶ *PuT assignment:*
 - The globally set maximum time for path legs of type PuTAux now also affects the PuT shortest path search. So far, this bound used to take effect in the *Branch&Bound* search only. (5478)
 - The *Mode (VISEM)* setting on tag [SKIM_MATRICES] of the assignment parameters is no longer disregarded when saving a version file. (5458)
 - Considerably less storage is needed to calculate assignments with TSys PuTAux. (5491)
 - *Timetable-based:* A "preselection" of the connections is now also possible if the paths are not generated through a connection search but via a file import or by reusing the paths of a different DSeg. This is of special importance if the assignment period to be used differs from the one used during the original connection export. (5364)
 - *Headway-based:* In some of the applications it became apparent, that headway-based assignment showed a highly sensitive response to network modifications. In too many cases, adding another option (e.g. a new PuT line or even just an additional walking link) took an effect on route choice even for relations which were not directly concerned by these changes to the network. This instability could be discarded by fundamental re-engineering of the computation cernel. Caused by these changes, assignment results differ necessarily now. Especially in small-meshed networks, significant deviations may occur. But then, today's results are much more precise and robust compared to VISUM 9.4. (5490)
- The higher level of accuracy leads to an increased calculation time. Yet this will be improved in the near future.

The following option has been added on tag [SEARCH] of the *Procedures* dialog box:

Approximate shares calculation

Number of simulations per step [10, 1000000]

The new parameter regulates the accuracy of the approximate shares calculation. The more simulations calculated, the more accurate the result. An approximate calculation is inevitable whenever there are too many suitable options at a decision point (e.g. a boarding stop) so that an accurate calculation is no longer arithmetically reliable. This is the case from option ten approximately and the polynomial to be integrated then has level ten and very high coefficients as a rule. Here, only one approximation has been used so far, which varied tremendously from the actual result thus affecting the stability of the assignment procedure (see above). VISUM will use a more reliable simulation method in the future.

Network Editor

- ▶ MULTISELECT TURNS - DELETE: Passive turns that are blocked for all TSys are now also excluded. The blocking of TSys in general does not influence the active/passive status of network objects. (5501)

Attribute Interface

- ▶ *Vehicle journeys and vehicle journey sections:* The start and end of these attributes can now be edited directly via the attribute interface (e.g. via COM, MULTISELECT - EDIT or in listings). (5464)
- ▶ *Indirect attributes:* All listings now offer the statistics lines *Min*, *Max*, *Sum* and *Avg* for attributes with aggregate function "count". (5499)
- ▶ *Node attributes:*
 - *New attribute "coordinated":* Traffix attribute *coordinated* used to be available for NEMA only, yet is also needed for non-NEMA-SCJs. Therefore, the attribute is now available on tag [TRAFFIX] of the node dialog box via option *LSA is coordinated* instead of at the SCJ. (5482)
 - *LossTime:* At signalized nodes with signal group-based SCJs for Traffix, node attribute *Loss time* is now used. So far, the attribute used to be available to ICU procedures only when *Own cycle and loss time* had been activated.

The screenshot shows a dialog box with two sections. The top section is titled "Only, if either based on signal groups or not allocated to any SCJ" and contains a text input field labeled "Loss time" with the value "0". The bottom section is titled "Only for ICU procedure" and contains a checked checkbox labeled "Own block time" and a text input field with the value "0".

Now, the *Loss time* can be set in a group box called *Only, if either based on signal groups or not allocated to any SCJ*. The use of this attribute is thus no longer linked to option *Own cycle and loss time* and is now called *Own block time*.

This may lead to changed results in the very unlikely case that both an ICU procedure as well as a NEMA or stage-based SCJ have been allocated and the loss times differ. (5483)

COM Interface

- ▶ *Visum.LoadVersion:* VISUM now always refreshes the network after the use of this command. (5500)
- ▶ *SaveToArray:* The export of a PuT path leg list via *SaveToArray* is much faster now. (5496)

Import Interfaces

- ▶ *HAFAS import:* Several format extensions in the HAFAS-METABF file are now read in correctly. Transition times can now be imported to the split second. The remaining extensions take no effect in VISUM. (5486)
- ▶ *EMME/2-Import:* On tag [TTF], a new option *PrT time* is available. It is used to select the standard PrT link run time as the data source for the run times of the lines which is only known after the import of the links. (5503b)

Add-Ons

LLE: In some instances, errors occurred when calculating PuT Operating Indicators (see attribute list below). The errors have now been fixed. (5494)

Below, a detailed description of the situation that led to the error:

In the course of the procedure, each vehicle journey is divided into sections on which the maximum of the projection factors of all vehicle journey items that run on that section is constant. Here is a list of the conditions that led to an error when determining these sections:

- ▶ A vehicle journey has more than two vehicle journey sections.
- ▶ Vehicle journey sections use valid days with varying projection factors.
- ▶ If two sections have been defined already and a third vehicle section is found which has a boarding stop that lies within the last section already found, the resulting third section is then ignored by mistake.

Example	Errors:
<p>The diagram shows a horizontal timeline from Stop 1 to Stop 12. A top section labeled 'VJ' spans from Stop 1 to Stop 12 with a projection factor of 10. A bottom section labeled 'VJS' spans from Stop 1 to Stop 11 with a projection factor of 365. The section from Stop 11 to Stop 12 is not covered by any line, indicating it was ignored.</p>	<p>In this example, the section ranging from stop 11 to stop 12 (with projection factor 10) is ignored. The calculations of attributes depending on it were faulty.</p>

The affected indicators were:

Indicator	Affected tables
ServiceKm/time	Operator, TSys, Main line, Line, Line route, Time profile, Vehicle journey
OperatingKm/time	Operator, TSys, Main line, Line, Line route, Time profile, Vehicle journey
NumServiceTrips	Vehicle journey item, TPIItem, LRItem

NumServiceTripsProp	TPIItem, LRItem
Cost	TSys, Operator, Territory, Main line, Line, Line route, Time profile, Vehicle journey
StopCost	TSys, Operator, Territory, Main line, Line, Line route, Time profile, Vehicle journey
OperatorCost	TSys, Main line, Line, Line route, Time profile, Vehicle journey
NumDep/Arr	SP, Stop
NumDep/Arr-TSys	SP, Stop
NumServiceTrips	SP, Stop, Zone
NumServiceTrips-TSys	SP, Stop, Zone
MServiceTripLength	TSys, Main line, Line, Line route, Time profile
MServiceTripRunT	TSys, Main line, Line, Line route, Time profile
TransportMode	Main line, Line, Line route, Time profile, Vehicle journey
CostCovTot/Perc	TSys, Operator, Territory, Main line, Line, Line route, Time profile, Vehicle journey

Further LLE modifications:

- ▶ *PersKm_DSeg* and *PersH_DSeg* are calculated correctly again when picking ...x *VehicleCombination*. (5475)
- ▶ *PTripsUnlinked*: If passengers board the same line several times within one path, each boarding is now considered a *PTripUnlinked*. (5511)
- ▶ *PersKm time interval-based by territory*: The calculation of territory-based demand indicators has been modified. This was necessary as the time interval-based calculation of *PersKm/PersH/PersKm-NSeg/PersH-DSeg* used to contain errors under certain circumstances.

So far, these indicators were determined from the volumes at time profile items. However, an error used to occur if a time interval began at a node which was neither stop point nor route point so that no time profile item was available for that node. The current time profile item produced a volume of 0 for the interval though. For that time interval no volume could thus be determined in an assignment and the corresponding indicator was set to 0 for the link starting at the node. (5440)

Therefore, the indicators are now calculated by iterating all paths and by distributing the path volume to the traversed links which are then calculated by territory, as before. Please note, however, that in order to execute the calculation, the paths need to be stored as connections. Adjust under CALCULATE - PROCEDURES - FUNCTIONS - PUT-FUNCTIONS - [VOLUME]: *Save path as connections*. If the paths are not saved as connections, the indicators for time intervals are not calculated correctly.

The following applies when calculating the time intervals:

- The results are always summed up in the time interval that is start at the start of the path.
- The revised calculation of the indicators only requires longer computing times if time intervals have been defined.

Miscellaneous

- ▶ *Column selection dialog box*: The number of decimal places is now displayed correctly from the start. (5446)
- ▶ *Writing network files*: When using mode *Save only active network objects* for the export, stop-based data like transfer walk times are now saved for active stops only. This way, warnings no longer interrupt the import of such files. (5497)
- ▶ *Reading a network*: Just like other attributes, the link type now remains unchanged when reading in mode *Overwrite attribute* if it is not listed in the table of links. (5498)
- ▶ *New volume-delay function*: A new function, *Akcelik2*, has been added. The usual *Akcelik* function requires many different volume-delay functions, as the parameter *d* equals the lane capacity. The denominator of the new function references directly to the capacity which can reduce the number of different volume-delay functions. Unlike *Akcelik*, the new function is no waiting time function at a node but represents the speed reduction on a link and should thus be used in connection with links only.

The new function looks like this:

$$t_{\text{cur}} = 3600 \cdot \text{length} \cdot \left[\frac{1}{v_0} + \frac{a}{4} \cdot \left((\text{sat} - 1) + \sqrt{(\text{sat} - 1)^2 + \frac{8 \cdot b \cdot \text{sat}}{d \cdot a \cdot q_{\text{max}}}} \right) \right]$$

where *a* = duration in hours

b = family parameter

d = capacity of a lane per hour

q_{max} = capacity of the network object (link). (5481)

- ▶ *Volume-delay function Schiller*: Due to methodical problems, this function type is not available for the time being. (5480)

Discarded Program Crashes

- ▶ *Normalizing surfaces*: VISUM no longer crashes when reading in complex zone or territory polygons with directly recurring consecutive points. (5427)
- ▶ *Filter on vehicle journey items*: Users can now also specify filters on the level of vehicle journey items if no vehicle journeys exist at that time. They are generated automatically in the background. (5422)
- ▶ *COM*:
 - VISUM no longer crashes using *GetMultipleAttributes* or *SetMultipleAttributes* if one of the transferred attribute IDs is invalid. (5448)
 - Writing access to non-editable attributes via *AttValue* now lead to a COM error. So far, VISUM used to freeze in this kind of situation. (5467)
- ▶ *NETWORK - LINK TYPES*: VISUM no longer crashes when clicking option *Types* if it is activated already. (5452)
- ▶ *MULTISELECT ZONES - GENERATE*: Crashes no longer occur if a user aborts the operation via button CANCEL. (5459)
- ▶ *TFlowFuzzy*: The program no longer crashes during the execution if no (separate) paths have been saved for the DSeg under consideration. (5470)
- ▶ *Deleting a link*: When deleting a link at a node which is signalized, references to deleted leg turns might remain in the network. This leads to crashes, e.g. when writing version files. (5485)

Procedures

- ▶ *PuT assignment*:
 - *Fares*: The calculation of fares of fare zone based ticket types has been accelerated. (1427)
 - *Timetable-based assignment with Branch&Bound*: Now, also transfers between path legs travelled in the same PuT-Aux-TSys are permitted, if a combined path leg is not possible. This applies if the connecting turn cannot be used by the PuT-Aux-TSys. (5477)
- ▶ *PrT assignment*:
 - *Dynamic*: VISUM now issues an error message if no demand time series has been allocated to the DSeg to be assigned. (5340)
 - *Blocking-back model*: Queue lengths and waiting times produced by the model are now also saved when calculating a PrT skim matrix after the assignment. (5472)
 - *Dynamic Stochastic*: Minor deviations can now occur in the assignment due to the elimination of a numerical instability. (5474)

9.51-02

Corrections, Bug Fixes and Extended Functionality (ID)

Nov. 22, 2006

Other Procedures

- ▶ *Shortest Path Search - PrT*: VISUM now issues a warning message once if no path can be found and no longer every time the network is refreshed. (5428)
- ▶ *Trip generation - Parameters*: A row can be removed from the grid via button DELETE ROW again even it is not selected via cell "+" but any other cell. (5423)

Network Editor

- ▶ *Editing shapes*: When shifting an intermediate point of a boundary to the position of an intermediate point of a different boundary, the next intermediate point of the boundary is no longer left out. (5460)

Attribute Interface

- ▶ *UDAs at service trip items* can now also be manipulated via MULTISELECT - EDIT or via procedure "Edit attribute" if the objects had not been generated yet. They are now generated by default in this situation. (5230)

COM Interface

- ▶ *Menu LISTINGS - PASSENGER TRANSFERS - TIME PROFILES*: The list can now be restricted to a specific time profile via *SetObjects*. So far, it just contained data on the first time profile. (5453)

Listings

- ▶ *PuT path legs - Fares*: Fares can now also be selected per path leg if the list display is restricted to PuT path legs. (5435)
- ▶ *Transforming co-ordinates*: Any lists that are open during the transformation are now refreshed automatically. (5449)

Add-Ons

- ▶ *EWS*: The output window issues EWS results again. (5447)
- ▶ *Timetable Network Graph*: The handling has been improved. VISUM now issues detailed status messages at the beginning of the procedure; the procedure can be cancelled interactively in the first stage. The run time of the initialization stage has also been reduced and the former menu item INITIALIZE which had been used to activate the recalculation of the graph, is now called RECALCULATE. (5451)
- ▶ *Reading EDF files*: VISUM no longer blocks U-turns if table TURN is missing. (5434)
- ▶ *Subnetwork generator*: Demand matrices are now created faster during the generation of a subnetwork. (5454)
- ▶ *LineCosting*: When links are only partly traversed, this is now always taken into account when calculating time or distance-based indicators (like *ServiceKm* or *EmptyTime*) by precise territory. This modification is only relevant in the occurrence of link stop points in the network. (5380)

Miscellaneous

- ▶ *Reading network files*:
 - VISUM no longer dismisses line routes with missing stop point references at individual items when reading in line route courses if at least one correct node is specified. (5432)
 - When completing line routes, VISUM now also finds a permitted line route if the start or end stop is located on an undirected link stop point and if the link is blocked in one direction for the TSys of the line. (5445)
- ▶ *Reading version files*: When reading VISUM 8 version files, the name of a line is correctly divided into the constituents line - direction - line route again if the total length equals the maximum value of 20. (5441)
- ▶ *Detailed trace files*: Trace files of timetable-based assignments are now saved to the project directory folder specified for version files and no longer to the EXE directory of the VISUM installation. (5461)

9.51-01

Corrections, Bug Fixes and Extended Functionality (ID)

Oct. 31, 2006

Discarded Program Crashes

- ▶ *Create link*: Crashes no longer occur when repeatedly creating links with intermediate polygon points. (5383)

Procedures

- ▶ *PuT assignment - Headway-based*: In case of overlapping coupling groups, VISUM not only issues a general warning but also records all conflicts in the trace file. (5387)
- ▶ *PrT assignment - Dynamic*: When setting option "Save dynamic route volumes - only total" under [FUNCTIONS] - *PrT-Functions - Volume*, the program now considers the total of all time intervals and not just the volume of the first interval. (5410)

Other Procedures

- ▶ *Line Blocking*: Vehicle journey sections can now also follow one another if the total of the distance of time and the supplements exceeds the length of the analysis period. (5414)

Network Editor

- ▶ *Aggregating line routes*: During the aggregation, permitted boarding and alighting stops on time profiles are no longer lost. Thus, the following situation no longer leads to the procedure being cancelled: Two time profiles - A and B - are aggregated, a shortened vehicle journey runs on time profile B and on time profile A boarding/alighting is not permitted at the first and the last stop of the vehicle journey. (5420)
- ▶ *Coupling of time profiles*: During the process, vehicle journeys that start exactly at the end of the coupled section are no longer deleted. (5417)

Timetable Editor

- ▶ *Cell selection*: In the timetable tableau, users can now select individual cells (not entire rows) again. (5389)

COM Interface

- ▶ *Running a Python script*: A detailed warning is now issued when terminating VISUM whilst running a Python script. (5409)

Miscellaneous

- ▶ *Column charts*: The graphic parameters of the column charts are now also saved to the graphic parameter and version files if no chart is open at the time. (5385)
- ▶ *ANSI*: Error and trace files are now also saved without UTF-8 Byte order markers when selecting character code=ANSI. (5403)
- ▶ *Difference network*:
 - When generating a difference network, line routes and time profiles of the two networks are now also identified as identical (and thus inserted as **one** object in the overall network) if the order differs according to the sorting by *ID* or by *name*. (5413)
 - The 2D-display can now also be used in difference networks. (3433)

Discarded Program Crashes

- ▶ *User-defined attributes*: VISUM no longer crashes when clicking the column header of an attribute of type *File* on tag [USER] in order to activate dialog box *Open file*. (5357)
- ▶ *Active protocol*: VISUM no longer crashes
 - if a mode that is referred to by a demand segment is deleted. (5373)
 - when copying a line route with a time profile that has a reference item which ceases to exist when shortening the course in the process. (5367)
- ▶ *Create opposite direction*: In rare cases, creating the opposite direction of line route courses traversing directed stop points on links caused a program crash. This bug could be fixed. (5363)
- ▶ *Shortest path search*: VISUM no longer crashes when deleting network objects located on the current course of a shortest path. (5379)
- ▶ *Timetable Editor*: VISUM no longer crashes when increasing the widths of columns after editing the overall window sectioning. Nor do asynchronous rows emerge in the upper left and right window sections. (5388)
- ▶ *COM*: The COM methods *Turns.ItemByKey* and *Turns.ExistsTurnByKey* now cause a regular COM error if one of the transferred nodes does not exist in the network. The situation led to a crash in the past. (5399)
- ▶ *Legend Wizard*: The program no longer crashes
 - when switching from the legend wizard to the execution of a python script within VISUM. (5400)
 - on tab 4 of the Legend Wizard in case of an empty network and empty legend parameters (5408)

Procedures

- ▶ *Blocking-back model:*
 - *Remaining capacity:* If all downstream turns of a link are blocked, the outgoing capacity of the link equals 0, i.e. the traffic cannot exit the link. However, if at least one open destination connector starts at the ToNode of the link, the outgoing capacity is now set to infinite, so that traffic can flow freely to the destination connector. (5374)
 - *Turn volumes:* In cases where the volume of a turn had been reduced by the blocking-back calculation, the amount deducted from the turn volume used to be too large. Values at links and connectors were yet accurate. The error has been fixed. (5377)
 - *Node capacity:* is now also regarded in phase 2 of the computation (applies only if Cap from "Link and Node capacity" or from "Turn and Node capacity" is active) (5407)

Network Editor

- ▶ *Line routes dialog:* The reference journey dropdown box on tag [TIME PROFILES] is now visible right away in any case. (5323)
- ▶ *Refresh:* The network is now automatically refreshed when exiting the *Multiselect edit* dialog box so that any modified attributes are displayed correctly right away. (5382)
- ▶ *Link length and link run time of line routes and system routes:* These attributes are now also issued accurately if certain links are only partly traversed (because the route starts or ends at a link stop point). (5354)
- ▶ MULTISELECT - EDIT: The *Formula* dialog box can now be closed correctly though no object was edited. (5384)

Network Graphics

- ▶ *Network scale:* In the graphic parameters, the network scale 1:2500000 can now also be used for a zoom level-dependent display. (5376)
- ▶ *Reading graphic parameters:* When reading selected parameters, the parameters of the legend are now only read in if "Legend" is actually selected in the list. (5371)
- ▶ *Scaling images:* Image size (bmp, jpg) is now computed correctly for Printing and Preview. (5404)

Matrix Editor

- ▶ *Code files:*
 - can be imported again. (5406)
 - For the gravity calculation, code files may now contain blank lines or comments at the end. (5405)

COM Interface

- ▶ *AttValue:* A detailed error message is now issued if the Save command fails (e.g. due to the fact that an attribute is not editable). (5366)
- ▶ *Alternative Iterator:* VISUM now offers a new iterator method to run network object containers via COM which delivers high performance in calculating time and does without an explicit array of all network objects as required for *GetAll*. For a detailed description and examples, please refer to the COM documentation. (5337)
- ▶ *Running a script:* VISUM now also displays tooltips and status bar information in the network window when simultaneously running a python script. (5397)
- ▶ *NetPara.AttValue:* The writing access to *NetPara.AttValue("SCALE")* now also correctly considers the current system of units. (5396)

Export Interfaces

- ▶ *VISSIM/Synchro-Export:* The attribute interface (VISSIM/Synchro parameter files) was updated (5316)

Add-Ons

- ▶ *LineCosting:* When links are only partly traversed, this is now always taken into account when calculating time or distance-based indicators (like *ServiceKm* or *EmptyTime*) by precise territory. This modification is only relevant in the occurrence of link stop points in the network. (5380)

Miscellaneous

- ▶ *Reading incomplete line routes:* A sequence like node A - undirected stop point on link B - node A is now routed correctly; a line route of that type will no longer be discarded after reading. (5362)
- ▶ *POI/GIS filters:* Filter criteria of POI and GIS categories are now permanently saved for each category. (4829)

Discarded Program Crashes

- ▶ *PuT assignment - timetable-based*: The program no longer freezes when opening the parameter dialog of the assignment after altering the analysis time period in such a way that the assignment period of a procedure becomes invalid. (5344)
- ▶ *Generating system routes*: VISUM no longer crashes if there are line route items between two stops either with or without zigzag routing before the end stop. (5346)
- ▶ *COM*: Crashes no longer occur when calling VISUM via option *-reg*. (5356)

Network Editor

- ▶ *Shifting a stop point on a link*: The line route lengths are now also adjusted correctly if the shifted stop point is the start stop point of the line route. (5345)

Network Graphics

- ▶ *Polygons*: The drawing of polygons with a broken line has been accelerated. (5324)

Attribute Interface

- ▶ *Queue length*: References to link attribute *Queue length (...)* contained in a graphic parameters file are no longer reset to *Queue length (AP)* when reloading the file. (5349)

Miscellaneous

- ▶ *Saving versions*: The additional memory requirements have been reduced drastically. (5338)
- ▶ *Reading versions*: Invalid min./max. limits of user-defined attributes are now automatically adjusted. (5343)
- ▶ *Difference network*: Zones with identical numbers are now always identified in a difference network. So far, the program identified zones of the same type only. The type, however, should be irrelevant in this instance, just as it is the case for all other network objects. (5350)
- ▶ *Column chart*: When opening a second column chart, VISUM now uses the same size and layout of the existing window. (5351)
- ▶ *Windows 2000*: VISUM now also supports Windows 2000 if *CodeMeter* has not been started as a service beforehand. (5294)
- ▶ *Reading line blocks additionally*: The additive reading of block items in combination with option *Overwrite object* works properly again. (5348)

Discarded Program Crashes

- ▶ *Drawing flow bundles*: VISUM no longer crashes while drawing flow bundle bars if the section contains polygons with over 2048 points. (5317)
- ▶ *Difference network*: If a difference network cannot be opened (e.g. due to mismatching PuT directions), VISUM no longer crashes upon display of the respective message. (5313)

Network Editor

- ▶ *SINGLESELECT NODES - [LINK ORIENTATIONS]*: Following alterations of orientations, the program now always discards any resulting faulty topology. (5315)
- ▶ *TSys selection*: When editing TSysSets via *MULTISELECT EDIT - CONSTANT* or when filtering for TSysSets, users can now select only those TSys which actually make sense regarding the respective network object, e.g. just PuT line TSys at stop points or any TSys but Walk at turns. (5064)
- ▶ *Copying a line*: VISUM now also includes the main line reference when copying a line. (5322)
- ▶ *Coupling sections without coupled time profiles*: are now deleted at the end of all read operations (version & network files). (5318)
- ▶ *Zones*: The use of connector shares now also works correctly if the total of weights over all connectors exceeds $2^{31} = 32768$ at a zone. (5335)

Network Graphics

- ▶ *Printing*: Background items on "old" legends are printed correctly again. (5309)

COM Interface

- ▶ *Go to*: In a Go To loop, the current counter can now also be accessed via COM. The attribute is called *CurrentCounter*. It is part of the attribute interface of procedure "Go to the operation". (5310)

Add-Ons

- ▶ *LineCosting - Defining a territory*: In the past, links with a ToNode that exactly coincided with the position of the FromNode and that were located in the enclave of a territory, used to be considered as part of the territory. This led to falsified results in the calculation of territory indicators. The error has been fixed. The specified situation has yet occurred very rarely in practice. (5319)

Miscellaneous

- ▶ *Save version*: Query "Save version?" is only issued if changes have occurred since saving the version last. (5314)
- ▶ *Read XML file*: Attribute *PrTVolumesPara.NumDecPlaces* is always imported correctly when reading XML files. The faulty performance so far sometimes led to the unnecessary rejection of assignment results when reading in XML files. (5321)
- ▶ *Difference networks*: Problems caused by a memory shortage no longer occur when repeatedly opening difference networks. Even before loading a difference network, the current network is now entirely deleted. (5334)