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18.02-19 [155154]

2020-06-30

## ✓ Fixed Bugs


### Add-Ins

- ✓ Matrices with non-ASCII characters not found during OMX import: Matrices whose titles contained non-ASCII characters were not handled correctly in the 'OMX import' add-in. This error has been fixed. **(21498)**

### Data Model

- ✓ Update of the VD function number when renumbering link types: When the number was changed for a link type, link types with a higher number no longer had the VD function assigned to them. This error has been corrected. **(21176)**

### Demand Procedures

- ✓ Invalid matrix entries in the tour-based model: In the output matrices of the 'Tour-based model - Combined trip distribution/mode choice' procedure, numerical problems could lead to invalid values, which could not be used for further calculations. This error has been fixed. **(21246)**
- ✓ Negative values in mode choice matrices from a tour-based model: By executing the procedure 'Tour-based model - Combined trip distribution/mode choice' very small negative values could occur in the mode choice matrices for exchangeable modes. This error has been fixed. **(21473)** 

### Dialogs

- ✓ Sorting of line routes in route course layer: On the 'Display' page for route courses in the graphic parameters dialog, the objects (=line routes) were not sorted alphabetically if the aggregation level was 'Line routes'. This error has been corrected. **(21457)**

### Formulas

- ✓ Poor performance of matrix operations: Since PTV Visum 2020 SP1-3, some formulas, especially important matrix operations, have been evaluated more slowly than before. This affected not only the procedures 'Edit attribute' and 'Combination of matrices and vectors' but also the utility calculation in various demand procedures, e.g. 'Tour-based model - Combined trip distribution / mode choice'. This bug has been fixed. **(21305)**

### Graphical Procedures

- ✓ PrT flow bundle after equilibrium assignment LUCE: When calculating a flow bundle with conditions on main zones as the destination for a PrT demand segment assigned with the LUCE equilibrium assignment, the set of flow bundles always remained empty. This error has been fixed. **(20937)**

### Graphics

- ✓ Keep setting 'Draw' for classified display: If an existing classified display, for which drawing was switched off for individual classes, was changed using one of the actions in the menu 'Redefine all classes' (i.e. set colors, sizes, class name), all classes were then activated for drawing. This error has been fixed. **(21351)**

### Graphics-3-D

- ✓ GPU acceleration for mobile AMD graphics cards: GPU acceleration for mobile AMD graphics cards was not activated for PTV Visum in some constellations. This bug has been fixed. **(21284)**
- ✓ Wrong network scaling factor for imperial units: When displaying a network with imperial units in the 3-D network view, a set network scaling factor was applied incorrectly. This error has been fixed. **(21286)**

### Miscellaneous

- ✔ Certain messages not translated: Certain phrases with special characters, which occur mainly in message texts, were not translated. They were output in German, regardless of the language setting. This error has been fixed. (21518)

## Network Comparisons, Scenario Management

- ✔ Crosswalks were lost when applying a model transfer file: When applying a model transfer file or a modification in scenario management that changed separate right turns, existing crosswalks on the affected node legs were deleted. This error has been corrected. (21262)
- ✔ Renaming of transport systems in model transfer files: If the code of a transport system was changed in a model transfer file or in a modification of a scenario management project, node geometries defined in the network were lost. This error has been fixed. (21402)

## Network Comparisons, Visum Files

- ✔ Crash when applying multiple model transfer files: Previously, if several model transfer files were applied consecutively (or several modifications were loaded in a scenario management project) and one of the timetable editors was open, the system could sometimes crash. This error has been fixed. (21405)

## PrT Assignment

- ✔ Checking the length of crosswalks: The check of the length of crosswalks in the context of the node impedance calculation according to ICA (6th edition) was faulty. This error has been corrected. (21257)

## PuT Assignment

- ✔ Passengers alighting at the destination were missing in case of PuT Aux: If a public transport path ended with the use of a transport system of the type 'PuT Aux', the passengers alighting at the destination were not shown at the last vehicle journey item of the last PuT path leg covered by a PuT line transport system. This error has been fixed. (21431)

## Timetable Editor

- ✔ Crashes when line block display is open: No more crashes when editing networks or undoing network changes when the line block display is open in certain constellations. (18233)

## Visum Files

- ✔ Node geometry data when exporting lists to attribute files: When exporting a list as an attribute file, attributes whose values depend on node geometry data (for example, the number of legs of the node geometry in a node list) could sporadically fail to display the correct value. This error has been fixed. (20605)
- ✔ Reading of attributes with active flow bundle slow: The pasting of attributes from the clipboard and importing an attribute file was unnecessarily slow in case of an active flow bundle. This error has been fixed. (20052)

## ❗ Breaking Changes

### Demand Procedures

- ❗ Negative values in mode choice matrices from a tour-based model: By executing the procedure 'Tour-based model - Combined trip distribution/mode choice' very small negative values could occur in the mode choice matrices for exchangeable modes. This error has been fixed. Results change accordingly, especially in feedback demand models. (21473 ✔)

18.02-18 [153172]

2020-04-24

## + New Features and Changes

### Miscellaneous

- + Manual: The manual for PTV Visum 18 is available in French. (21279)

## PrT Assignment

- ⊕ Crash due to very high memory consumption in DUE: In the Dynamic User Equilibrium DUE, very large storage areas were requested, which could lead to a crash under certain circumstances. This problem is now avoided so that the assignment can be calculated in affected networks. **(21039)**

## ✓ Fixed Bugs

### Add-Ins

- ✓ Crash after attribute selection in 'Calculate Matrix': A crash no longer occurs when exiting the attribute selection dialog of the Add-In 'Calculate Matrix' via the 'Cancel' button. **(21065)**
- ✓ Crash in parameters dialog of 'EVA weighting': No more crash when closing the parameters dialog of add-in 'EVA weighting' if the region 'Liechtenstein' (or other regions that define non-ASCII characters as thousand separators) is set in Windows. **(21048)**
- ✓ No help for 'Import OD': The help did not open for the Add-In 'Import OD'. This error has been corrected. **(21171)**

### Data Model

- ✓ No reaction to deletion of planned connecting journeys: When deleting vehicle journeys, planned connecting journeys referring to them were not reliably deleted. A resulting inconsistent network could not be saved as a version file. This error has been fixed. **(21117)**

### Demand Procedures

- ✓ Formula matrices for nested demand: In the 'Nested demand' procedure, formula matrices are now also allowed as input matrices (outputs are still limited to data matrices). **(19519)**
- ✓ Parameters of 'Time-of-day choice' after changes in the demand data dialog: After exiting the demand data dialog and from there the editing dialog for a time series via 'OK', but without actual changes of the data, a 'Time-of-day choice' procedure that existed in the procedure sequence could not be executed anymore. This error has been corrected. **(20580)**

### Dialogs

- ✓ Find dialog passes on mouse clicks: If the Find dialog was called from a list or a list-like view (e.g. procedure sequence or dialog with tables), an underlying list (or dialog) reacted to a selection made in it by double-clicking, so that an entire section was unintentionally marked. This error has been fixed. **(20786)**

### Graphical Procedures

- ✓ Flow bundle does not correctly evaluate initially negated zone condition: When a negated condition was set at the origin zone in a flow bundle for private or public transport, this condition was not correctly taken into account until now. This error has been corrected. **(19445)**

### I/O Interfaces

- ✓ Departure times of destination coaches in HAFAS import: If a destination coach did not start at the start stop point of the first pulling journey, the arrival and departure times were shifted at the time profile items of the destination coach. This error has been corrected. **(21040)**

### I/O Interfaces, Timetable Editor

- ✓ Performance problem during HAFAS import with destination coaches: During HAFAS import a performance problem occurred when a destination coach was pulled by many different trains. In severe cases, the import could not be completed. This error has been fixed. Similarly, the line block view in networks with an annual calendar was affected when the blocking time interval was extended. The buildup of the line block view was also accelerated in these cases. **(20967)**

### Installation

- ✓ Fallback licenses do not always work: When checking for possible fallback licenses, possible licenses were not accepted if add-ons were made available via the product variant. This error has been fixed. **(21148)**

### Junction Editor

- ✓ Less delay in editing: The response of the junction editor when editing the node data has been accelerated, so that the junction editor can be operated more smoothly. **(20175)**

### Matrix Editor

- ✔ Matrices with a matrix sum 0 in the histogram: A matrix with the matrix sum 0 displayed in the matrix histogram previously prevented the correct calculation and updating of the matrix histogram display. This error has been fixed. **(19804)**

## Network Comparisons, Scenario Management

- ✔ Changes in the use of upper/lower case were lost in model transfer files: If you renamed an object with an alphanumeric key in such a way that only the upper/lower case changed, then this network object was not recognized as modified when you created a model transfer file or a modification in scenario management. Therefore, when the model transfer file was applied, the change in spelling was not restored. This error has been corrected. **(21002)**

## Network Editor

- ✔ 3-D network view with empty network: In the case of an empty network, the 3-D network view did not show a relevant part of the background map. This bug has been fixed. **(20788)**
- ✔ Messages when aggregating zones on the basis of main zones: When aggregating zones based on their allocation to main zones, the message about the adjustment of the matrices had to be confirmed separately for each main zone. This error has been corrected. **(20954)**

## Other Procedures

- ✔ Calculation error in noise calculation according to RLS90: Due to ID 20636 an error occurred in the calculation of the DTV, which led to wrong results in the noise calculation according to RLS90. This error has been fixed. **(21127)**

## PrT Assignment

- ✔ DUE assignment with blocking back did not terminate: Under certain circumstances, undesired loops could occur in the Dynamic User Equilibrium DUE when the blocking back calculation was switched on. As a result, the procedure entered an infinite loop. This error has been corrected by now writing such loops to the log file and not saving the affected paths. **(20752)**
- ✔ Extended route import freezes: The 'Extended route import' procedure got into an infinite loop if dynamic results were imported and there were already time intervals and user-defined attributes with these time intervals as subattributes in the target network. This bug has been fixed. **(20960)**

## PuT Line Blocking

- ✔ Bound vehicle journey sections were moved: When using the option 'Consider only unbound vehicle journey sections' in the line blocking calculation and a calendar existed, the days already covered by line block items were determined incorrectly. This error has been corrected. **(21057)**

## PuT Line Blocking, Visum Files

- ✔ Crash when saving procedure parameters with line blocking: A crash no longer occurs when saving a procedure sequence with a procedure step 'Line blocking' if there are a large number of vehicle combinations and lines in the network and the option 'Same line' (i.e. the generation of blocks of the same line) is selected on the 'Transport systems' page. **(20947)**

## Safety

- ✔ Incorrect weekdays in accident statistics: The weekdays were displayed incorrectly in the accident statistics. This error has been corrected. **(21054)**

## Timetable Editor

- ✔ Copy/Paste in the line route editor not possible via key combinations: In the two tables in the line route editor for line route items and time profile items, copy and paste of values only worked via the context menu, but not via the usual key combinations. This bug has been fixed. **(20101)**
- ✔ Crash when converting an empty trip into a vehicle journey: A crash no longer occurs when converting an empty trip into a vehicle journey via the line block items list or the line block display if the action is subsequently undone and the line block display is open. **(21045)**

## Visum Files

- ✔ Graphic parameters file with turn volumes for main nodes: No more crashes when saving a graphic parameters file or version file if the network contains main nodes, the graphic parameters contain turn volumes for these main nodes, and relevant network changes (e.g. deletion of a link, changing the allocation of nodes to main nodes) have been made. **(21007)**
- ✔ Number of decimal places of matrices was lost in version file: The number of decimal places of a matrix was reset to the default value (that is 3) when writing and later reading version files if a higher value was set. This error has been fixed. **(20850)**

18.02-17 [151081]

2020-02-11

## + New Features and Changes

### I/O Interfaces

- + Separator for railML and Hafas import: Since commas in line names are not forbidden but nevertheless very problematic (see ID 20255), the default value for the separator between the name components in the Hafas and railML import has been changed to '-'. In addition, forbidden semicolons in line names are no longer replaced by commas, but also by hyphens. This second measure also changes the result of the import when using existing PuT import project files (\*.puti), if the data used for names contains semicolons. **(20780)**

## ✔ Fixed Bugs

### Data Model

- ✔ User-defined attributes deleted after renumbering POI categories: After renumbering a POI category, the user-defined attributes of this POI category were no longer listed in the attributes list. The values for individual POI objects still existed. This error has been fixed. **(20896)**

### Demand Procedures

- ✔ Time series with empty shares in VISEM: If there is a time series in the demand model, where all shares have the value 0, the execution of the procedure 'Tour-based model - Combined trip distribution/mode choice' resulted in matrices with invalid values for those selected outputs, where only a part of the day is selected (start time > 0 or end time < 24h). This error has been fixed. **(20934)**

### Dialogs

- ✔ Missing attributes below search results in attribute selection: When searching in the attribute selection dialog, elements below a search result were filtered again in some constellations. As a result, sometimes only those attributes whose name also contained the search string were displayed next to a relation whose name contained the search word. This error has been fixed. **(19920)**

### Filters, Visum Files

- ✔ Inactive object selection is lost in filter files: If a filter that had an object selection that was currently inactive was saved as a filter file, the selected objects were not written to the filter file if the filter had no filter condition. This error has been corrected. **(1533)**

### Graphics

- ✔ Crash when combining route course and lane allocation: Crashes no longer occur when drawing the network if both the lane allocation and the route course layers are activated in the graphic parameters. **(20870)**

### I/O Installation

- ✔ Display name set incorrectly by update: Up to now, the display name in the list of installed programs was set incorrectly by updates. This incorrect display name was displayed under 'Uninstall programs', for example. This error has been fixed. **(20856)**

### I/O Interfaces

- ✔ \*L lines in HAFAS import: The import of HAFAS data failed under certain conditions if the line name specified in an \*L line in the timetable file did not consist of 8 characters. This error has been fixed. **(20518)**

- ✔ Crash when exporting to MaaS Modeller: No more crashes when exporting a network without a specified co-ordinate system to PTV MaaS Modeller. Export is not possible in this case, and the attempt is now aborted with an error message. **(20879)**

## Main Window

- ✔ Download and Release Notes on the Start Page: The Download and Release Notes buttons in the notification of new service packs on the Start Page no longer worked. This bug has been fixed. **(20790)**

## Network Comparisons, VISUM Files

- ✔ Unnecessary vehicle journey items in model transfer files: Vehicle journey items of changed vehicle journeys were saved to model transfer files even if they did not carry any data. This error has been corrected. **(20944)**

## Network Editor

- ✔ Several copyright notices for static Bing maps backgrounds: Under certain circumstances, the copyright notices for static Bing Maps backgrounds were displayed multiple times. This error has been fixed. **(20838)**

## PuT Assignment

- ✔ Crash when calculating PuT skim matrices in headway-based assignment: No more crash when calculating PuT skim matrices in the headway-based variant with several cores. **(20847)**
- ✔ Crash when using TSys-based paths after network change: Accessing the paths of a transport system-based assignment (e.g. by path list or evaluation of the OD pair filter) no longer leads to a crash if the network is changed after the assignment. **(20222)**
- ✔ Determination of the relevant fare zones for traversed stops: In the fare calculation for zone fares or other fares limited to fare zone types, so far all stops of all used line route items of a public transport path were considered, i.e. also those stops at which the time profile did not provide for boarding or alighting. If the user-defined network attribute 'FareModel\_RegardStopsWithBoardOrAlightOnly' has the value 'true', this behavior can now be switched off, so that only those stops are considered where the used vehicle journeys or time profiles stop. **(20983)**

## Scenario Management, Visum Files

- ✔ Chained up vehicle journey sections were lost when using model transfer files: When using a model transfer file (or, in the context of scenario management, a modification) that described the rerouting of a line route on which vehicle journeys had chained up vehicle journey sections, these passenger trip chains or forced chainings were lost. This error has been corrected. **(20972)**

## Visum Files

- ✔ Cancelling the import of global layout files: When importing global layout files and when resetting the window configuration, for each window with local data (e.g. schematic line diagram, matrix editor for an external matrix), the system asked whether this data should be saved. This dialog offered 'Cancel' as an option, although the process could not be aborted. This error has been corrected, i.e. 'Cancel' is no longer offered, and when importing global layout files, no further queries are asked, but the local data is discarded. **(20176)**
- ✔ Empty values for user-defined attributes with time interval subattribute in network files: If values for a user-defined attribute with a time interval subattribute were read in from a network file, where the first value read in was an empty value, the value of this user-defined attribute was set to the default value instead of the empty value. This applied to all objects up to the first one for which a non-empty value was specified for the attribute. This error has been fixed. **(20837)**

18.02-16 [149224]

2019-12-03

## ✔ Fixed Bugs

### COM-API, Procedure Sequence

- ✔ PrT assignment quality lists always empty in procedure sequence: If one of the PrT assignment quality lists was opened and read out via COM in a procedure step 'Run script' within the procedure sequence, its content was always empty. This error has been corrected. **(20715)**

### Data Model

- ✔ Negative values when converting a percentage time series to a matrix time series: When converting a percentage demand time series to a matrix time series, cells with negative values were lost. This bug has been fixed. **(20667)**

## Dialogs

- ✔ Crash when inserting skim procedure settings: No more crashes when inserting multiple values into the public transport skims table within the general procedure settings. **(20764)**
- ✔ Editing the line allocation for fare systems: In the dialog 'Edit PuT fares' the allocated lines of a fare system could not be edited if another separator than the comma was selected in the network settings for concatenated attributes or if a lot of lines were allocated. This bug has been fixed. Commas that occur in line names remain problematic. In this case, a separator must be selected in the network for concatenated attributes, which does not occur in any line name. **(20255)**
- ✔ Empty strings in the dialog 'Edit vehicle journey(s)': If the 'Edit vehicle journey(s)' dialog is opened for several vehicle journeys, it should display an asterisk for each attribute for which the vehicle journeys have different values. However, this did not work if one of the attribute values involved was empty. If the dialog was left in this situation via 'OK', the displayed value was taken over unintentionally for the vehicle journeys which previously had the empty value. This bug has been fixed. **(20657)**

## Graphics

- ✔ 'Text sizing factor screen' affects print: The 'Text sizing factor screen' in the graphic parameters of the network editor also took effect in the print preview and in print. This bug has been fixed. **(20402)**
- ✔ Color of the line bars changed when the decimal places were changed: When increasing the decimal places of a bar using the 'Edit bar' dialog, the graphic parameters of the first class of classified graphic parameters were also adopted for the uniform display, which could change colors and other settings. This bug has been fixed. **(20446)**
- ✔ Distance between bars in turn volume display: If the option 'Draw bars only on selected turns' is selected for the bars of a turn volume display, the option 'Distance between bars' did not affect the bars, i.e. the bars were drawn without a distance to the turn edge. This bug has been fixed. **(20400)**
- ✔ Text blocks of turn volumes in graphic parameters file: The information which text blocks are stored was no longer correctly written to or read from the graphic parameters for turn volumes at main turns. This error has been corrected. Turn volumes at turns were not affected. **(19853)**

## Graphics 3-D

- ✔ Incorrect progress display for prism display of POI categories: When recalculating a 3-D network view, which showed prisms for the POIs of a certain category, the number of all POIs was displayed as objects to be processed and not the number of POIs of the category. This bug has been fixed. **(18156)**

## I/O Interfaces

- ✔ Parameters dialog for railML import forgot settings: If you activated the option 'Import all vehicle journey sections as 'daily'' on the 'Calendar' tab of the parameters dialog for railML import and then switched to another tab and back again, the setting was lost. This bug has been fixed. **(20664)**
- ✔ Suppressing further messages in import of PuT supply from Visum: When importing a PuT supply from Visum, it was not possible to suppress further warnings in the case of warnings for non-importable lines. This bug has been fixed. **(19848)**
- ✔ railML-import fails in certain constellations: If a 'train' element in the railML data consists of several 'trainPart' elements of which one has more than one time values, but all except one are of type 'pass', then the section described by the following 'trainPart' element was also not imported. This bug has been fixed. **(19596)**

## Lists

- ✔ Display of time-varying attributes with subattributes: Values of time-varying attributes with subattributes could not be displayed or changed in lists. This bug has been fixed. **(18390)**
- ✔ Unstable sequence of selected objects: If several objects are selected consecutively in a list, the sequence of these objects in the global marking is unstable, i.e. cannot be reproduced. If the renumbering of objects is then called on such a marking, the sequence of the renumbered objects is also unstable. This error has been corrected. **(20741)**

## Miscellaneous

- ✔ Occasional crash when terminating Visum: A cause of occasional, non-reproducible crashes when exiting PTV Visum has been fixed. **(20671)**

## Network Editor

- ✔ Deleting intermediate link points on nodes: If a link has an intermediate point exactly on the From- or To-node, it could not be deleted or moved in the network editor. This bug has been fixed. **(20210)**

## Other Procedures

- ✔ Crash of tour planning without zones: The 'Tour planning' procedure no longer crashes if there are trip requests but no zones. **(20707)**
- ✔ Noise calculation in accordance with RLS-90: The noise calculation in accordance with RLS-90 was based on the average daily traffic volume instead of an hourly one. This error has been fixed. **(20636 🚫)**

## Procedure Sequence

- ✔ Questions and suppressed warnings: If warnings on the user interface were suppressed in the procedure sequence (or in comparable contexts, such as subnetwork generator or railML import) by the corresponding option, all questions with the same priority were not displayed, but the default answer was assumed. However, these questions were not listed in the message window. This bug has been fixed. **(20690)**

## PuT Line Blocking

- ✔ Vehicle interchange does not consider average capacity overload correctly: If volumes were taken into account in PuT line blocking with vehicle interchange and the average capacity overload was used as a criterion, this had too little effect. This error has been corrected. The calculation based on peak capacity overload was not affected. **(20725)**

## PuT Passenger Survey

- ✔ Attribute allocations to target attributes that do not exist in the network: If a procedure parameters file contained a 'Read survey data' procedure and attribute allocations to user-defined attributes of public transport paths that did not exist in the network, the allocation was not displayed on the 'Attributes' tab of the procedure parameters dialog. However, clicking the 'Create user-defined attributes' button did not allocate any new target attributes either for the source attributes concerned. This error has been fixed. **(20648)**

## Scenario Management, Visum Files

- ✔ Matrix data when renumbering (main) zones: If zones, main zones, or stop areas are renumbered in a network with matrices in such a way that their order is retained and this action is saved as a model transfer file, the matrix values of the affected zones are lost when this file is used. The same applies to a modification in scenario management. This error has been corrected. **(20625)**

## Timetable Editor

- ✔ Crash when editing several vehicle journeys: If the 'Edit vehicle journey(s)' dialog was opened for several vehicle journeys whose start and end time profile items differed, a crash could occur when assigning a new line, direction, or line route. This bug has been fixed. **(20406)**
- ✔ Rounding of attribute values when copying to clipboard: When copying vehicle journeys or marked sections of a line route to the clipboard, the attribute values of the vehicle journeys or the line route items and time profile items as well as of dependent objects that were also copied were rounded so far. When pasting this data, this either led to incorrect data or to queries regarding references to other network objects with attribute values that did not quite match. This bug has been fixed. **(20682)**

## Visum Files

- ✔ Reading a global layout with reserved characters in filter condition: If a character reserved in XML occurred in a filter condition (e.g. '<' or '>' for conditions to the public transport directions), a global layout file with such conditions could not be read in entirety. This error has been fixed. **(20525)**

## 🚫 Breaking Changes

## Other Procedures

- 🚫 Noise calculation in accordance with RLS-90: The noise calculation in accordance with RLS-90 was based on the average daily traffic volume instead of an hourly one. This error has been fixed. Noise calculation results change accordingly. **(20636 ✔)**

18.02-15 [147878]

2019-10-22

➕ New Features and Changes



## I/O interfaces

- ⊕ Parameters in SATURN input files: The SATURN import now accepts parameters spanning multiple lines in the SATURN data file **(20510)**

## Other Procedures

- ⊕ Display of credits for tour planning: The status of available credits for tour planning to be calculated in PTV MaaS Modeller can be viewed in the MaaS Modeller license dialog. If there are not enough credits available for tour planning, a clear error message is now issued when executing the procedure. **(20178)**

## ✓ Fixed Bugs

### Add-Ins

- ✓ Network objects without accidents in 'Generic Accident Model': In the add-in 'Generic Accident Model', network objects without accidents were previously not included in the model calculation. This bug has been fixed. **(20278)**

### COM-API

- ✓ Crash at ILink.InMainTurns or ILink.OutMainTurns: No more crash when calling one of the methods InMainTurns or OutMainTurns to output the inbound or outbound main turns of a link if the From- or To-node of the link is not assigned to a main node. **(20607)**
- ✓ Crash when terminating Visum: When terminating a Visum instance started via COM, a non-deterministic crash could occur if certain views in PTV Visum were open, e.g. a schematic line diagram. This bug has been fixed. **(20448)**
- ✓ Error messages were omitted during nested script execution: If a procedure sequence was executed in a script and another script was executed in it, and a certain exception occurred in this inner script, the text of this exception did not appear as message in Visum (i.e. in the message window or in files), but there was only a general message that the procedure step failed. This bug has been fixed. **(20515)**

### Data Model

- ✓ Access to legs very slowly in large networks: In large networks, access to the legs of nodes and main nodes was unnecessarily slow. As a result, operations such as deleting nodes or main nodes lasted too long, possibly triggered indirectly by importing network or model transfer files. This error has been fixed. **(20502)**
- ✓ Update of the attribute tCur\_PrTSys at connectors: The value of the attribute tCur\_PrTSys at connectors depends on the setting of the calculation method for connector shares of different attributes of the zones, the general procedure parameters as well as the demand itself. Previously, the values were not updated when changes were made to the relevant data. This error has been fixed. The values are still not updated when changing the demand description (selection of the relevant matrices) or the values of the matrices themselves. In PrT assignment, however, updated values are always used for calculation, so that non-updated values are only displayed in lists. **(20425)**

### Graphics

- ✓ Crash when drawing a network: No more crash when drawing a network, which contains a link whose To- and From-nodes have identical co-ordinates and that has no polygon points. **(20613)**
- ✓ Network does not draw if the file type is incorrect in the pfd file: If a file was specified in the configuration file AKTDRV.CFG for graphic parameters that did not contain a graphic parameters file and PTV Visum was started by double-clicking on a version file, the network was not drawn at all, i.e. the network window remained empty. This bug has been fixed. **(20000)**

### I/O Interfaces

- ✓ Floating-point numbers in railML export XML-compliant: Until now, the decimal separator specified in the user preferences of PTV Visum was used for floating-point numbers in railML export. In XML, however, only the point is allowed as decimal separator. The output is now in XML correct format, regardless of the user setting. **(20163)**
- ✓ HAFAS data in version 5.40 with 9-digit stop numbers: HAFAS data written in the format specified by version 5.40 but with 9-digit stop numbers could not be read. This bug has been fixed. **(20629)**
- ✓ Invalid link orientations after GTFS import: After executing a GTFS import, the From- and To-node orientations of some links were 'invalid'. This error has been fixed. **(20589)**
- ✓ Link type of blocked reverse links during shapefile import: During a directed import of links from a shapefile, the links not specified in the data, hence the blocked links, have been assigned to the same link type. This bug has been fixed, i.e. the blocked opposite links are now assigned to link type 0. **(20180)**

## Lists

- ✔ Crash when public transport path list is open and the OD pair filter is active: Crashes no longer occur when evaluating the OD pair filter if a public transport path list grouped by an attribute is open and the OD pair filter changes the number of rows (= groups). **(20322)**

## Main Window

- ✔ Sporadic crashes when opening lists: A crash could occur when repeatedly (very frequently) opening and closing lists or other views with tables (e.g. the matrix editor), for example due to repeated reading of version files with restoring of the windows contained in them. This bug has been fixed. **(20344)**

## Network Comparisons

- ✔ Attributes of objects from demand models irrelevant in version comparison: Attributes from a version comparison were incorrectly marked as irrelevant at various network objects from the demand model, and therefore some values were not output in the corresponding lists. This bug has been fixed. **(20471)**
- ✔ Exchange of main node cordon links via model transfer file: If a model transfer file contains both the removal of cordon links of a main node and the insertion of other links at the same main node, this network change could not be restored correctly in certain constellations when applying the model transfer file. This bug has been fixed. **(20554)**
- ✔ Major flows and node geometries in model transfer files: Certain changes to node geometries and major flows could not be applied when using a model transfer file. This error has been fixed. **(20587)**
- ✔ Merging or separating node legs via a model transfer file: If a model transfer file contains the merging of two links to a node leg or the splitting of a node leg consisting of two opposite one-way streets, this network change could not be performed correctly when applying the model transfer file. This bug has been fixed. **(20553)**
- ✔ Version comparison crash: No more crashes when loading a version file when creating or updating a version comparison in certain cases related to public transport paths. **(20473)**

## Network Editor

- ✔ Print area is not re-projected: When changing the projection in the network settings, the print area was not transformed up to now. This bug has been fixed. **(20311)**

## Other Procedures

- ✔ Matrix disaggregation in the procedure sequence: If the 'Matrix disaggregation' procedure was performed in a procedure sequence and it was not the first procedure in the procedure sequence, the output matrix could contain incorrect values. This bug has been fixed. **(20594)**

## PrT Assignment

- ✔ Aggregation of path trees in MPA too slow: The aggregation of path trees in PrT assignments with connector shares (MPA) was unnecessarily slow and has been accelerated. **(20506)**
- ✔ Procedure parameters not correct after switching the assignment procedure: If the procedure variant was switched to 'TRIBUT-Equilibrium assignment' or 'TRIBUT-Equilibrium\_Lohse' in a PrT assignment procedure step and assignment was then started without first opening the parameter dialog for this procedure, assignment could not be executed. This error has been corrected. **(20522)**

## PuT Line Blocking

- ✔ Crash in case of empty trips between bound vehicle journey sections at the end of a block: If there is a forced chaining where the arriving vehicle journey section ends at a different stop point than the departing vehicle journey section begins, a crash occurred during line blocking if the arriving vehicle journey section was served by the last line block item of a formed block. Otherwise the empty trip item was assigned to a wrong calendar day. Both bugs have been fixed. **(20266)**
- ✔ Transfer layover to depot not possible: In the line block display, it was not possible to transfer a layover to the depot if the display level at which the action was executed comprised more than one calendar day. This error has been fixed. **(20334)**

## PuT Passenger Survey

- ✔ Termination when building the search graph: Up to now, it was not possible to cancel the 'Read survey data' procedure at the beginning of the procedure during the construction of the public transport search graph for walk links, i.e. pressing the 'Cancel' button did not take effect until the construction of the search graph had been completed. This error has been fixed. **(20405)**

## Subnetwork Generator

- ✔ Generating a subnetwork not possible with certain dynamic data: The cutting of a subnetwork with dynamic results for PrT was only possible if the network was calculated with simulation-based dynamic assignment (SBA). If there were other dynamic results, e.g. from a route import, the cutting of a subnetwork failed so far. This error has been corrected by continuing to cut the subnetwork like in the static case, i.e. without a temporal resolution of the demand. **(20614)**
- ✔ If a user-defined formula attribute existed in the network whose formula referred to POI categories, creating subnetworks of this network failed. This bug has been fixed. **(20604)**
- ✔ Invalid major flows for main nodes that are transferred only partially to the subnetwork: If a main node was transferred only partially to the subnetwork when generating a subnetwork, so that individual inbound and outbound links were lost, the orientations of the legs of this node could change as a result. A major flow defined on this node could then become invalid. This error was fixed. **(20409)**

## Transfers Display of Regular Services

- ✔ Switching the interface language: If the language of the user interface was switched when the display of regular services was open, the input fields for From-time, To-time, basic cycle and tolerance were cleared. This bug has been fixed. **(19016)**

## Visum Files

- ✔ Endless loop when reading version files: When importing version files that contained main nodes, a situation could occur in which PTV Visum no longer responded and could only be terminated by the operating system (e.g. via task manager). This bug has been fixed. **(20563)**
- ✔ Messages in the context 'Read network' not in message window: Messages that were output in the context of reading a network file were no longer listed in the message window. This bug has been fixed. **(20565)**

## Visum Files, Scenario Management

- ✔ Signal coordination groups cannot be changed via model transfer file: Attributes of signal coordination groups could not be changed by applying a model transfer file. This bug has been fixed. **(20507)**

18.02-14 [146591]

2019-09-12

## + New Features and Changes

### COM-API

- + Irrelevant classes removed from COM-Reference. The COM-reference listed some classes which are not reachable through API functions. These irrelevant entries have been removed. **(20225)**

### Demand Procedures

- + Gaps from the Nested Demand model in protocol file: The Gap calculated by the procedure 'Nested Demand Gap Calculation' is now reported in the protocol file. Thereby, the progression of Gap values in iterative procedure sequences can be observed. **(20377)**

### IO Interfaces

- + Warnings for skipped data in VDV452-Import: The VDV452 import skips records with unmatching Base version number. When rows are skipped, this is now reported in the messages in order to indicate possible inconsistencies in the source data. **(20271)**

## ✔ Fixed Bugs

### ANM

- ✔ ANM export generates invalid ANM files: An ANM export with rounding of route volumes may result in invalid ANM files if the time intervals for balancing of the simulation-based assignment are different from the analysis time intervals. This error has been fixed. **(20470)**
- ✔ Crash during ANM export with rounded route volumes: No more crashes when exporting ANM with rounded route volumes if the network volumes are dynamic but the route volumes are not. **(20221)**

## Add-Ins

- ✔ Error when executing 'Reporting PrT Assignment': The Add-In 'Reporting PrT Assignment' does no longer produce an error when executed in a procedure sequence. **(20394)**

## COM-API

- ✔ No flow bundle conditions for main nodes: It was previously not possible to insert a flow bundle condition referring to a main node via CreateCondition. This bug has been fixed. **(20298)**

## Data Model

- ✔ Setting a route point fails: In certain constellations, setting a route point property for line route items was rejected due to a negative To-length. This bug has been fixed, i.e. negative values for the To-length never occur. **(20385)**
- ✔ User-defined data attributes for result data: Within Visum-20129 the creation of user-defined attributes for the network objects territories PuT detail and line route item PuT detail have been prevented. This change has been reverted. **(20445)**

## Demand Procedures

- ✔ EVA weighting slow in procedure sequence: Particularly in networks with many zones, the execution of the 'EVA weighting' procedure could become significantly slower if further memory-intensive procedure steps had already been executed beforehand. This error has been corrected. **(20389)**
- ✔ Incorrect results with destination binding across demand strata in tour-based model: If destination binding across demand strata was used in the 'Tour-based model - Combined trip distribution / mode choice' procedure, incorrect results were obtained if demand strata were not relevant for at least one output matrix. This error has been fixed. **(20346)**
- ✔ Invalid values in output matrices of 'EVA weighting': If in the EVA weighting procedure individual OD pairs are excluded from the calculation because one of the procedure parameters 'For active OD pairs only' or 'Exclude OD pairs connecting passive zones' is active and there is at least one passive zone, the output matrices of demand strata of OD type 3 could possibly contain arbitrary or even undefined values. This error has been fixed. **(20388)**
- ✔ Invalid values in the output matrices of the tour-based model: If the procedure 'Tour-based model - combined distribution/mode choice' was executed, invalid values (NaN, 'not a number', and similar) could occur in the output matrices if rubber banding was used for calculation. This bug has been fixed. **(20347 🚫)**

## Dialogs

- ✔ Identification of obsolete attributes in the graphic parameter dialog: In the graphic parameter dialogs, selected but non-existent attributes (e.g. user-defined attributes) are marked, but this was not the case for obsolete attributes. This error has been fixed. **(20493)**
- ✔ Queries in case of suppressed warnings: If Visum asks the user a question during an action for the duration of which warnings are suppressed, a message dialog indicates warnings that have occurred after the action has been completed and repeats the question even though it has already been answered (explicitly or implicitly). This bug has been fixed. **(19699)**

## Filters, Visum Files

- ✔ Reading invalid filter conditions: If a filter file or a global layout file for a filter contains a condition that refers to an attribute that does not exist in the network (e.g. a user-defined attribute), all settings for the filter in question have so far been ignored. Now only the affected condition is ignored and a warning indicates the problem that has occurred. **(19963)**

## Formulas

- ✔ Attribute selection: A double-click on an attribute in the formula editor when editing user-defined attributes or formula matrices opens the attribute selection dialog, but no longer automatically selects the selected attribute. This bug has been fixed. **(20435)**
- ✔ Crash when deleting multiple user-defined attributes used in formulas: A crash occurred when two user-defined attributes used in the same formula were deleted successively. This has been fixed. Currently, the second user-defined attribute can only be deleted after the formula has been adjusted after the first attribute has been deleted. This intermediate step will no longer be required when issue #20217 has been resolved. **(20202)**

## Graphics

- ✔ Crash when using obsolete attributes for display: If an attribute, which only existed in earlier program versions of PTV Visum (obsolete attribute), is set for the display of any network objects within an attribute selection, a crash occurred when drawing the corresponding layer. This bug has been fixed. **(20393)**

## I/O Interfaces

- ✔ Crash on ANM export of nodes with All-way Stop: No more crashes during ANM exports of networks in which there are main nodes with control type 'All-way Stop'. **(20398)**
- ✔ Handling of networks with a very different resolution in public transport updater: When importing a public transport supply from Visum ('public transport updater'), suboptimal courses of the line routes in the destination network occurred if the lengths of the individual links in the source network were larger by magnitudes than in the destination network, i.e. these networks resolved the same geographical area very differently. In order to deal with this case, a new parameter 'Threshold for the cost-probability' was introduced, the value of which should be increased in such constellations. **(19225)**
- ✔ No dwell times during VDV452 export: Dwell times were not exported during VDV452 export until now. This error has been fixed. **(19646)**
- ✔ Reuse of a node for split links in Shapefile import: If the highest imported From- or To-node number of a link is smaller than the largest number of existing nodes in the network during Shapefile import, sometimes no new node was created on the polygon course when splitting a link (e.g. because there is already a link between its nodes), but an existing node in the network was used as an intermediate node. This error has been fixed. **(20449)**

## Installation

- ✔ Crash when using .NET-Framework 4.6.2 on certain Operating Systems: Some Windows Operating Systems (e.g. Windows 10 Enterprise 2015 LTSC) support no .NET-Framework versions newer than 4.6.2. Some functions of Visum presumed a more modern version to be installed, which led to a crash. This has been fixed. **(20333)**

## Lists

- ✔ Attributes of the PrT path in a path on link level list: No values were displayed for attributes of the PrT path selected for display in the 'PrT paths on link level' list. This bug has been fixed. **(20300)**
- ✔ Crash when exporting the attribute list to the clipboard: No more crash when exporting the attribute list to the clipboard. **(20208)**
- ✔ Set numbers of POI to the same value: In the list of POI, the numbers of several objects can be set to the same value by marking several cells and entering a value. The POIs changed in this way will be lost the next time the version is opened after saving it. This error has been fixed. **(20504)**

## Passenger Survey

- ✔ Progress indicator: The procedure 'Read survey data' did not update the progress bar for parts of the operation. For larger datasets, this could suggest the operation stalled. This has been corrected. **(20231)**

## Procedure Sequence

- ✔ Slowdown during long procedure sequences: If, in a large network, many procedure steps were executed one after the other in a procedure sequence, the procedures executed later in the sequence became significantly slower compared to the runtime that resulted when the same procedure was executed with the same input data in a newly started Visum instance. This bug has been fixed. **(20399)**

## PuT Assignment

- ✔ Warning regarding vehicle journey items without capacity: In the case of capacity-restricted assignment, a warning is issued for vehicle journey items, which have no capacity because no vehicle journey section is defined for them. This check, however, also covered vehicle journey sections for which all vehicle journey sections were inactive, i.e. which were not taken into account in the assignment. In addition, gaps between vehicle journey sections on the same vehicle journey were not reported. Both errors have been corrected. **(20310)**

## PuT Operating Indicators

- ✔ Values of user-defined attributes of territory PuT detail objects swapped: If user-defined data attributes of the network object 'Territory PuT detail' existed and the network was written as a version file and later read in again, the values of these attributes were swapped between the individual objects. This error has been fixed. **(20391)**

## Scenario Management

- ✔ Messages when exporting or integrating a partial project: Messages that occur during the export or import of partial projects were previously not visible in the message window. This bug has been fixed. **(17907)**

## Timetable Editor

- ✔ Missing context menu entry: In the graphical timetable editor the context menu entry 'Edit vehicle journey in its course' was missing when selecting a vehicle journey. This bug has been fixed. **(20119)**
- ✔ Crash in line route editor when changing the line route: The program could crash in certain display configurations when changing line routes in the line route editor (explicitly or through synchronisation of selections) when the previously edited line route had multiple time profiles. This was fixed. **(20397)**

## Visum Files

- ✔ Read network file additively for connectors: The conflict handling 'Overwrite attributes' during additive reading of network files did not work for connectors, i.e. for connectors already existing in the network, the values of attributes not listed in the network file were reset to their defaults. This bug has been fixed. **(20304)**
- ✔ Reading networks: Main turns which were generated by a changed main node reference were ignored when reading network files. This bug has been fixed. **(20408)**
- ✔ Reading of version file fails if it contains the zone list: The import of a version file with the zone list contained in it and the restoration of the views no longer fails if the option 'Generate demand layout files when opening the zone list' is activated in the user settings. **(20474)**
- ✔ Writing English attribute files with a different interface language: If the language set for the user interface (i.e. in the license dialog) was one of the languages German, French, Italian or Polish, and if the language set in the user settings for network and attribute files was English, the table and column identifiers were output in English, but the attribute values for enumeration types were output in the language set for the user interface. Files created in this way cannot be read again in Visum. Writing to the clipboard or databases was also affected, but not to network files. This error has been corrected. **(20433)**

## ❗ Breaking Changes

### Demand Procedures

- ❗ Invalid values in the output matrices of the tour-based model: If the procedure 'Tour-based model - combined distribution/mode choice' was executed, invalid values (NaN, 'not a number', and similar) could occur in the output matrices if rubber banding was used for calculation. This bug has been fixed. Due to a changed execution order, there may be minor numerical deviations in the output matrices. **(20347)** ✔

18.02-13 [145112]

2019-08-01

## + New Features and Changes

### Demand Procedures

- + Less run time and memory consumption of 'Nested Demand': The run time and memory consumption of the 'Nested Demand' procedure was reduced, especially in the case of 'doubly-constrained'. **(20233)**

### Miscellaneous

- + The languages offered for the user interface are no longer controlled through the license. All available languages can be selected, independent of the license. The completeness of the translations cannot be guaranteed for all languages; thus, some elements might appear in the fallback language u'–'; usually English. Online help, manuals etc. are still provided in a subset of the supported languages. **(20137)**

### PrT Assignment

- + Acceleration Frank-Wolfe in large networks: The PrT equilibrium assignment Bi-conjugate Frank-Wolfe was accelerated especially in networks with a lot of zones. **(20257)**

### PuT Assignment

- + Holding areas in tour planning: In the 'Tour planning' procedure, selected nodes can now be used as preferred holding areas for MaaS vehicles. If this option is activated, these holding areas are frequented by the vehicles in phases of inactivity. **(19888)**

## ✔ Fixed Bugs

## Add-Ins

- ✔ Error message when starting the add-in 'Accessibility': No more error messages regarding missing graphics when starting the add-in 'Accessibility'. **(20226)**
- ✔ No zone centroids after TransCAD import: So far, the Add-in 'Import TransCAD Network' did not import zone centroids. This error has been fixed. The zone polygons are still not imported but can be added afterwards using shape files. **(20279)**

## COM-API, Other Procedures

- ✔ Unnecessarily slow network changes due to scripts in the procedure sequence: If a procedure step 'Run script' was executed in the procedure sequence, where the script code was not stored in the procedure parameters but externally as a file, the execution of the script code was unnecessarily slow if the script changed network objects. This problem did not occur with internally stored scripts, so they could be executed faster. This bug has been fixed. **(20236)**

## Data Model

- ✔ Crash when copying indirect attributes: No more crash when trying to duplicate an indirect attribute via the column header of a list and copying the values. **(20212)**
- ✔ Undefined behavior after changing the number of a PrT path set: Changing the number of a PrT path set via the list led from undefined behavior to program crashes during subsequent actions. This error has been fixed. **(20272)**

## Data Model, PuT Operating Indicators

- ✔ User-defined data attributes for result data: User-defined data attributes could be created for the network objects territories PuT detail and line route item PuT detail, whose objects are created and removed by executing procedures. This error has been fixed. Formula attributes are still permitted at these network objects. **(20129)**

## Dialogs

- ✔ PTV MaaS Modeller license dialog crashes: No more crashes in the license dialog for managing the PTV MaaS Modeller license when you need to renew an existing login, copy a token into the license dialog and click 'OK' instead of 'Finish'. **(20020)**

## Graphics

- ✔ Display problems with bars: Some display problems with bars at links with many polygon points have been fixed. **(18874)**
- ✔ Drawing of very complex links accelerated: The drawing of very complex links, i.e. those with many intermediate points, was unnecessarily slow and has been accelerated. **(20191)**
- ✔ Incorrect bar widths in network view exports: If a different scale than the scale currently used in the network was set when exporting the network view to files (screenshot, SVG export), the bars were exported with an incorrect width. This bug has been fixed. **(20161)**

## I/O Interfaces

- ✔ Coordinates in VDV452 export wrong: If, in the user preferences, the comma was set for the format of decimal numbers, -2147483648 was always output as value in the file 'rec\_ort' for coordinates in the VDV452 export. This bug has been fixed. **(20260)**
- ✔ Crash when reading the railML import parameter file: No more crash when importing a railML parameter file written with PTV Visum 2020 (\*\*.puti\*). **(20258)**
- ✔ Missing interpolated time stamps in GPX imports: During GPX import, all interpolated time stamps were zero if the time stamps specified in the GPX track had decimal places. This bug has been fixed. **(20207)**
- ✔ Parallel links in shapefile import: Under certain circumstances, parallel links were not correctly split during shapefile import. This bug has been fixed. **(20073)**
- ✔ Too many intermediate points in VDV542 export: If the same stop-stop relation occurred several times within a time profile, too many intermediate points were exported in VDV452 export. When reading this file again, an unwanted zigzag routing occurred. This error has been corrected. **(20264)**
- ✔ Turn closed after Emme import: After importing an Emme network all turns were closed for all transport systems. This error has been fixed. **(20012)**

## Installation

- ✔ Crash with wrong license data: No more crash at program start if the license contains a network size unknown to the program. **(20181)**

## Lists

- ✔ Crash when exporting a list without columns: No more crashes when exporting a list without columns with the setting 'like list'. **(20235)**

## Matrix Editor

- ✔ Crash when deleting an open matrix: No crash anymore when a matrix is deleted which is open in the matrix editor. **(20209)**

## Other Procedures

- ✔ Start day and start time in the demand description for the generation of trip requests: In the procedure 'Generate trip requests' the start day and start time in the demand description of the corresponding demand segment were not taken into account when determining the start time of the time series. This error has been fixed. **(20179)**

## PuT Assignment

- ✔ Preselection in the iterative variants of the timetable-based assignment: If a second search is carried out in a capacity-restricted timetable-based assignment or in a timetable-based assignment with Sharing transport systems and if there are two equivalent connections for an OD pair from the first search, but none at all from the second search, many paths are unjustifiably omitted in the preselection of the second search. This error has been fixed. **(20317 🚫)**
- ✔ Warning for skimi matrix when using the dispatcher in tour planning: When using the dispatcher in tour planning, entries with the value 0 were warned in the skim matrix, although the skim matrix is irrelevant in this case. This error has been corrected. **(20275)**

## PuT Line Blocking

- ✔ Generating system routes unnecessarily slow: If the generation of the system routes needed for empty trips was required for line blocking, line blocking in large networks became unnecessarily slow - especially slower than the previously executed generation of all system routes between relevant stop points with subsequent line blocking based on it. This error has been fixed. **(20023)**

## Subnetwork Generator

- ✔ SC for main node: If there was a signal control in the network that controlled a main node that was not contained in the subnetwork, incomprehensible error messages occurred. This error has been corrected. **(20245)**

## Timetable Editor

- ✔ Fixed arrival or departure times for 'Edit vehicle journey in its course': As part of the 'Edit vehicle journey in its course' operation, the first departure time was always fixed, regardless of an existing fixation of arrival or departure time. After manually fixing another time, this fixation did not take effect when editing the first departure time of a vehicle journey. Both bugs have been fixed. **(19974)**

## Timetable Editor, Visum Files

- ✔ Load global layout with line block editor: No more crashes when loading a global layout file if it contains a line block editor and a line block editor was already open before. **(20239)**

## Transfers Display of Regular Services

- ✔ Bar position in mode 'Only draw bars between marked service groups': The transfers display of regular services also considered the width of bars inside which were not drawn when in mode 'Only draw bars between marked service groups'. As a consequence the allocation to the corresponding service group was no longer visually given. This error has been fixed. **(20138)**

## 🚫 Breaking Changes

### PuT Assignment

- 🚫 Preselection in the iterative variants of the timetable-based assignment: If a second search is carried out in a capacity-restricted timetable-based assignment or in a timetable-based assignment with Sharing transport systems and if there are two equivalent connections for an OD pair from the first search, but none at all from the second search, many paths are unjustifiably omitted in the preselection of the second search. This error has been fixed. As a result, the result of the timetable-based assignment changes significantly in affected cases. **(20317 ✔)**



## + New Features and Changes

### Formulas, Demand Procedures

- + Acceleration of the evaluation of matrix formulas: The evaluation of matrix formulas was accelerated, especially for large networks. This also has a positive effect on the duration of the 'Tour-based model - Combined trip distribution / mode choice' procedure. **(17602)**

### Lists

- + Improved usability for color schemes: The usability of the settings for color schemes in lists has been improved. In particular, the dialog for the operation 'Specify color scheme for all columns...' is already initialized with the existing classification if the columns already have a uniform classification. **(17179)**

### Lists, Matrix Editor, Procedure Sequence

- + Horizontal scrolling with direct movement: Previously, when scrolling vertically in longer lists, the view was moved directly so that new rows were added to the visible area, whereas when scrolling horizontally, the view was not updated until the mouse was released. This behavior has now been changed so that the visible area is immediately adjusted in both directions. This makes it easier, for example, to find the desired column in a list with many columns. This new behavior works in all list-like views, for example in the procedure sequence window and in the matrix editor. **(20139)**

## ✓ Fixed Bugs

### ANM

- ✓ No DrivingBehavior for link types > 99: For link types with numbers greater than 100, the mandatory attribute DrivingBehavior was not written during ANM export. Such files were subsequently not readable in PTV Vissim. This error has been fixed. **(20164)**
- ✓ Times in ANM export from network with calendar: When exporting ANM routes from a network with calendar, the times were taken into account, but not the calendar day. This error has been fixed. Since the ANM data model does not provide a daily reference, the routes of a specific day can now be exported, but not those for several calendar days. **(20123)**

### Add-Ins

- ✓ OMX import or export fails: OMX import or export for multiple matrices selected by their properties failed. This bug has been fixed. **(20165)**

### COM-API

- ✓ No error calling OpenLayout with an incorrect file name: Calling the 'OpenLayout' method at a list object ('I...List') and specifying a file name as an argument for which no file existed in the file system did not lead to a COM error. This bug has been fixed. **(20194)**

### Data Model

- ✓ Adjustment of the analysis period when switching the calendar: When switching the calendar from a weekly calendar to no calendar, a multi-day analysis period was not adjusted. As a result, procedures (e.g. 'PuT Operating Indicators') could no longer be carried out. This error has been fixed. **(20124)**
- ✓ Calculation of matrix column minimum / maximum too slow: The evaluation of the attributes matrix column minimum and matrix column maximum at the zone was too slow and has been accelerated. **(20205)**

### Dialogs

- ✓ Access to Online Help from graphic parameters for point objects: Access to the context-sensitive help (F1 key) from the graphic parameters dialogs for point objects (nodes, zones, link labels, ...) always led to the start page of the help. This bug has been fixed. **(20022)**

### Filters

- ✔ Condition on node geometry-dependent attributes when importing a filter file: If a filter file was imported in which a condition was set for an attribute whose value depended on objects of the node geometry (e.g. by accessing a lane turn via a relation), this condition was not evaluated correctly. This bug has been fixed. **(19931)**

## Graphics

- ✔ Drawing the network interrupted at lane allocation: If the lane allocation layer was active in the graphic parameters, it could happen that the network first became invisible after inserting a network object. This bug has been fixed. **(19969)**

## I/O Interfaces

- ✔ Offset for POI numbers when importing shapefiles: The offset was not handled correctly when importing a shapefile additively and inserting the new objects as POIs. This bug has been fixed. **(20227)**

## Lists

- ✔ Crash in column filter for empty attributes of an enumeration type: If an attribute of a non-program defined enumeration type was displayed in a column of a list and an empty value was permitted for this attribute (e.g. the vehicle combination number of a line), a crash occurred when displaying the tooltip for the set column filter when the empty value was selected as a condition. In addition, filtering for such an empty value did not produce the correct result. Both errors have been fixed. **(20108)**
- ✔ Empty values in column filters: In the column filters of a list, numeric empty values did not work like 0 and empty values in character strings did not work like the empty character string. This bug was fixed, so that column filters now behave analogous to normal filters on single attributes. **(19040)**

## Miscellaneous

- ✔ Delay at program start in case of bad internet connection: If the start page was difficult to reach or not accessible at all, there were delays when starting the program. This bug has been fixed. **(20084)**
- ✔ Incorrect Windows version in support form: If the support form was opened on a computer with Windows 10 via the menu entry 'Technical support' in the 'Help' menu, the field for the Windows version was incorrectly pre-populated with 'Windows 8'. This bug has been fixed. **(20198)**
- ✔ Language of Online Help: The change of the user interface language had no effect on the Online Help until PTV Visum was restarted. This bug has been fixed. **(19846)**

## Network Editor

- ✔ Crash during fuzzy surface alignment: No more crashes during fuzzy surface alignment (triggered as explicit operation 'Fuzzy surface alignment...' for polygonal network objects or indirectly via import functions), if objects are deleted from the surface model in the process. **(20037)**
- ✔ Crash when changing link orientations: No crash anymore when changing the link orientations (from/to-node-orientation, from/to-main node-orientation) in certain cases. **(20057)**

## PuT Assignment

- ✔ Crash when writing the connection file: No more crashes when executing the timetable-based PuT assignment with connection export, if an exceptional situation occurs when closing the connection file (e.g. network drive no longer accessible). **(19532)**
- ✔ Sharing crash in connection with multiple demand segments: No more crashes when performing a timetable-based assignment with Sharing transport systems when multiple demand segments are assigned together and volumes are saved together for only one of the demand segments. **(20140)**

## PuT Operating Indicators

- ✔ Protection against multi-day AP without calendar: Due to errors in earlier program versions, there may be networks in which a multi-day analysis period is set although there is no calendar. In these cases, the 'PuT Operating Indicators' procedure was terminated with an unspecific error message. This error has been fixed. **(20125)**

## Timetable Editor

- ✔ Crash when changing the line route in the line route editor: If a line route with several time profiles is displayed in the line route editor and all lines (i.e. time profile items) of the table are marked on the 'Multiple' tab on the right side of the editor, Visum could crash under certain circumstances if (directly or indirectly via the reference object synchronization) another line route was selected. This bug has been fixed. **(20105)**

## Visum Files

- ✔ Reading of version files with analysis time intervals outside the calendar: In earlier program versions, version files could be created in which there were analysis time intervals outside the calendar. In such cases, the calendar was switched to an annual calendar. Data, e.g. passenger trip chains, can be lost in the process. If the analysis time intervals are outside the analysis period, but still within the calendar, only the analysis period is adjusted without changing the calendar, so that all input data is retained. **(20128)**

18.02-11 [143310]

2019-05-24

## + New Features and Changes

### Data Model

- + Relation of PuT paths to all path legs including walk legs: The previous relation from PuT paths to their PuT path legs only lists path legs with transport, i.e. no path legs covered with PuT-Walk transport systems. For this purpose a new relation 'PuT path legs including walk legs' was created, which lists all PuT path legs. The previous relation has been renamed to 'PuT path legs excluding walk legs' for clarification (with the short name remaining for PTV Visum 18). **(19919)**

### Other Procedures

- + Tour planning (DRT / MaaS): The 'Tour planning' procedure now uses the dispatcher algorithm by default. **(20070)**
- + Tour planning without skim matrices for PrT-DSEg: The 'Tour planning' procedure can now also be executed without skim matrices of the journey time and journey distance being available for the PrT demand segment selected for the vehicle fleet if the dispatcher algorithm is used. Export to PTV MaaS Modeller is also possible in this case. **(19928)**

## ✔ Fixed Bugs

### Add-Ins

- ✔ Error when starting 'EVA Auswertung': An error message occurred when starting the add-In 'EVA Auswertung'. This bug has been fixed. **(19172)**
- ✔ Projection in 'StreetLight OD Import': The Add-In 'StreetLight OD Import' could be executed, although the projection set in the network was not the correct projection 'WGS 1984', but another projection with the same name. This bug has been fixed. **(19301)**
- ✔ Reference to error messages for 'StreetLight OD Import': If errors occur during the execution of the add-in 'StreetLight OD Import', the Visum message window is now referenced explicitly. In this window, further information has already been output in the event of an error. **(19721)**

### COM-API

- ✔ Recursively executing a procedure sequence not forbidden: Previously, in a script that was executed in a 'Run script' step in the procedure sequence, the execution of the procedure sequence could be started via Visum.Procedures.Execute, which could lead to an infinite recursion. This error has been corrected, i.e. the execution of procedures via COM is rejected if the COM method itself is called from a procedure step. **(19942)**

### Demand Procedures

- ✔ Incorrect path sequences from tour-based model tours: When creating path sequences from tour-based model tours, the transfer probabilities of the origin zone of the entire tour were incorrectly used for all transfers within a tour instead of the transfer probabilities from the previous zone. From activity chains of length 3 (e.g. H-W-S-H) this led to incorrect results for the activity transfers towards the end. This error has been corrected. **(20113)**

### Dialogs

- ✔ Parameters are missing in the 'Read shapefile' dialog: In the 'Read shapefile' dialog the settings for fuzzy alignment of surfaces were no longer displayed. This bug has been fixed. **(20075)**

### Filters

- ✔ Adaptation to renamed relations when reading a filter file: When reading a filter file with a filter condition that contained a relation that had been renamed in the meantime, this former relation ID was not changed to the current ID, even if the relation between old and new ID was known. This bug has been fixed. **(20112)**

## Formulas

- ✔ Properties of formula attributes are lost when network changes occur: When adapting formulas (in user-defined formula attributes and procedure variables) to changes in the network, e.g. to the renaming of a network object that exists as a subattribute, the affected user-defined attributes lost certain properties such as the property to carry subattributes. This error has been fixed. **(20095)**

## Graphical Procedures

- ✔ Flow bundle volumes at sharing stations wrong: In all flow bundle volume attributes (alightings, boardings, origin boardings, passenger transfers, and destination alightings) at sharing stations, the sum of the values for AH and AP has been output for AH so far. This error has been fixed. **(20045)**

## Graphics

- ✔ Bar connections with angles > 180 degrees: With angles larger than 180 degrees between two links, the option 'Connect bar polygons' caused display errors of the bars. This bug has been fixed. **(20068)**
- ✔ Empty values for classified displays: In classified displays, objects with an empty value set for the selected attribute were always sorted into the first class. This bug has been fixed, i.e. for numeric values, objects with an empty value are sorted into the class containing the 0 again, and for character strings into the class containing the empty string. **(20087)**

## I/O Interfaces

- ✔ Crash on DXF export of network view: Crashes no longer occur during a DXF export of the network view in networks with no background map. **(20032)**
- ✔ GPX import changes surfaces: The execution of a GPX import changed the surfaces already existing in the target network, more precisely these were normalized and commonly used points were merged in the data model. This error has been fixed. **(19870)**

## Lists

- ✔ Attribute filter for analysis time interval preselection defective: If a preselection of an analysis time interval (or AP/AH) was made in the attribute filter of an attribute selection (e.g. for a list), this preselection was no longer effective in the next opened attribute selection. This error has been corrected. **(19683)**
- ✔ Program not usable during evaluation of column filters: If a column filter was activated in a list or its condition was changed, PTV Visum could no longer be operated during the immediately following evaluation of the filter condition. In particular, the desired filter condition could not be entered completely if it consisted of several keystrokes. This behavior has been improved. **(19859)**

## Miscellaneous

- ✔ Crash with Xeon W CPU under Windows 7 or Windows Server 2012: No crash anymore when starting PTV Visum on computers with Xeon W CPU under Windows 7 or Windows Server 2012. **(18440)**
- ✔ Online help can also be called if there is an indirect Internet connection: If the online help cannot be called due to a missing Internet connection, it is now possible to open the URL anyway upon request. This allows the user to enter any access data required for Internet access via proxy. **(20117)**

## Network Comparisons

- ✔ Filters for PuT paths are not transferred during version comparison: Previously, filters for PuT paths were not transferred to the network loaded in the background during a version comparison with a network loaded in the background. This error has been corrected. Since no paths were loaded from the background network during version comparison (so far), the filtered volumes in the background network are now always 0 (previously they corresponded to the unfiltered volumes) when comparing volumes. In PTV Visum 2020 it is possible to load the paths from the background network, only then the comparisons of filtered volumes are correct. **(19978)**

## PrT Assignment

- ✔ Congestion starts for no reason in case of blocking-back calculation: If the calculation of congestion according to the blocking-back model was activated, congestion could occur in the network without reason if transport systems with passenger car units other than 1 were involved. This error has been fixed. **(20090 🚫)**
- ✔ Crash in TRIBUT for relation-based VoT with MPA: No more crash when executing the TRIBUT-Equilibrium or TRIBUT-Equilibrium\_Lohse procedure if the distribution of the Value of Time is OD pair-dependent and connector shares per OD pair (MPA) are used. **(19522)**

## PuT Assignment

- ✔ Incorrect Sharing volumes for last time slice: If the end of the last Sharing time slice fell on the end of the analysis period, then the relocations for this time slice were not recorded correctly. This error has been fixed. **(20099)**

## PuT Line Blocking

- ✔ Crash during line blocking with vehicle interchange and forced chainings: No more crashes when performing line blocking with vehicle interchange if there are forced chainings, at which several vehicle combinations are permitted in the first vehicle journey section, but only one in the bound second vehicle journey section. **(20042)**
- ✔ Crash when opening version files with line block editor: No crash anymore when opening a version file in which a line block editor is open, if the opened views are restored (user setting) and a line block editor was already open before. **(20018)**

## PuT Operating Indicators

- ✔ Passenger trip chain times missing at service times of vehicle journey item: The indicators service time and section service time at vehicle journey items did not take into account any passenger trip chain times. This error has been fixed. **(20014)**

## Safety

- ✔ Handling of user-defined attributes: When Visum Safety is started for the first time, some user-defined attributes are created. If, however, attributes with the same name already existed in the network, errors occurred, some of which were not output as messages. This error has been corrected, i.e. Visum Safety can now handle this case. **(19829)**

## Scenario Management, Visum Files

- ✔ 'Reversing' a one-way road via model transfer file or modification: In the base network a link is open in one direction, in the other direction it is closed. If the direction is reversed in a model transfer file or in a modification within the scenario management, i.e. the opened direction of the link is closed and the other direction is opened, this results in error messages during import and subsequently in invalid node geometries at the two neighboring nodes of the affected link. This error has been fixed. **(19894)**

## Subnetwork Generator

- ✔ Demand which, in the case of SBA assignment, is only introduced into the network in the extension time interval: If there is demand for an SBA assignment that does not enter the subnetwork until the extension time interval, it was previously entered in the matrix of the last demand time interval of the matrix time series in the cut subnetwork. This error was corrected by extending the matrix time series in this case by a further time interval of 1h duration, in the matrix of which the demand not entered into the network is entered. **(19785)**

## Timetable Editor

- ✔ Crash on certain aggregated displays: No more crashes in the aggregated display (e.g. according to service trip patterns) of the tabular timetable if a permitted aggregation function is not set in the layout for each selected attribute. **(20038)**

## Visum Files

- ✔ Crash when cancelling the reading of a version file: No more crashes when cancelling the import of version files. **(20094)**
- ✔ Crash with attribute files with non-existent subattributes: No more crashes when importing an attribute file containing an editable attribute with invalid subattribute ID. **(20106)**
- ✔ Import of procedure parameters without matching POI category: No more crash when importing a procedure parameter file if it contains a procedure step 'Edit attribute' for which an attribute of a POI category that does not exist in the network is to be changed. **(20098)**
- ✔ Planned connecting journeys without connection probability in the network file: If you import a network file with planned connecting journeys and the (input) attribute 'Reached connecting journey probability' is not specified (there is no column with this name), the resulting planned connecting journeys have the value 0.0 instead of the empty value for the probability of a connection. This error has been fixed. **(19958)**

## ❗ Breaking Changes

## PrT Assignment

- ❗ Congestion starts for no reason in case of blocking-back calculation: If the calculation of congestion according to the blocking-back model was activated, congestion could occur in the network without reason if transport systems with passenger car units other than 1 were involved. This error has been fixed. This changes the assignment results of PrT assignments with the blocking-back model switched on as well as the results of assignment with ICA. (20090 🟢)

18.02-10 [142217]

2019-04-25

## 🟢 Fixed Bugs

### Data Model

- 🟢 Missed connecting journeys at wait time 0: If the maximum negative wait time for missed connecting journeys in the network is set to 0min, all pairs of vehicle journey items at the stop were shown as missed connecting journeys instead of none. This error has been corrected. (19956)

### Dialogs

- 🟢 Calling the help from the graphic parameters dialog: From the 'Display' page of most graphic parameters dialogs, a wrong help page was called as context-sensitive help with the F1 function key. This error has been corrected. (19961)
- 🟢 Crash when changing the border color of the legend: No more crashes when changing the border color of the legend. (20004)
- 🟢 Layout of the dialog 'Read shapefile': In the 'Read shapefile' parameters dialog of the shapefile import, the controls were not positioned correctly. In particular, not all necessary controls were always visible. This bug has been fixed. (19875)
- 🟢 License dialog in different languages: In languages that run relatively 'long' (e.g. French or Russian), not all information was visible in the license dialog and not all buttons were available. This bug has been fixed. (19844)

### Lists

- 🟢 Number field and numbering column larger: The left column in lists with the row numbers, especially the field at the top left with the number of all list rows, has been enlarged in lists that can potentially become very long, so that the number is completely visible. (18469)
- 🟢 Version files with lists of planned connecting journeys: No more crashes when opening a version file with views recovery if a list of planned connecting journeys is open in the version file and this list was also open before starting to read the version file. (19944)

### Matrix Editor

- 🟢 Calculation of the shares in the histogram slow: The calculation of the interval shares in the matrix histogram was very slow for large matrices (especially formula matrices) and has been accelerated. (19979)

### Network Editor

- 🟢 Marking of stop-stop sections too long: When marking stop-stop sections of time profiles (e.g. time profile items, but also connecting journeys or planned connecting journeys), the course of the line route from the end time profile item to the following line route item was also highlighted in the network editor. This bug has been fixed. (18828)

### Other Procedures

- 🟢 Crash triggered by 'Convert paths': The 'Convert paths' procedure no longer crashes if paths are converted from one path set to another path set and 'Overwrite' is set as conflict handling option. (19971)

### PrT Assignment

- 🟢 Assignment with ICA with Bi-conjugate Frank-Wolfe as internal assignment incorrect: In the ICA assignment, when using the Bi-conjugate Frank-Wolfe assignment as internal assignment, the ICA calculation was not calculated based on the correct data from the assignment. As a result, the assignment with ICA may not have converged. This error has been fixed. (19872 ❗)
- 🟢 Use of link types in case of fewer or more than 100 link types: The use of fewer or more than 100 link types or numbering them differently than 0-99 in the network led to an undefined behavior in the dynamic equilibrium assignment DUE, i.e. it could crash but also run through and produce incorrect results. This error has been corrected. (19897)

## PuT Line Blocking

- ✔ Infinite loop for line blocking with vehicle exchange and open line blocks: If there are vehicle journeys in the network that start after 24h on the last day of the line blocking time interval, the line blocking with vehicle exchange ended in an infinite loop if the creation of open line blocks was required. This bug has been fixed. **(20008)**
- ✔ Time faults during a depot stay: If a transition from one vehicle journey to a subsequent vehicle journey takes place in a line block without an intermediate time at a stop that is also a depot (i.e. the arrival of one vehicle journey is the departure of the other, taking into account preparation and post-processing times, the end time of the post-processing time is the start time of the preparation time), an incorrectly inserted depot stay of 1 second could lead to a time fault in the line block. This error has been fixed. **(19922)**

## PuT Operating Indicators

- ✔ No number of vehicles at transport systems: The values of the attributes 'Number of vehicles (length-proportional)' and 'Number of vehicles (time-proportional)' were not issued at the transport system, i.e. the values were always 0. This error was corrected. **(20019)**
- ✔ Number of vehicles at vehicle journeys not for analysis time intervals: The values of the attribute 'Number of vehicles' at vehicle journeys were not shown for analysis time intervals. This bug has been fixed. **(19960)**

## Scenario Management

- ✔ Calculation of scenarios in the student version: In the student version of PTV Visum no scenarios could be calculated via the calculation server. This error has been fixed. **(19943)**

## ❗ Breaking Changes

### PrT Assignment

- ❗ Assignment with ICA with Bi-conjugate Frank-Wolfe as internal assignment incorrect: In the ICA assignment, when using the Bi-conjugate Frank-Wolfe assignment as internal assignment, the ICA calculation was not calculated based on the correct data from the assignment. As a result, the assignment with ICA may not have converged. This error has been fixed. This changes the results of the assignment with ICA when Frank-Wolfe is used as internal assignment. **(19872)** ✔

18.02-09 [141639]

2019-04-08

## + New Features and Changes

### Lists

- + Copy column as user-defined attribute: It is now possible to copy the contents of a column in a list to a user-defined attribute using an entry in the shortcut menu of the header of a column. In detail, this means that a user-defined attribute of the appropriate type is created for the same network object, the values of the selected column are copied there, and the new attribute is displayed as a column in the list. **(16813)**

### Network Editor

- + SSL/TLS encryption for WMS services for background maps: SSL/TLS encryption is now supported when integrating WMS services for displaying background maps. **(19504)**

## ✔ Fixed Bugs

### Add-Ins

- ✔ 'Create Regular Timetable' fails in case of empty vehicle combination number in time profile: If no vehicle combination number is specified in a time profile, the add-in 'Create Regular Timetable' failed during execution, instead of not allocating a vehicle combination to all vehicle journey sections either. This bug has been fixed. **(19962)**
- ✔ Exceptions instead of error messages: When executing the add-in 'Buffers Around PuT Lines', exceptions could occur in certain cases in the geometry calculation. The calculation then failed instead of issuing an error message for the line route concerned and continuing the calculation for further line routes. This error has been fixed. **(19856)**

## COM-API

- ✔ PrintNetEditor2D does not work for paper size A1: The IGraphic::PrintNetEditor2D method did not work correctly for paper size A1, i.e. if the value 'A1' was specified for the optional paper size parameter, the printout was still done on A4 paper. This bug has been fixed. **(19855)**

## Data Model

- ✔ Adjustment of relations after changing the code of a demand segment: When changing the code of a demand segment, the relation ID of relations with the demand segment code in the name (e.g. 'Fare system (<DSegCode>)' or 'Ticket type (<DSegCode>)' at the PuT path leg) was not adjusted. As a result, the system crashed when the demand segment was deleted later. This bug has been fixed. **(19806)**
- ✔ Duplicating uncalculated attributes: Copying an attribute (definition and values) via the attribute list or via the column header of a list column did not work if the attribute was an uncalculated output attribute. This bug has been fixed. **(19861)**
- ✔ Relations cannot be hidden by add-ons: Unlike attributes, relations could not be hidden from the attribute selection tree by switching off add-ons to which they belong. This bug has been fixed. **(19926)**
- ✔ Sequence of the links of a screenline undefined: The order in which the links cut by a screenline were listed in the three relations from screenline to links was not deterministic until now, and could therefore be different in each Visum session. This error has been corrected. The enumeration is now sorted by the (first) intersection in the direction of the screenline. **(19661)**

## Dialogs

- ✔ Copy and paste in dialog 'Comparison of run times and dwell times': In the dialog 'Comparison of run times and dwell times' the new values for run or dwell times were displayed on the interface after being copied and then pasted into cells, but were not transferred to the data model. This bug has been fixed. **(18370)**
- ✔ Crash when deleting a choice model structure with nested demand: A crash no longer occurs when deleting the last choice model structure in the parameter dialog of the 'Nested demand' procedure. **(19807)**
- ✔ Marking objects allocated to a POI in the network editor takes a long time: If many network objects are allocated to a POI and complex graphic parameters are also set for them, opening the allocation dialog took a long time due to the resulting drawing of the markings. Therefore, the allocated objects are now only drawn if their number does not exceed a certain limit, analogous to the marking in lists. If the markings are not drawn because the number of objects is too large, a short message will be issued. **(19473)**
- ✔ User preferences for lines not completely visible: In the dialog 'User preferences' not all controls were visible under Network / Lines. This bug has been fixed. **(19866)**
- ✔ Warning when changing the size of legend fonts: When editing the size of fonts in the legend, an irritating message used to be displayed that a blank value is not allowed as an input, even before the input has been completed. This bug has been fixed. **(19742)**

## Formulas

- ✔ Crash when using a matrix function with an unsuitable network object reference: A crash no longer occurs when using a matrix formula function that returns a matrix with a different network object reference than expected in the context of this formula. Example: The matrix formula function FLOWBUNDLEMATRIX("DSeg") always returns a zone matrix. If this was used in a formula for a main zone or stop area formula matrix, the evaluation crashed. **(19570)**

## Graphical Procedures

- ✔ No highlighting of the reference objects for flow bundle, isochrones and shortest path search: When defining the reference objects for flow bundle conditions, isochrones or shortest path searches, the network objects located under the mouse pointer were not highlighted in the network editor. This bug has been fixed. **(18554)**

## Graphics

- ✔ Redraw after filter changes: If attributes were used in the graphic parameters that depended on the active status of network objects, e.g. if a 'SumActive' relation was used, the network was not redrawn after filter changes. This bug has been fixed. **(19744)**
- ✔ User-defined drawing order does not work with empty values: If the drawing order for a network object type is set to attribute values and an attribute with empty values is used, the objects with empty values are always drawn in the foreground. The setting for largest and smallest values in the foreground only affected those objects that did not have an empty value. This bug has been fixed. **(19773)**

## I/O Interfaces

- ✔ No interpolated travel times at the beginning of a GPX track: When importing GPX, no interpolated travel times were shown on the resulting PrT path for the section from the beginning of the path to the next found input point. This bug has been fixed. **(19903)**



- ✔ Source network in folder other than target network for import of 'PuT supply from Visum': If the source network for the import of a public transport supply from Visum ('PuT updater') was in a folder other than the target network and relative paths were specified, the import could not be executed. This error has been fixed. **(19851)**

## Lists

- ✔ Crash when canceling the calculation of aggregation classes: No more crashes when canceling a long-running calculation of the aggregation classes of a grouped list. **(19836)**
- ✔ Multi-edit of numeric list cells: When multi-editing list cells that display numeric attributes, the action was completely rejected if the change was forbidden for at least one object due to violation of the permitted value ranges. This error has been corrected. **(18558)**

## Main Window

- ✔ Crash if registry window configuration is incorrect: No more crash when starting PTV Visum if the registry window configuration is incorrect. Such a faulty window configuration is now detected and not restored, so that PTV Visum then starts with the default window configuration. **(19874)**
- ✔ Crash on Undo after inserting a line route: 'Undo' no longer leads to a crash if you inserted a line route and the line route editor is open, in which a line route item is marked. **(19889)**

## Matrix Editor

- ✔ Crash in the matrix histogram when reducing the number of matrices: No more crash when loading a layout for the matrix histogram if fewer matrices are provided for display in this layout than in the previous state of the histogram. **(19911)**

## PrT Assignment

- ✔ Factor before tCur in the impedance function can cancel closure: If a coefficient smaller than 1 is specified in the impedance definition for the travel time in the loaded network tCur, closed links (e.g. with an empty transport system set) in the assignment variants (classic) 'Equilibrium assignment', 'Equilibrium assignment LUCE', or 'Equilibrium assignment Bi-conjugate Frank-Wolfe' could still be used under certain circumstances, but in practice only with extremely small pre-factors. This error has been fixed. **(19873 🚫)**
- ✔ SBA version files could not be opened: In certain cases, version files containing a whole day assignment with extension calculated with SBA could no longer be read in since the last service pack PTV Visum 18.02-08. This error has been corrected. **(19933)**
- ✔ Turns with capacity 0 in assignment with ICA and LUCE: In the Equilibrium assignment LUCE turns with a capacity of 0 were previously always considered closed. However, this criterion does not necessarily apply to ICA assignment. As a result, if LUCE assignment was used as a subordinate assignment in ICA assignment, turns with a capacity of 0 were never used. This error has been fixed. **(19849 🚫)**
- ✔ Wait time from blocking back in assignment with ICA: In assignments with ICA, the wait time resulting from congestion on links with a constant VD function was ignored. This bug has been fixed. **(19867 🚫)**

## PuT Assignment

- ✔ Distinction between assignment and skim calculation in the dialog: In the parameters dialog of the timetable-based skim calculation you could activate the option 'Calculate assignment', however its value was not retained. Now this value is retained, but switching on this option changes the type of procedure to 'PuT assignment' while retaining all parameters that are identical for both procedures anyway. **(19396)**

## PuT Line Blocking

- ✔ Crash when deleting vehicle journey sections: No more crash when deleting vehicle journeys or vehicle journey sections when a line block editor is open that displays block items of these vehicle journey sections. **(19864)**

## Scenario Management

- ✔ Creating a new modification too complicated: When you create a new modification, the start state on the basis of which the modification is defined (consisting of the base version and all modifications on which the new modification depends) is created twice before editing begins. This bug has been fixed. **(19899)**

## Scenario Management, Visum Files

- ✔ Coupling is lost when using model transfer files: When applying a model transfer file or a modification in a scenario management project, couplings were lost if the change consisted of renumbering nodes or splitting links traversed by the line routes on which the coupled vehicle journeys were defined. This bug has been fixed. **(19731)**

## Schematic Line Diagram

- ✔ Edges are no longer displayed in raster units: Under certain circumstances, the edges in the schematic line diagram were no longer displayed in raster units, but in mm sizes. In particular, they no longer scaled when the zoom level was changed, but kept their absolute size. This error has been fixed. **(19793)**

## Subnetwork Generator

- ✔ Analysis time intervals up to 24h without calendar: Creating a subnetwork did not work if the network had no calendar, but analysis time intervals were defined, one of which ended at 24:00. This bug has been fixed. **(19882)**

## Visum Files

- ✔ Attributes of data type 'Percent': Attributes of data type 'Percent' were handled inconsistently when writing and reading network, demand, and model transfer files by saving the internal value (i.e. for 25% the value 0.25) when writing, but then interpreting this value as a percentage when reading it in. As a result, input attributes of this type were reduced by a factor of 100 during writing and later reading. This bug has been fixed. **(19863)**
- ✔ Missing standardization of matrix references in files: For attributes that are matrix references (e.g. the demand matrix at the demand description), the version and network file lacked the standardization of the representation in the file. As a result, for example, a version or network file that was written while the interface language was not English could only be read if the interface language was the same as the one set when it was saved. This error has been corrected. **(19625)**
- ✔ No legend for selective reading of graphic parameters: When selectively reading a graphic parameters file, the settings of the legend were not adopted, regardless of the parameter responsible. This error has been corrected. **(19777)**

## Visum Files, Scenario Management

- ✔ Crash when deleting passenger trip chains via model transfer file: Crashes no longer occur when trying to delete a non-existent chained up vehicle journey section in the network by applying a model transfer file or a modification in a scenario management project. **(19698)**

## ❗ Breaking Changes

### PrT Assignment

- ❗ Factor before tCur in the impedance function can cancel closure: If a coefficient smaller than 1 is specified in the impedance definition for the travel time in the loaded network tCur, closed links (e.g. with an empty transport system set) in the assignment variants (classic) 'Equilibrium assignment', 'Equilibrium assignment LUCE', or 'Equilibrium assignment Bi-conjugate Frank-Wolfe' could still be used under certain circumstances, but in practice only with extremely small pre-factors. This error has been fixed. The assignment results of the three procedure variants mentioned can therefore change in the affected networks. **(19873)** ✔
- ❗ Turns with capacity 0 in assignment with ICA and LUCE: In the Equilibrium assignment LUCE turns with a capacity of 0 were previously always considered closed. However, this criterion does not necessarily apply to ICA assignment. As a result, if LUCE assignment was used as a subordinate assignment in ICA assignment, turns with a capacity of 0 were never used. This error has been fixed. This changes the results of LUCE assignment and ICA assignment with LUCE as subordinate assignment. **(19849)** ✔
- ❗ Wait time from blocking back in assignment with ICA: In assignments with ICA, the wait time resulting from congestion on links with a constant VD function was ignored. This bug has been fixed. This changes the results of the assignment with ICA in networks with blocking back and constant VD functions. **(19867)** ✔

18.02-08 [140532]

2019-03-06

## + New Features and Changes

### Installation

- + Diagnostics program: Diagnostics for PTV Visum has been integrated in the Setup. **(15973)**

### Network Comparisons

- ⊕ Warning for version comparison with OD pair filter: If an OD pair filter with the option 'Filter network volumes' is active in the currently loaded network, the filtered volumes of a comparison network are always 0 in the version comparison, because the paths of a comparison network are never loaded. In this case, warnings are now issued when you create a version comparison indicating this fact. **(19664)**

## ✓ Fixed Bugs

### Add-Ins

- ✓ Aggregating a matrix to a main zone matrix with 'Calculate matrix': No more unjustified error messages when trying to aggregate a zone matrix to a main zone matrix using the Add-In 'Calculate matrix' if not all main zones have zones as sources. **(19765)**
- ✓ EVA weighting: No more crash of the Add-In due to the changed naming of the EVA procedure parameters. **(19819)**

### COM-API

- ✓ Changing the number of valid day '1': In the data model it was not prevented to change the number of the always available valid day '1'. In particular, this could be achieved via COM. As a result, crashes could occur, and version files written in this state were no longer readable. This bug has been fixed. **(19800)**

### Data Model

- ✓ Analysis period of several days in network without calendar: Under unknown circumstances, an analysis period of more than one day could occur in a network without calendar. This error has been corrected. **(19455)**
- ✓ Changing the number of valid day '1': In the data model it was not prevented to change the number of the always available valid day '1'. In particular, this could be achieved via COM. As a result, crashes could occur, and version files written in this state were no longer readable. This bug has been fixed. **(19800)**
- ✓ Undo changes to the transport system set of the mode: Changes to the attribute 'Transport system set' of a mode could not be undone. This bug has been fixed. **(19752)**

### Demand Procedures

- ✓ Editing EVA demand objects: By editing demand objects of an EVA demand model in lists, inconsistent states could occur. This bug has been fixed. **(19650)**

### Dialogs

- ✓ Balancing intervals in SBA: The times of the balancing intervals in the procedure parameters dialog of the simulation-based assignment (SBA) could not be edited correctly. This bug has been fixed. **(19820)**
- ✓ Classified display: When editing class limits for classification, a state of unclear class limits could occur in which a misleading error message was displayed. This bug has been fixed. **(18217)**
- ✓ Crash in demand model dialog: Crashes no longer occur when opening the demand model dialog if a demand model was previously created in this dialog, but the dialog was then exited with 'Cancel'. **(19799)**
- ✓ Decimal places for bar labels: The option 'Hide if (absolute) value <=' in the graphic parameters dialog for bars only displayed two decimal places. Now at least four decimal places are displayed (however, a variable number of decimal places is still not possible). **(19657)**
- ✓ Displays in the filter dialog: In the filter dialog, the column 'Operand' and the object of the selected attribute were not displayed correctly in some cases. This bug has been fixed. **(19584)**
- ✓ Loading filters: A progress dialog with a cancel option has been introduced for displaying filters, since checking the appropriate type for a large number of filters can sometimes take a very long time. If the loading of the filters is aborted, the filter dialog is still opened, possibly with an incomplete drop-down list. **(19797)**
- ✓ Selection of the link type via keyboard: In the 'Edit link' dialog the selection of the link type was no longer possible by entering the link type number into the selection list 'Type' via the keyboard. This bug has been fixed. **(19711)**
- ✓ Undo of network settings: Changes to network settings could not be undone. This bug has been fixed. **(19377)**

### Filters

- ✓ Displays in the filter dialog: In the filter dialog, the column 'Operand' and the object of the selected attribute were not displayed correctly in some cases. This bug has been fixed. **(19584)**
- ✓ Filter conditions for numerical enumeration types with several characteristics: No more crashes when changing the numbers of network objects that occur in filter conditions in the form of quantity-valued attributes. Example: There is a filter condition on the attribute 'Vehicle combination set' of vehicle journey sections and the number of a vehicle combination is changed. **(19653)**

- ✔ Loading filters: A progress dialog with a cancel option has been introduced for displaying filters, since checking the appropriate type for a large number of filters can sometimes take a very long time. If the loading of the filters is aborted, the filter dialog is still opened, possibly with an incomplete drop-down list. **(19797)**
- ✔ Wrong column header in the filter dialog: Under certain circumstances a wrong column header was displayed for the column 'Operand' in the filter dialog. This bug has been fixed. **(19746)**

## Graphical Procedures

- ✔ PuT shortest path search only on active vehicle journey sections: No more crash when changing the filter if a PuT shortest path search with the option 'Only active vehicle journey sections' has been executed before and one of the vehicle journey sections used in the shortest path becomes inactive due to the filter change. **(19808)**

## Graphics

- ✔ Backgrounds from subfolders of the project directory: Backgrounds whose graphic files are located in a subfolder of the corresponding project directory could not be loaded if this project directory was not identical with the current working directory. This bug has been fixed. **(19780)**

## I/O Interfaces

- ✔ Import of PuT supply from Visum with bundling and intermediate points: If both the consideration of intermediate points and the bundling of line routes in the destination network were activated when importing a PuT supply from Visum, an invalid course of the line route could occur in certain constellations. This bug has been fixed. **(19702)**

## Junction Editor

- ✔ Split window layout recovery: The split window top and bottom layout recovery often failed when the screen geometry was different than when saving the version file. This bug has been fixed. **(19297)**

## Lists

- ✔ Foreground and background color for lists without a filter: In lists that do not provide a filter 'Show only active elements', the buttons for selecting the foreground and background color were missing in the graphic parameters dialog for the variant 'Uniform display'. This bug has been fixed. **(19089)**

## Main Window

- ✔ Attributes editable in the search dialog: Attributes of the listed network objects were editable in the search dialog. If changes were actually made to the attributes, the program crashed. This bug has been fixed. **(19663)**
- ✔ Synchronization of messages related to many network objects: Similar to lists, if the synchronization of the message window is switched on and a message that has a reference to a large number of network objects is selected, no more network objects are selected (which may take a long time and cannot be canceled). If synchronization is also desired in this case, it can now be called explicitly. **(19157)**

## Matrix Editor

- ✔ Split window layout recovery: The split window top and bottom layout recovery often failed when the screen geometry was different than when saving the version file. This bug has been fixed. **(19297)**

## Network Comparisons

- ✔ Crash when using the network merge mode: A crash no longer occurs when the attribute 'Difference network status' is used for classification in the network merge mode. **(19745)**

## Network Editor

- ✔ Crash when inserting a new zone: A crash no longer occurs when inserting a new zone into the network if the zones are either classified by a matrix attribute in the graphic parameters or if a matrix attribute (e.g. matrix row sum) is used in the 'Marked' graphic parameters for zones. **(19790)**
- ✔ Managing backgrounds: Some background graphics available in the network were not displayed in the 'Background objects administration' dialog on the 'Administration' dialog page. This bug has been fixed. **(19119)**

## PrT Assignment

- ✔ Extension of roundabouts within SBA: For roundabouts where the leg attribute 'Number of conflicting lanes' had different values, the number of lanes within the roundabout was not generated correctly. This error has been fixed. **(19825 🚫)**

- ✔ SBA assignment with balancing time intervals of different lengths: If the balancing time intervals in a simulation-based dynamic assignment (SBA) had different durations, the calculation of the travel times and thus of the gap reached as well as the balancing between alternative paths were faulty. This has also impaired convergence behaviour. This error has been fixed. **(19823 🚫)**

## PuT Assignment

- ✔ Computation time-optimized algorithm for 'Optimal Strategies' and negative fares: The algorithm for the passenger information 'Optimal Strategies' cannot handle negative components in the fare (e.g. transfer fares), but did not check for this fact either. This error has been corrected, i.e. the procedure now issues an error message in this variant with the indication to use the variant that is not computation time-optimized. **(19540)**

## Schematic line diagram

- ✔ 'Marked' graphic parameters of the outer classification ineffective: If the outer classification was used in the schematic line diagram for edge courses, the graphic parameters set for the marked display were ineffective. This bug has been fixed. **(19710)**

## Subnetwork Generator

- ✔ Demand time series with special time series for zone type relations: When a standard percentage time series in the demand time series had overrides for special zone type relations, these were not transferred to the subnetwork when a subnetwork was created. This error has been corrected. **(19824)**

## Timetable Editor

- ✔ Crash after inserting vehicle journeys from clipboard: When more vehicle journeys were displayed in the opened tabular timetable than there was space available on screen, a crash could occur despite the bug fix of VISUM-19037, if this action was undone after inserting vehicle journeys from the clipboard. This error has been corrected. **(19689)**

## Visum Files

- ✔ Global layout with matrix histogram loses columns: If a global layout file contained a matrix histogram, all columns except the first two were missing in the table of the matrix histogram after importing this global layout. This bug has been fixed. **(19341)**
- ✔ Invalid filters in the global layout: When saving the global layout invalid filters could be written. Reading such global layout files were aborted with an error. This error has been fixed. **(19659)**

## 🚫 Breaking Changes

## PrT Assignment

- 🚫 Extension of roundabouts within SBA: For roundabouts where the leg attribute 'Number of conflicting lanes' had different values, the number of lanes within the roundabout was not generated correctly. This error has been fixed. The number of lanes within the internally expanded roundabout is the maximum of the number of conflicting lanes (leg attribute) and the number of lanes of the incoming link. The number of conflict lanes (leg attribute) are mapped as the number of lane turns of the nodes of the SBA internally expanded roundabout. **(19825 ✔)**
- 🚫 SBA assignment with balancing time intervals of different lengths: If the balancing time intervals in a simulation-based dynamic assignment (SBA) had different durations, the calculation of the travel times and thus of the gap reached as well as the balancing between alternative paths were faulty. This has also impaired convergence behaviour. This error has been fixed. **(19823 ✔)**

18.02-07 [139956]

2019-02-20

## ➕ New Features and Changes

### Data Model

- ➕ Internal memory limit for matrices: The internal memory for managing matrix data has been limited. This means that after initializing or deleting matrices, memory space is returned to the operating system earlier and does not remain reserved, and procedures with very high memory requirements are more likely to run through. **(19684)**

### Lists

- ⊕ 'Irrelevant' marker in the demand model: In lists for the network objects of the demand model (demand models, demand strata, person groups, activities, activity pairs, sectors and delivery concepts), attributes are now marked as irrelevant if they are not included in the calculation in the demand model used because of its type or because of other properties (e.g. O-D type of the demand stratum, etc.). **(19015)**

## Matrix Estimation

- ⊕ Preview of the shares even with a classified matrix: In the parameters dialog of the 'Demand matrix correction' procedure, the shares of the individual classes are now displayed in the table on the 'Distribution' dialog page, even if they were not entered directly, but result from the corresponding classification of the existing or selected matrix. **(19525)**

## Subnetwork Generator

- ⊕ Adopt time-varying attributes: When cutting a subnetwork, the definitions and values of time-varying attributes are now also transferred to the subnetwork. **(19571)**

## ✓ Fixed Bugs

### Add-Ins

- ✓ Wrong version number in OMX export: The add-in 'OMX export' saved a wrong version number to the exported file. As a result, problems could occur with reading systems. This bug has been fixed. **(19444)**

### Dialogs

- ✓ Column widths in traffic distribution parameter dialog: In the parameters dialog of the procedure 'Trip distribution' (in the 4-step demand model) the column widths of the table were not restored after closing and later opening the dialog. This bug has been fixed. **(19263)**

### Filters

- ✓ Display of the filter expression not updated: If a filter file was loaded via the button in the filter dialog, the filter expression displayed below for at least three filter conditions was not updated. This bug has been fixed. **(19583)**
- ✓ Formats after duplicating rows in the filter dialog: After duplicating rows in the filter dialog, the rows moved down no longer displayed the set comparison value in the correct format. This bug has been fixed. **(19755)**

### Graphical Procedures, Lists

- ✓ Display of flow bundle routes in paths lists for several demand segments: If the paths of several jointly assigned demand segments are displayed in a path list and the display is restricted to the flow bundle routes, the flow bundle condition is only checked for one of these demand segments. Thus, if one of the conditions of the flow bundle definition differentiated according to demand segments, the set of displayed paths was not complete. This bug has been fixed. **(19449)**

### Graphics

- ✓ Classification of directed objects: For directed objects (links and connectors), the cross-section logic was not taken into account for the classification, i.e. objects were always assigned to the classes according to the attribute value of the outward direction. This bug has been fixed. **(19616)**
- ✓ Incorrect classification for lane allocation: When classifying in the 'Lane allocation' layer according to a node attribute, some turns were assigned to an incorrect class. This bug has been fixed. **(19628)**

### Junction Editor, Schematic Line Diagram, Transfers Display of Regular Services

- ✓ Refresh after switching the current time interval: The three views Junction Editor, Schematic Line Diagram, and Transfers Display of Regular Services were not redrawn if the current time interval was switched, so that bars based on the current time interval were still displayed in the old state. This bug has been fixed. **(19230)**

### Line Blocking

- ✓ Deletion of user-defined block item types: If there was more than one block item of a user-defined block item type in a block, and this block item type was deleted, the network could no longer be saved as a version file, and the line block editor crashed when displaying the block in question. This error has been fixed. **(19753)**

### Lists

- ✔ Column filter with aggregation function 'Count': If an indirect attribute with the aggregation function 'Count' or 'Count active' was displayed in a column of a list and a column filter was defined for it, no meaningful value for the filter condition could be entered (except 0). This bug has been fixed. **(19247)**

## Matrix Editor

- ✔ Crash during aggregation without selected attribute: A crash no longer occurs if a dynamically aggregated display is selected in the matrix editor (same or different aggregation according to rows and columns), but no attribute is selected according to which aggregation is to be performed. **(19682)**
- ✔ Decimal places in function 'Round': The number of decimal places selected in the 'Round...' dialog in the matrix editor had no effect on the execution of the 'Round' action, but the setting 'Multiples of' was always used. This bug has been fixed. **(19669)**

## PrT Assignment

- ✔ Corrupt paths when applying the equilibrium assignment: When an equilibrium assignment was based on an existing assignment result (i.e. when this assignment result was used as initial solution), invalid PrT paths could result if an OD pair had no demand, but there were paths with a very small but positive volume for these in the initial solution. This bug has been fixed. **(19688)**
- ✔ Transport system-dependent user-defined VD functions faulty: The evaluation of user-defined VD functions was faulty if the value of the VD function depended on the transport system. This particularly affected convergence. This error has been fixed. **(19759)**

## PrT Assignment, PuT Assignment, Matrix Estimation

- ✔ Slow if matrix reference of a time series entry is empty: In the matrix time series of a demand segment individual matrix references can be empty, e.g. outside the assignment time interval. Such empty matrix references have so far slowed down the calculation unnecessarily. This bug has been fixed. **(19563)**

## PuT Operating Indicators

- ✔ Operator costs weighted with unavailable indicator: If an indicator whose value is zero at the network object operator is selected for the calculation of the operator costs in the infrastructure cost calculation for the weighting of the operator costs, very high negative values are generated when the total volume is distributed among the objects in the line hierarchy. This error has been fixed. **(19728)**

## Safety

- ✔ Error message in the 'Generic Accident Model': When executing the add-in 'Generic Accident Model' in a network set up for PTV Visum Safety, unwanted error messages occurred. This bug has been fixed. **(19675)**

## Timetable Editor

- ✔ Line route editor empty: If you rejected discarding an assignment result (and thus the insertion of the time profile) when inserting a time profile into a line route opened in the line route editor, the right half of the line route editor showed an empty table. This bug has been fixed. **(18983)**

## Visum Files

- ✔ Messages when procedure parameters are read in: When importing procedure parameters within a version file, warnings were displayed intermittently, although they were also presented collectively in the message window afterwards. If, on the other hand, a procedure parameters file was read in separately, the messages were not subsequently listed in the message window. Both errors have been fixed. **(19269)**
- ✔ Reading version files with planned connecting journeys slow: Reading a version file with a lot of planned connecting journeys was extremely slow. This error has been corrected. **(19690)**
- ✔ Version files with column chart graphic parameters: If a version file contained graphic parameters for column charts at a non-existent POI category, this version file could not be read. This bug has been fixed. **(19734)**
- ✔ Version files with link types greater than 127: Writing and later reading a version file failed if a contained link type had a number greater than 127. This bug has been fixed. **(19697)**

## Formulas

- ⊕ Control variable of a TableLookup via matrices in formulas: If a TableLookup statement whose control variable is a matrix was used in a formula, this control variable could not be used in a part of the expression to be evaluated for the control variable that expected a matrix, such as in the formula 'TableLookup(MATRIX M, M[NO]=[NO], MATRIXSUM(M))'. This bug has been fixed. **(19387)**
- ⊕ Output of control variables in ForEach: If a loop is used in the 'Combination of matrices and vectors' procedure using the 'ForEach' instruction, in the dialog, the system now displays which matrices would be changed when the current formula was executed and which would be newly created. When the procedure is actually executed, the changed and newly created matrices are logged (in the message window and log file). **(19212)**

## Main Window

- ⊕ Default aggregation functions in Quick view: In the Quick view, the 'Compare' aggregation function has always been used by default for editable attributes, even if other aggregation functions were more useful from a content perspective. Now the aggregation functions 'Compare', 'Distinct', and 'Histogram' are offered depending on the specific attribute. With these aggregation functions, it remains visible if several attribute values are involved when several objects are selected. **(19376)**

## Network Editor

- ⊕ Display of path sequence items: The network editor has been modified to display (and in particular label) selected path sequence items with the same origin and destination zone graphically. **(19209)**

## Other Procedures

- ⊕ Improved support for combining matrices and vectors: The parameters dialog of the procedure 'Combination of matrices and vectors' provides the user with better assistance. In particular, there is now a direct reference to the online help with additional examples and explanations as well as a preview of the matrices that will probably be changed or created during the execution of the procedure step. **(19340)**

## ✓ Fixed Bugs

### Dialogs

- ✓ Transport system selection for lane allocation: In the graphic parameter dialog of the network editor, the button for selecting the transport systems for which the lane allocation is to be drawn was missing on the 'Lane allocation' dialog page. This bug has been fixed. **(19634)**

### Formulas

- ✓ Context-sensitive functions and operators in the formula dialog: Previously, the functions and operators offered did not depend on the context of the current cursor position when the corresponding buttons in the formula dialog were activated. In particular, it was not distinguished whether matrices or scalars were required at the current positions. This error has been fixed. **(19072)**

### Graphics

- ✓ Multiline legend titles: In multiline legend titles, the individual lines of the legend title had too little line spacing and were even drawn partially overlapping. This bug has been fixed. **(19283)**

### Main Window

- ✓ Open global layout with a long passenger transfers list: No more crashes when importing a global layout file with an open passenger transfers list in a network in which this passenger transfers list has a lot of entries. **(19666)**
- ✓ Slow user interface in case of many marked messages: If a lot of messages are marked in the message window, PTV Visum reacted very slowly to the interactions of the user, even if synchronization was switched off. This bug has been fixed. **(19158)**

### Other Procedures

- ✓ Wait times for tour planning with dispatcher (MaaS): If tour planning for a MaaS demand segment was carried out with the dispatcher, the resulting PrT paths for the MaaS vehicles also contained the wait time between stops until the next journey for the passenger at the boarding node. This bug has been fixed. **(19622)**

### Transfers Display of Regular Services



- ✔ Switch of the calendar type: The transfers display of regular services did not respond correctly if the type of the calendar (no calendar / weekly calendar / annual calendar) was switched in the network, so that an incorrect display was displayed afterwards. This error has been fixed. **(19404)**

18.02-05 [138866]

2019-01-22

## + New Features and Changes

### COM-API

- + Paper size and orientation when printing: When printing using the `IGraphic::PrintNetEditor2D` method, the paper size and orientation of the print page can now be specified as optional parameters. **(18073 🚩)**

### Demand Procedures

- + Generation of path sequence activities when issuing path sequences in the tour-based model: If the generation of path sequences is activated in the 'Tour-based model - Combined trip distribution / mode choice' procedure, any missing path sequence activities are created automatically. These then refer to the respective activity in the demand model. **(19516)**
- + Tour-based distribution/mode choice no longer executable in case of contradictory information on path sequences: The 'Tour-based model - Combined trip distribution / mode choice' procedure now explicitly terminates with an error if the generation of path sequences is required but no valid path sequence set is selected. In addition, the parameter dialog has been improved in details. **(19515)**

### Formulas

- + Help in subdialogs of the formula dialog: The subdialogs accessible from the formula dialog, e.g. for inserting operators, operands and functions, now offer a context-sensitive help that can be opened by pressing the F1 function key. **(19608)**

### I/O Interfaces

- + Sequence of name components for railML and HAFAS import: In the parameter dialogs of the railML and HAFAS dialogs, the sequence of the name components in the naming rules for vehicle journeys, lines, destination coaches, etc. can now be changed subsequently without having to deselect and re-select the components in the correct sequence. **(18605)**

### Other Procedures

- + Minimization of fleet size in tour planning (MaaS): If the 'Use dispatcher' option is used in the 'Tour planning' (MaaS) procedure, a new parameter can be used to explicitly control the consideration between the most complete possible service of the trip requests on the one hand and the smallest possible number of vehicles used on the other. **(19436)**
- + Selection of the procedure variant for MaaS tour planning: In the dialog of the 'Tour planning' (MaaS) procedure, you can now switch between the 'Use xTour' and 'Use dispatcher' options for the actual optimization. **(18889)**

### Schematic Line Diagram

- + Graphic parameters dialog for inner classification of edge courses resizable: The graphic parameters dialog for editing the inner classification of a double classification of edge courses is now resizable. **(17962)**

## ✔ Fixed Bugs

### COM-API

- ✔ 'Only active' in `IPaths.SetRunTimes` did not work: The option 'Only active' did not work when setting travel times for PrT paths from SBA results (method `IPath.SetRunTimes`). This bug has been fixed. **(19536)**

### Data Model

- ✔ Special transfer walk times after deleting time profiles: If a time profile was deleted for which special transfer walk times existed at an unserved stop, these transfer walk times were not removed at the unserved stops. As a result, errors occurred when saving version files, for example. This bug has been fixed. **(19386)**

## Demand Procedures

- ✔ Create path sequences with joint coupling on the destination side in tour-based model: If the 'Tour-based model - Combined trip distribution / mode choice' procedure is activated to create path sequences for a demand stratum with destination coupling, the calculation of mode choice matrices was also implicitly activated, whereby output matrices possibly contained too large values. This error has been corrected. **(19613)**
- ✔ No more crash when specifying an invalid matrix reference for the output matrix of the utility on the 'Distribution utility' tab of the 'Tour-based model - Combined trip distribution / mode choice' parameters dialog. **(19287)**

## Formulas

- ✔ Random round with number of decimal places from attribute: No more crash when evaluating a matrix-valued formula in which the argument for the number of decimal places is taken from an attribute in the 'Random round' function. **(19544)**

## Graphical Procedures

- ✔ Time period of the PuT isochrones not in graphic parameters file: When saving and subsequently loading the graphic parameters file, the reference time period of a set PuT isochrone was not correctly restored. This error has been fixed. **(19472)**

## I/O Interfaces

- ✔ PuT supply from Visum with invalid references: Inconsistencies could occur when importing time profile items. This error has been fixed. When importing time profile items, boarding or alighting is only permitted if a stop point is located on the referenced line route item. **(19581)**

## Interfaces

- ✔ Crash at railML import with vehicle information: A crash no longer occurs when performing the railML import, if according to the parameters the vehicle information is to be stored in an attribute at the vehicle journey section, which does not exist in the target network. **(19254)**

## Lists

- ✔ Fare with PuT-Aux and short-haul fares in PuT path lists: No more crash when displaying a PuT path or PuT path leg list if the 'Fare' attribute is displayed for a demand segment that has not been assigned and there is a PuT-Aux transport system in the assigned demand segment and short-haul fares are used. **(19398)**
- ✔ Font sizes when changing the screen resolution: Previously, the font sizes for lists, tabular timetables, dialogs, etc. were saved in pixel size instead of in absolute size. This caused jumps in the actual font size especially when changing the screen resolution (e.g. by connecting a beamer or laptops by connecting to a docking station). This error has been corrected. In some cases it is necessary to reset the font size to default values once in the user preferences. **(19162)**

## Main Window

- ✔ Network check repair functions in message window: When calling the repair functions for messages generated by a 'Network check' function, a crash could occur if changes were made to the network between the network check and the repair function call. This bug has been fixed. In particular, the repair function no longer refers to the network objects objected to at the time of the check, but to the network objects objected to at the time the repair function was called. **(18109)**
- ✔ Open version file via symbol in toolbar: If you tried to open a version file via the 'Open' button of the menu item 'Version...' on the toolbar of the Visum main window, nothing happened. This bug has been fixed. **(19649)**

## Matrix Estimation

- ✔ Incorrect display in the dialog of the demand matrix correction: If in the 'Demand matrix correction' procedure (all variants) a distribution is used as count value and the shares are to be taken from existing matrices, the resulting shares are not displayed, but numerical values that do not match this setting. This error has been fixed by leaving the fields empty. **(19320)**

## PrT Assignment

- ✔ Equilibrium assignment slower for node impedances at main nodes: The classical equilibrium assignment had become significantly slower compared to PTV Visum 17 in networks with a lot of main nodes when using node impedances in connection with user-defined VD functions. This bug has been fixed. **(19423)**

## PuT Assignment

- ✔ Demand segment for perceived journey time PJT with timetable-based assignment: The selection of the demand segment, for which the perceived journey time is calculated and written to the resulting PuT paths, was moved from the 'Preselection' page of the parameter dialog of the timetable-based assignment (in the case of several jointly calculated demand segments) to the 'Demand segments' page, precisely because it is not only effective within the scope of the preselection. **(19421)**
- ✔ Faulty connection file after import of connection file: When saving a connection file with fares per path leg, a faulty file could occur in certain cases if the PuT paths had already been read in from a connection file which, however, contained fares per path. **(19579)**
- ✔ Message on vehicle journey items without vehicle journey sections: In the timetable-based assignment, vehicle journey items that have no allocated vehicle journey section and therefore a space capacity of 0 lead to the termination of the procedure. The message that provides information on this case has been improved. **(18720)**

## PuT Operational Indicators

- ✔ Crash caused by time profile items without a stop point: No more crash if, in a time profile, profile points occur on line route items with no stop points. **(19557)**

## Scenario Management

- ✔ Crash when inserting scenario indicators or procedure variables in multi-user operation: If simultaneous access by different users occurred during the joint editing of a scenario management project in multi-user operation while one of these users inserted a scenario indicator or procedure variable, a crash could occur for one of the users, depending on the constellation. This error has been fixed. **(19556)**
- ✔ Message when opening a scenario after calculation: When opening a scenario management project in which scenario indicators are defined, a warning occurred if scenarios had been calculated before and the project had been closed afterwards. This error has been fixed. **(19595)**
- ✔ Messages when importing scenarios: When opening scenarios with modifications, messages that occurred in the message window were not collected but deleted when further modifications were imported. This bug has been fixed. **(19189)**

## Subnetwork Generator

- ✔ Crash in case of assigned PrT demand segments with matrix time series: No more crash when generating a subnetwork if the network contains non-assigned PrT demand segments with allocated matrix time series. **(19562)**

## ❗ Breaking Changes

### COM-API

- ❗ Paper size and orientation when printing: When printing using the IGraphic::PrintNetEditor2D method, the paper size and orientation of the print page can now be specified as optional parameters. Because of the additional parameters, applications that integrate the COM API via Early Binding must be rebound. **(18073** [+](#))

18.02-04 [138060]

2018-12-17

## + New Features and Changes

### Junction Editor

- + Vissim previewer updated: The Vissim version used for the node preview has been updated to PTV Vissim 11.00-03. **(19442)**

### Lists

- + Column filter in attribute list: The column filter on the column 'ObjTypeName' has been improved in the 'Attributes' list. In particular, only those entries can be selected that are displayed in the list according to the set global filter (i.e. 'All attributes', 'Only network object types' or 'Only user-defined'). **(19124)**

### Main Window

- Project directories on the start page: Project directory files from the history of recently opened files are now also displayed on the start page. **(18406)**

## Visum Files

- Column charts in the global layout: The settings for open column charts in the network editor are now also saved in the global layout file. **(18894)**

## Fixed Bugs

### Data Model

- ✔ Infinite loop when adjusting blocks to data changes: An infinite loop could occur when adjusting blocks to changes in the underlying data, e.g. the pass through times of system routes used in empty trips. This bug has been fixed. **(18726)**

### Demand Procedures

- ✔ Better error messages for EVA weighting: The error messages issued by the 'EVA weighting' procedure in the case of overflows in the number range have been improved. In particular, the affected demand stratum is now mentioned. **(19222)**

### Dialogs

- ✔ Attribute selection in small dialog: If the 'large' attribute selection dialog, i.e. the one used in lists, was displayed too small, the field for the attribute description on the left side would hide the actual selection tree for attributes. This bug has been fixed. **(19499)**
- ✔ Crash in the parameter dialog of 'Matrix disaggregation': No more crashes when closing the parameter dialog of the 'Matrix disaggregation' procedure if no attribute selection was made for the disaggregation weights. **(19440)**
- ✔ Crash with filtered attributes in attribute selection dialog: No more crashes when leaving the attribute selection dialog if the previously selected attribute is no longer offered for selection after the set of attributes offered has been restricted, for example, by presetting the analysis time intervals. **(19466)**
- ✔ Embedded attribute selection does not adopt selection: If the attribute selection embedded in other dialogs is left without 'Return', e.g. by clicking another control in the dialog, an attribute selection made in it was not saved. This bug has been fixed. **(19498)**
- ✔ Empty branches hidden in attribute selection: In the attribute tree in the two variants of the attribute selection dialog, branches with no attributes are now hidden again. **(19328)**
- ✔ Infinite loop for progress dialogs: In certain constellations, overlaps of progress and other dialogs could result in an infinite loop, for example when reading a version file and restoring the opened views. This bug has been fixed. **(19360)**
- ✔ Initial sorting of attribute selection from user preferences: The initial sorting of the attribute selection was not transferred from the user preferences. This bug has been fixed. **(19145)**
- ✔ Table for line bars not filled correctly: In the 'Edit bars' dialog, the table on the 'Fill style' dialog page was not filled correctly in some circumstances in the case of line bars. This could lead to a subsequent crash. This bug has been fixed. **(19374)**

### Filters

- ✔ Reading a filter file with unknown attributes: No more crash when importing a filter file via the filter dialog of a special filter if the file contains references to attribute IDs that do not exist in the network. **(19461)**

### Graphics

- ✔ Draw N best objects for point-polygonal objects: The option 'Restrict object selection' in the graphic parameters did not work for point-polygonal objects (i.e. zones, main zones, POIs, territories, main nodes, toll systems). This error has been fixed. **(19271)**
- ✔ Only active objects in the route course layer and filter changes: If the 'Draw only active line routes' option was selected in the route course layer, the display did not update when the line filter was changed (or more generally when the active state of the objects was changed). This error has been corrected. **(19324)**

### I/O Interfaces

- ✔ Vehicle journeys without operator in VDV452 export: In VDV452 export, vehicle journeys with no assigned operator were no longer exported. This bug has been fixed. **(19463)**

### Miscellaneous

- ✔ Network check after deleting a transport system: No more crashes when executing a network check function that refers to a set of transport systems after a transport system has been deleted if it was included in the set of transport systems to be checked. **(19480)**

## Network Editor

- ✔ Aggregating line routes with activity protocol on: No more crashes when aggregating line routes if the activity protocol is enabled and the option 'Temporarily deactivate command history' is checked at the same time. **(19358)**
- ✔ Line route reroute also via closed links: If the 'Use also closed links for routing' option is switched off during the routing of a line route after a part of the new course had already been defined and closed links were used, the 'Edit course' operation could not be terminated. This error has been fixed by now offering to open the used closed links. **(18138)**

## Other Procedures

- ✔ Intersecting links with intermediate points: The 'Intersect' procedure produced an incorrect result if polylines with more than one segment (e.g. links with polygon points) were intersected with polygons (e.g. zones with surfaces) using the aggregation function 'Maximum share'. This error has been fixed. **(19456)**
- ✔ Invalid matrix reference in ForEach statement: If in the procedure 'Combination of matrices and vectors' the evaluation of a matrix reference within a ForEach statement fails, this loop pass was not skipped, but the target matrix was initialized. This bug has been fixed. **(19334)**
- ✔ Loops with ForEach in combination of matrices and vectors: A procedure step of the 'Combination of matrices and vectors' procedure is considered to have failed if it only makes one allocation and fails to do so. If several allocations are made using a loop with 'ForEach' and some of them do not succeed, the procedure is regarded as successfully executed, but no warnings for the unsuccessful allocations have been issued so far. Exactly this is the case now, i.e. a partially successful procedure of this kind results in warnings for the failed allocations. **(18753)**
- ✔ Procedure variable as target network object type in 'Edit attribute': Since PTV Visum 18.02-03, values of procedure variables could no longer be changed in the 'Edit attribute' procedure. This error has been corrected. **(19497)**

## PrT Assignment

- ✔ Crash when opening a PrT skim matrix: No more crash when executing the 'Calculate PrT skim matrix' procedure if it is set to open the calculated matrix in the matrix editor. **(19365)**

## Procedure Sequence

- ✔ Main window operable when executing procedures without progress dialog: If procedure steps in the procedure sequence were executed without a progress dialog, e.g. several steps of 'Combination of matrices and vectors', the Visum main window remained operable during procedure execution. Certain operations, such as terminating Visum during the execution of procedures, could cause the program to crash. This error has been fixed, i.e. the main window can no longer be operated during the execution of procedures. **(19201)**
- ✔ Procedure sequence layout: If the procedure sequence was open, changes to the procedure sequence layout were lost when restoring the view from the version file. This bug has been fixed. **(19524)**

## PuT Assignment

- ✔ Crash in the case of delay analysis with PuT Aux: No more crash in the calculation of the delay analysis if in a PuT path the relevant path leg is followed by a path leg covered with a PuT Aux transport system. **(19379)**
- ✔ Skim matrices for analysis time intervals outside the assignment period: In some cases, analysis time intervals outside the assignment period were also taken into account when calculating skim matrices for each analysis time interval. This bug has been fixed. **(19469)**

## PuT Line Blocking

- ✔ Endless loop in block check: In the unforced block check of an unchecked block, an endless loop occurred if empty trips were to be generated and a location fault existed before or after the first block item, which was an empty trip. This error has been fixed. **(19492)**

## PuT Operating Indicators

- ✔ Missing outputs in spatial PuT analysis: If the procedure 'Spatial PuT analysis' was executed with several cores, sometimes single results were missing, i.e. instead of a 0 an empty value was output. This bug has been fixed. **(19355)**

## Schematic Line Diagram

- ✔ Crash when aggregating line routes: No more crashes when aggregating line routes if the schematic line diagram is open and the 'Temporarily deactivate command history' option is enabled when aggregating. **(19311)**

## Timetable Editor

- ✔ Preview of the graphic parameters of the tabular timetable: The 'Preview' button in the graphic parameters dialog of the tabular timetable had no effect. This bug has been fixed. **(19278)**

## Transfers display of regular services

- ✔ Date interpreted incorrectly in transfers display of regular services: In the transfers display of regular services, the set date in networks with an annual calendar was interpreted incorrectly in certain cases. **(19115)**

18.02-03 [137494]

2018-11-29

## + New Features and Changes

### COM-API

- + Better messages if the script component fails to start: If the script component cannot be started, e.g. because of a non-existent, unsuitable or incomplete Python installation, the message now provides more information about possible causes. **(9372)**

### I/O Interfaces

- + Not uniquely assigned ocp at the beginning or end of a trainPart in railML import: If a trainPart element starts or ends at an ocp that is not or not uniquely allocated to a stop point in the Visum network, this trainPart could not be read in during railML import. This case is now handled by using the nearest ocp for ambiguously assigned ocp. If an ocp is not located in the target network at all, the trainPart (and thus the resulting vehicle journey) is shortened to the next allocated ocp with a stop. A trainPart is therefore only completely omitted in very rare cases, e.g. if there is not any clearly allocated ocp in the route course. **(18326)**

### Installation

- + Russian manual: The installation now also contains a manual in Russian, but it refers to an older version (PTV Visum 15). **(19354)**

### Junction Editor

- + Save / open layout: The junction editor layout can now be saved and read explicitly via a menu entry. **(13232)**

### Lists

- + Attributes list improved: The usability of the Attributes list has been improved in some respects. **(19053)**

### Other Procedures

- + 'Combination of matrices and vectors' with a lot of matrices: The 'Combination of matrices and vectors' procedure was accelerated in networks with a large number of matrices. **(18940)**
- + More network object types in the 'Edit attribute' procedure: The 'Edit attribute' procedure can now also be used for the following network object types: Activities, activity chains, activity pairs, operators, sectors, ticket types, operating periods, vehicle units, vehicle combinations, vacation days, delivery concepts, matrices, modes, demand models, demand strata, demand segments, main lines, person groups, structural properties, fare systems, fare zones, block items, block item types, transport systems, valid days, path sequence activities, path sequence sets. **(19342)**
- + Tenant selection for PTV MaaS Modeller: If a PTV MaaS Modeller user belongs to several tenants, the tenant to be used for the calculation run started from the Visum procedure sequence can now be selected in the Visum MaaS Modeller license dialog. **(18475)**

### PuT Assignment

- + Acceleration of the Branch&Bound search: The timetable-based assignment in the Branch&Bound search variant was slightly accelerated. The extent of acceleration depends on the nature of the individual network. **(17442)**

## PuT Operating Indicators

- ⊕ Warning for very long passenger trip chains: Before the 'PuT Operating Indicators' procedure is executed, a warning is now issued if there are passenger trip chains in the network whose stay time is longer than one hour. The stay time of passenger trip chains is estimated as service time, so that unintentional long passenger trip chains, e.g. as they occurred during GTFS import with the Add-In (up to Visum 17), can have a large influence on this. **(19359)**

## Visum Files

- ⊕ File extension for PrT skim matrices: The file extension for PrT skim matrices written in csv format has been changed from 'CSV' (in upper case) to the common extension 'csv' (in lower case). **(19370)**

## ✓ Fixed Bugs

### ANM

- ✓ Vissim route export with coordinates for roundabouts: Wrong coordinates were output for routes whose course led through main nodes, which made the import into a corresponding network in PTV Vissim difficult or prevented it entirely. This error has been fixed. **(19407)**

### COM-API

- ✓ Deleting many matrices too slow: Deleting all matrices in an IMatrices container using the RemoveAll command took much longer than interactively deleting the same set of matrices. This bug has been fixed. **(18941)**
- ✓ Load numpy after ChangePythonSysPath: After calling the 'ChangePythonSysPath' method from the 'VisumPy/SysPath' module, numpy could no longer be loaded. This bug has been fixed. **(19380)**
- ✓ railML export fails with COM references to network objects: The railML export failed when called via COM if COM references to Visum network objects still existed at the time of calling. This bug has been fixed. **(19369)**

### Data Model

- ✓ Default transport systems for main turns from underlying network: Previously, the default transport system set for a newly inserted main turn was the cut set of the transport system sets of the incoming and outgoing link, as for turns. Now, those transport systems are removed from this cut set for which there is no path between these two links in the underlying nodes-links-turns network. **(19322 🚫)**

### Demand Procedures

- ✓ Possible 'Nested Demand' crash with multiple cores: No more crashes when running the 'Nested Demand' procedure with multiple cores. **(19422)**

### Dialogs

- ✓ Attribute selection dialog for nested version comparisons: Crashes no longer occur in the attribute selection dialog if a version comparison with a network loaded in the background in turn contains a version comparison. **(19353)**
- ✓ Attribute selection for HighDPI: The attribute selection dialog has been improved for use on HighDPI screens. **(19295)**
- ✓ Bars in the print preview: No more crashes in the print dialog if the mouse is positioned on a visible bar in the print preview so that it is highlighted. **(19441)**
- ✓ Crash at PuT update parameters dialog: No more crash when opening the parameters dialog for the import 'PuT supply from Visum' if you have already used it in the session before and a new version file is loaded afterwards. **(19345)**
- ✓ Diagonal settings for skims in general procedure settings: In the 'General procedure settings' dialog, changes to the settings for the diagonals on the two 'Skims' pages (PrT and PuT) were not applied. This bug has been fixed. **(19279)**
- ✓ Double-click on attribute with subattributes in attribute selection: In the 'large' attribute selection dialog, which is used in lists for example, a double-click on an attribute with subattributes led to the transfer of all subattributes to the list of selected attributes if the tree was scrolled in such a way that not all of them were visible when the subattributes were expanded. This bug has been fixed. **(19087)**
- ✓ Graphics in the footer of the legend in French: If the user interface was displayed in French, the input field for the height of graphics in the footer of the legend was not visible. This bug has been fixed. **(19323)**
- ✓ User interface remains operable despite progress dialog: If a non-modal floating dialog, e.g. the lines / line routes dialog of the network editor, was opened and then a progress dialog appeared triggered by an action, the program interface remained operable. If in this state other actions were triggered before the previous one was finished, the program could crash. This bug has been fixed. **(19174)**

## Graphical Procedures

- ✔ Crash when exiting Visum: Visum crashes no longer on exit if the 'Graphics tools' toolbar on the 'Flow bundle' page was open during the session and closed later. **(18841)**

## I/O Interfaces

- ✔ Multiple PuT updates with line course replacement: Repeated import of the same PuT supply from Visum with the option 'Replace or delete active lines in the target network' with identical parameters led to zigzag routes of line routes. This bug has been fixed. **(19270)**

## Lists, Other Procedures

- ✔ Sporadic crashes in certain lists and multimodal assignment: No more sporadic crashes during the execution of multimodal assignments or when opening lists in which attributes are displayed that refer to node geometry data or to the assignment results of simulation-based dynamic assignment (SBA). **(19417)**

## Main Window

- ✔ Version file with column charts not readable: A crash no longer occurs when opening a version file and restoring the window layout if column charts were open. **(19425)**
- ✔ Visum window disappears behind other windows: In some cases, especially when displaying progress dialogs, the Visum main window disappeared behind the windows of other applications on the screen. This bug has been fixed. **(18979)**

## Matrix Editor

- ✔ Multiplication with constant: Multiplication of a matrix with a constant did not work. This error has been fixed. **(19364)**

## Network Editor

- ✔ Charts with only one pie slice: For charts with only one pie slice (i.e. circles whose diameter is scaled with the attribute value), a line was drawn to the center of the circle. This error has been corrected. **(19286)**
- ✔ Multi-editing of POIs aggregates them: When editing POIs of a category multiple times, the aggregation of POIs was started in some cases, although this special function was not selected. This bug has been fixed. **(19433)**

## PrT Assignment

- ✔ Calculation error when optimizing the proportionality in LUCE: With the PrT assignment procedure 'LUCE', a calculation error could occur when the option 'Optimization of the proportionality of route volumes at meshes' was activated, so that no real numerical value was output as volume. As a result, the ICA calculation could not be carried out correctly. This bug has been fixed. **(18904 🚫)**
- ✔ Deceleration due to node impedances: In Visum 18, node impedances in equilibrium assignment are updated more frequently to achieve more correct values. However, in some networks the equilibrium assignment became considerably slower when node impedances were used. Especially for main nodes the evaluation was accelerated again, but remains slower (but more correct) compared to Visum 17. **(19434)**

## PuT Operating Indicators

- ✔ Projection of user-defined attributes not stable: The projection of user-defined attributes of vehicle journey sections and vehicle journey items was not stable for the network objects time profile, vehicle journey, and vehicle journey section when using several calculation cores, i.e. the results could differ minimally when executing several times with the same input data. This error has been fixed. **(19169)**

## Timetable Editor

- ✔ Image section of the graphic timetable from the global layout: When loading a global layout file, the graphic timetable did not use the saved image section immediately, but only when clicking in the window. This error has been corrected. **(18938)**

## Visum Files

- ✔ Save new matrix to separate file: No more crash when saving a version file with the property that matrix data is saved in a separate file if a matrix was previously initial, i.e. had no values other than 0. **(19091)**

## 🚫 Breaking Changes



## Data Model

- ❗ Default transport systems for main turns from underlying network: Previously, the default transport system set for a newly inserted main turn was the cut set of the transport system sets of the incoming and outgoing link, as for turns. Now, those transport systems are removed from this cut set for which there is no path between these two links in the underlying nodes-links-turns network. As a result, certain turns may be closed by main nodes, and PrT assignment results change accordingly. **(19322)**

## PrT Assignment

- ❗ Calculation error when optimizing the proportionality in LUCE: With the PrT assignment procedure 'LUCE', a calculation error could occur when the option 'Optimization of the proportionality of route volumes at meshes' was activated, so that no real numerical value was output as volume. As a result, the ICA calculation could not be carried out correctly. This bug has been fixed. This potentially changes all assignment results calculated with LUCE and proportionalization switched on. **(18904)**

18.02-02 [136657]

2018-11-02

## + New Features and Changes

### Demand Procedures

- + Creating tours with the tour-based model: When executing the procedure 'Tour-based model - Combined trip distribution / mode choice', it is now possible to optionally output path sequences, which result from random dicing of the zone transfers according to the transfer probabilities calculated in the tour-based model and thus represent the result of the distribution and mode choice in an exemplary manner. **(17408)**

### PuT Assignment

- + Acceleration for PuT walk links: The management of PuT walk links has been accelerated. **(18670)**

### Visum Files

- + Flow bundle definition in global layout: Global layout files now also contain the flow bundle definition. **(18891)**

## ✓ Fixed Bugs

### COM-API

- ✓ Redrawing the network editor after switching the current time interval: After switching the current time interval via COM (setting the CurrentTimeInterval property at IAnalysisTimes), the network editor was not redrawn so that particularly the effect of bars based on the current time interval was not visible. This bug has been fixed. **(10134)**

### Data Model, Timetable Editor

- ✓ Operating period number not empty: In the timetable editor it was not possible to assign no operating period to the attribute 'operating period number' via the drop-down list. This bug has been fixed. **(19219)**

### Dialogs

- ✓ Adapting the attribute selection to a changed preselection: Crashes no longer occur when adapting the attribute selection to a changed preselection (e.g. analysis horizon). **(19232)**
- ✓ Attribute selection dialog crashes if aliases are invalid: The attribute selection dialog no longer crashes if an aggregation function that can only process numerical attributes (sum, average) is expanded and there is an alias for a non-numerical attribute at the target network object of the expanded relation in the network. **(19308)**
- ✓ Insert all input attributes: No more crash when adding all input attributes to the selection in the attribute selection dialog. **(19240)**

### Formulas

- ✓ Combination of formula matrices with attributes: No more crash when opening a version file containing a formula matrix that references an user-defined attribute of type formula in its definition. **(19284)**
- ✓ Use of For Each statement: In some cases an infinite loop was initiated when using the For Each statement. This error has been fixed. **(19238)**

## Formulas, Matrix estimation

- ✔ Matrix estimation or assignment matrix after LUCE assignment: A crash no longer occurs when using the matrix correction procedure or the AssignedVolumeMatrix matrix formula function for a demand segment that was assigned with the PrT assignment variant 'Equilibrium assignment LUCE'. **(19282)**

## Formulas, Other Procedures

- ✔ Values of variables in combination of matrices and vectors: In the procedure 'Combination of matrices and vectors' the value of a procedure variable could not be used in the defining formula. This bug has been fixed. **(19255)**

## Graphical Procedures

- ✔ Flow bundle with DRT: If you selected a link term as condition for a PuT flow bundle, PuT links with DRT whose walk links start with this link were not selected. This bug has been fixed. **(19075)**

## Graphics

- ✔ Crash when switching off links: A crash no longer occurs when switching off the links layer if there are line bars with certain properties at links. **(19224)**
- ✔ Drawing best N objects for connectors: If the graphic parameters for connectors required the drawing of the N objects with the largest or smallest attribute value, the N/2 best connectors were drawn in both directions. This error has been fixed. **(19008)**

## Graphics 3-D

- ✔ Antialiasing: Antialiasing was handled differently between the 3-D graphic interfaces OpenGL and DirectX. This error has been fixed. **(19030)**
- ✔ Differences between DirectX and OpenGL: In the display of the 3-D network view, unnecessarily large differences occurred in the use of the graphic interface DirectX compared to OpenGL. These were adjusted. **(19029)**

## Installation

- ✔ Setup and Update under HighDPI: Some dialogs in Setup and Update could not handle high screen resolutions (HighDPI) well. This error was corrected. **(19220)**

## Line Blocking

- ✔ Save version file with secondary optimization criterion 'Even line blocks': If 'Line blocking' was set as secondary optimization criterion 'Even line blocks' in a procedure step, the version file or a procedure parameters file could not be saved without errors. This error has been fixed. **(18993)**

## Lists

- ✔ Indirect attributes seem to be editable: In lists for network objects that cannot be edited themselves (e.g. passenger transfers), indirect attributes of connected network objects (e.g. name of the From-vehicle journey) were displayed as editable attributes. It was possible to make changes to the list, but these entries were not saved. This error has been corrected, i.e. attributes in lists that are generally not editable are no longer displayed as network objects that can be edited. **(19184)**
- ✔ Walk times with indirect paths unstable: When opening a list 'Transfers and walk times in stop' and there is no assignment result in the network, the values of the attributes 'Minimum walk time including indirect paths', 'Walk time minus indirect walk time', 'Minimum walk time including indirect and external paths' and 'Walk time minus minimum walk time including indirect and external' could show wrong values if the use of multiple cores was set in the user settings. This error has been fixed. **(19165)**

## Network Editor

- ✔ Adjust print area to available printed page: The 'Adjust to available printed page' function for the print area previously only considered the width-to-height ratio, but not the output size. These two possible variants are now separated into two different functions: 'Adjust to available printed page' takes the actual output size into account, whereas 'Adjust width-to-height ratio to available printed page' only changes the width-to-height ratio. **(19146)**

## Other Procedures

- ✔ Consumption values for HBEFA calculation without initialization: If the emission calculation according to HBEFA had already been executed, the network was then saved as a version file, reopened later and the calculation was repeated without carrying out the procedure 'Init HBEFA-based emission calculation' beforehand, differentiated consumption values and vehicle km for diesel and gasoline vehicles resulted. This error has been fixed. **(19226)**
- ✔ Consumption values for HBEFA emission calculation without cold start: The consumption induced by cold start supplements has not yet been included in the output of the specific consumption values in the messages (log file and final message of the procedure) as part of the emission calculation according to HBEFA. This error has been corrected. **(19228)**

## Passenger Surveys, PuT Assignment

- ✔ Crash when saving a version file with PuT paths with user-defined attributes: No more crash when saving a version file if it contains PuT paths with user-defined attributes due to the import of survey data or connection files and then a zone is inserted (e.g. also by importing survey data). **(18695)**

## PrT Assignment

- ✔ Crash if path is not found in incremental assignment: A crash no longer occurs when executing the PrT assignment with the incremental procedure if no path could be found between two zones. **(19253)**

## PuT Assignment

- ✔ Log sum calculation incorrect for matrix time series: The calculation of the log sum of the impedance in the timetable-based assignment (or skim calculation) was faulty if the demand was described by a matrix time series with several time intervals. This bug has been fixed. **(19218)**
- ✔ Probability of a connection 1 in assessment of the risk of delay: When calculating the risk of delay, a given probability of a connection of 1 for a planned connecting journey did not work as expected (namely in such a way that this connecting journey had no risk), but as if no probability of a connection had been specified. This error has been corrected. **(19183)**

## Schematic Line Diagram

- ✔ Arrow head at inner edges: Marked inner edge courses within a transfer node were previously drawn with an (unintended) arrow head. This bug has been fixed. **(17531)**

## Transfers Display of Regular Services

- ✔ Undo for changes to the graphic parameters: If the 'Preview' button was pressed in the graphic parameters dialog of the transfers display of regular services and the changes made in this dialog were later undone, the status when the 'Preview' button was last pressed was restored instead of the status before entering the dialog. This bug has been fixed. **(19056)**

## Visum Files

- ✔ Procedure variables language-dependent: The definition of procedure variables was saved language-dependently to the version file. After changing the language for the interface, files with procedure variables could therefore no longer be read in completely. This bug has been fixed. **(19242)**

18.02-01 [136087]

2018-10-09

## + New Features and Changes

### Dialogs

- + Optimum table width by double-clicking on the separator in the line route editor: In the line route editor, the position of the separator can be adjusted to the current width of the left table with a double-click. **(17566)**

### I/O Interfaces

- + Aggregating optional with GTFS: When importing a General Transit Feed (GTFS), aggregating the resulting line routes is now optional. **(19096)**
- + Aggregation of line routes accelerated: The aggregation of line routes has been accelerated for many constellations. This applies both to the special function in the network editor and especially to aggregation in the context of the GTFS import. **(19097)**

- ⊕ Link stop points traversed multiple times when updating PuT supply: When importing a PuT supply from Visum, undirected link stops were traversed multiple times at the beginning or end of line routes, where the line route initially leads in the wrong direction to the end of the link and turns there. This is now avoided by an improved routing at both ends of a line route. **(18934)**

## Network Editor

- ⊕ Aggregation of line routes accelerated: The aggregation of line routes has been accelerated for many constellations. This applies both to the special function in the network editor and especially to aggregation in the context of the GTFS import. **(19097)**
- ⊕ Conversion of percentage time series to matrix time series: A new function in the 'Demand data' dialog, page 'Demand time series', can be used to convert a demand time series based on a standard time series into a matrix time series. This is particularly necessary as preparation before generating a subnetwork with a dynamic assignment result (SBA or timetable-based). **(18789)**
- ⊕ Switching between Edit and Insert mode: If you press the 'Insert' key repeatedly, the network editor toggles between the Edit and the Insert mode. **(18014)**

## PrT Assignment

- ⊕ Temporary closures in SBA: Temporary closures of a link that are modeled using a temporary value of the transport system set attribute are now taken into account in simulation-based dynamic assignment (SBA). **(19004 🚫)**

## ✓ Fixed Bugs

### Add-Ins

- ✓ Error messages in Add-In 'FareZone -> POI': If error messages occurred when using the network file generated by Add-In 'FareZone -> POI', they were not output to the user. This error has been corrected. **(19010)**

### COM-API

- ✓ Crash with ICrFunctions::CrFunction: No more crash when calling the COM method ICrFunctions::CrFunction if there is no Cr function with the specified number. **(18457)**

### Data Model

- ✓ Unwanted matrix type: In the matrix list 'INVALID' or 'ANY' could be selected as matrix type, which does not correspond to a usable matrix type in Visum. This bug has been fixed. **(19012)**

### Dialogs

- ✓ Background map preview without background color: The background map preview in the graphic parameters dialog of the network editor did not take the background color into account, although it manipulated the map like the intensity and grayscale setting. This error has been fixed. **(19163)**
- ✓ Crash when inserting an alias: Inserting an alias for network object types which have only relations but no own attributes no longer leads to a crash. **(19188)**
- ✓ Insert attribute for all scenario comparisons: If there is at least one version comparison in the network, some attributes were inserted several times when inserting an attribute for all scenario comparisons via the button provided for this purpose in the 'large' attribute selection dialog. This bug has been fixed. **(19050)**
- ✓ No background map in the print preview: A set background map was not displayed in the print preview. This bug has been fixed. **(19103)**
- ✓ Print preview draws too many intermediate states: The print preview in the print dialog was redrawn after every input, even if the input was not yet completed. This bug has been fixed. **(18339)**
- ✓ Set color for route course like main line: No more crashes in the graphic parameters dialog of the network editor when trying to set the display color to the color of main lines in the route course layer. **(19138)**
- ✓ Size information in the print dialog: In the 'Print' dialog the information about the calculated output size and the available space on the print page as well as the information about the number of tiles for tiled printing were not always correctly adjusted when changing the entries. This bug has been fixed. **(19191)**

### Formulas

- ✓ Relations with conditions only in later relation: Relations with a condition did not work if the first relation had no condition, but only the second or a later one in a chain of relations. This error has been fixed. **(19152)**

### Formulas, Network Editor

- ✔ Setting a matrix using an invalid formula: If you interactively calculate the values of a selected matrix using the action 'Combination of matrices and vectors' via a formula, the matrix is initialized (i.e. set to 0) if the formula is syntactically incorrect, instead of leaving the previous value unchanged. This bug has been fixed. **(17418)**

## Graphics

- ✔ Markings in print: Markings were no longer displayed in the printout or in the print preview. This bug has been fixed. **(19104)**

## I/O Interfaces

- ✔ Different operators in GTFS import: Up to now vehicle journeys with the same 'route\_short\_name' were combined to one line, even if they had different operators. This bug has been fixed. **(19098)**
- ✔ Import of PuT supply from Visum accelerated: The import of a PuT supply from Visum was unnecessarily slow and was accelerated in cases where many line route elements of the source network were not mapped but skipped to nodes or stop points in the target network. **(19093)**
- ✔ Link run times when importing an Emme network: When importing an Emme network, the link run times for each public transport system are now related to the specified link length and no longer to the direct distance length. Furthermore, the import no longer terminates if a stop was not found in the course of a line route. Only the line route item is then skipped. **(18495)**
- ✔ Unsorted shapes in GTFS: When importing a General Transit Feed (GTFS), the points of a shape for a line route were read in the order in which they are listed in the file, and not in a possibly different explicitly specified numbering. This error has been fixed. **(19149)**

## Junction Editor

- ✔ Crash when executing procedures: No more crashes when running a procedure sequence when a junction editor is open and shows turns. **(19126)**

## Line Blocking

- ✔ Blocks with time breaks at link stop points: When creating blocks with empty trips, there could be time breaks in the blocks if link stop points occurred in the terminal stop points. This bug has been fixed. **(19160)**

## Lists

- ✔ Messages when changing values from clipboard or attribute file: When importing an attribute file or values from the clipboard into an open list, warnings (e.g. that an assignment result has to be deleted) were not displayed reliably and did not appear in the message window. This bug has been fixed. **(18444)**
- ✔ User-defined attributes in the standard layout: In the standard layout of lists, user-defined attributes were no longer at the end of the list, but in the second to last position. This bug has been fixed. **(19151)**

## Miscellaneous

- ✔ Environment variables in paths: An environment variable specified in a path within the project directories was only resolved correctly if it was at the beginning of the path, but not at a later position. This error has been fixed. **(19154)**

## Network Editor

- ✔ Attribute selection of the column chart: When setting 'One column per analysis time interval' not all attributes with subattribute 'analysis time interval' could be selected, especially no user-defined attributes with this subattribute. This bug has been fixed. **(19167)**
- ✔ Rerouting line routes via closed links: When editing the course of a line route, in some cases the rerouting preview contained paths that led across closed links even if this was ruled out in the parameters. When confirming this new course, a message was issued stating that the new course could not be used as it contained closed links. This error has been fixed, i.e. the preview of routes now only contains links that are not closed, if possible, and can thus be used for the course. **(17225)**

## PrT Assignment

- ✔ End time in assignment quality lists for ICA and SBA: In the PrT Assignment quality lists for assignment with ICA and for simulation-based dynamic assignment (SBA), the previous attribute 'End time', which contained the date and time, was divided into two separate attributes for the end day and the end time. **(19090)**
- ✔ Time offset of the signal programs in SBA: When using daily schedules for signal controls in the simulation-based assignment (SBA), the time offset of the first signal program was previously applied to all signal programs and even overwritten in the .sig file. This error has been fixed. **(19131)**

- ✔ User-defined ideal flow rate for node impedance according to ICU: The user-defined ideal flow rate was not taken into account when calculating node impedances for signalized nodes according to ICU for left turns. This error has been fixed. **(19202 🚫)**

## Scenario Management

- ✔ Base version cannot be loaded (continued): Even after fixing the error described under ID 18759, certain situations persisted in which the base version could not be loaded when loading an uncalculated scenario. This error has been fixed. **(19205)**

## Schematic Line Diagram

- ✔ Vehicle journey selection under HighDPI: In the vehicle journey selection dialog of the schematic line diagram there were display problems on screens with very high resolution. In particular, it was hardly possible to visually distinguish between selected and unselected vehicle journeys or lines and directions. This bug has been fixed. **(19120)**

## Timetable Editor

- ✔ Crash after inserting a vehicle journey from the clipboard: If a vehicle journey from the clipboard was inserted into a tabular timetable in which there was a scroll bar due an excessive column width, and the insertion was subsequently undone, a crash could occur in some cases. This bug has been fixed. **(19037)**
- ✔ Tabular timetable does not show vehicle journeys: If you included a time profile in a previously empty line selection, whose line had several line routes in the direction of this time profile, you could reach a state in which the tabular timetable did not show all vehicle journeys of the marked time profiles. This error has been fixed. **(19000)**

## 🚫 Breaking Changes

### PrT Assignment

- 🚫 Temporary closures in SBA: Temporary closures of a link that are modeled using a temporary value of the transport system set attribute are now taken into account in simulation-based dynamic assignment (SBA). Naturally, this changes the assignment result if there are temporary closures in the network. **(19004 ➕)**
- 🚫 User-defined ideal flow rate for node impedance according to ICU: The user-defined ideal flow rate was not taken into account when calculating node impedances for signalized nodes according to ICU for left turns. This error has been fixed. This may change the assignment results. **(19202 ✔)**

18.02-00 [135444]

2018-09-20

## ➕ New Features and Changes

### Scenario Management

- ➕ Default folder for temporary files: The default folder for temporary files, which are created during the distributed calculation of scenarios or procedure steps in the procedure sequence (e.g. before the files are transferred to the compute node), was moved from the user directory to the temporary directory of the system (%TMP%). This means that when temporary files are deleted using the standard Windows procedure, these files are also deleted. **(19041)**

### ANM

- ➕ Export of routes and matrices with rounded demand: When exporting to ANM, the demand can now optionally be rounded. The method used ('Bucket Round') keeps the total demand as constant as possible. In addition to the volumes on the routes, the values of the exported matrices are also consistently rounded. If SBA is used for assignment and rounding to entire vehicles, the simulation paths in particular are retained. **(17406)**

### Add-Ins

- ➕ StreetLight Data: The company StreetLight Data from San Francisco offers OD data for any user-defined zone layers on its website. The add-in enables the retrieval of this data from PTV Visum. It sends the zone layer from the currently loaded version to StreetLight Data and imports the returned OD data as matrices. **(18784)**

### COM-API

- + Remove discontinued methods: The following discontinued methods have been removed from the COM-API: ITimeProfile.Couple, ITimeProfile.Uncouple, IStop.InitSpecialTransferTimes and at the INetReadRouteSearchTSys object the methods DontRead, InsertOrOpenLink, SearchShortestPath, UseExistingLineRouteCourses, DeleteOldLineRoutes and IgnoreItemsWithUnknownNetworkReferences. In the case of the INetReadRouteSearchTSys object, line route completion options are controlled by attributes accessible through the AttValue property. **(17930)**

## Data Model

- + Demand segment set at the demand stratum: At the demand stratum, the demand segments, in which the demand of this stratum enters, can now be modelled in a new attribute. This information is currently not used in the program, but will be used in the future to create a procedure sequence for a demand model. **(19046)**
- + User-defined attributes for signal coordination groups: Signal coordination groups can now also have user-defined attributes (data and formulas). **(16938)**

## Dialogs

- + Improvements to the 'Alias' dialog: In the 'Alias' dialog, the inputs already defined by the call context are now only displayed as labels. In addition, the first control that requires an input gets the focus after opening the dialog. **(17694)**
- + More modern attribute selection dialogs: Both attribute selection dialogs have been modernized. The 'small' version, which only allows the selection of one attribute, now appears as an input field with the possibility to search for attributes by name components. The 'large' version, which offers a range of attributes including formatting options, also allows a search, but also multiple editing of formatting options. **(18343)**
- + Name suggestion for 'Copy line': When copying a line, the previous name of the line is now offered as default (which of course has to be changed), analogous to line routes. **(18137)**

## Formulas

- + In formula attributes, new functions now also allow the use of terms that access matrices via aggregate functions, for example the total sum of a matrix. Conversely, scalar-valued terms can also be used in formula matrices, which in turn are derived from matrices via aggregate functions. **(12544)**
- + Naming of functions in the formula dialog: In the dialog 'Insert function', which can be reached from the formula dialog, the names of the available functions have been improved. **(19028)**

## Graphical Procedures

- + DRT in flow bundle and skims: In the PuT flow bundle, conditions for nodes and links can now also be set for PrT transport systems in order to be able to distinguish the volume of DRT (MaaS) systems from line and walk transport systems. Furthermore, the new skims 'DRT distance' and 'DRT time' can be calculated as skim matrices. **(18028)**

## Lists

- + Local filters for columns: In lists, the contents can be filtered according to attribute values in individual columns. This local filter is independent of the global filter for the network object and only works in the list, possibly in addition to other filters in the same list, for example 'Only active objects'. **(18015)**

## Other Procedures

- + DRT in flow bundle and skims: In the PuT flow bundle, conditions for nodes and links can now also be set for PrT transport systems in order to be able to distinguish the volume of DRT (MaaS) systems from line and walk transport systems. Furthermore, the new skims 'DRT distance' and 'DRT time' can be calculated as skim matrices. **(18028)**

## PrT Assignment

- + Effect of SC daily schedules in SBA: In simulation-based dynamic assignment (SBA), daily schedules of signal controls in the assignment time interval are taken into account. More precisely: For a signal control of the type Vissig, a daily schedule can be selected via an attribute, which then takes effect. For RBC controls, a daily schedule coded in it always takes effect if it exists, otherwise the set signal program takes effect continuously. **(16497 🚫)**

## Procedure Sequence

- + Default folder for temporary files: The default folder for temporary files, which are created during the distributed calculation of scenarios or procedure steps in the procedure sequence (e.g. before the files are transferred to the compute node), was moved from the user directory to the temporary directory of the system (%TMP%). This means that when temporary files are deleted using the standard Windows procedure, these files are also deleted. **(19041)**

- + Executing the entire procedure sequence on a compute node: Within the framework of distributed computing, it is now possible to execute the entire procedure sequence of a version file on a compute node, in particular also outside scenario management. **(13038)**

## PuT Operating Indicators

- + Indicators on vehicle journey level: Additional indicators are now also displayed for time intervals at the network object vehicle journey. This includes indicators for transport supply and transport performance. The updated list of indicators can be found in the document 'IndicatorAvailability.xls'. **(18011)**

## Visum Files

- + Default project directory on version file folder: The default project directory for almost all file types is now the respective folder of the currently loaded version file. In other words, after opening a version file in the program, Visum behaves as if the version file had been opened by double-clicking in the Explorer. In particular, the version file and the other files used in it can be shared if relative paths are used in the version file by copying the whole folder. **(19035)**
- + Desire line in the global layout: The settings of the desire line are now saved in the global layout. **(18893)**

## Fixed Bugs

### ANM

- ✓ Driving behavior 'cycle track': If the driving behavior 'cycle track' was used during ANM export, the resulting ANM file was not readable in PTV Vissim. This bug has been fixed. **(19088)**

### COM-API

- ✓ Unreliable access to procedure parameter objects: If a COM object was created for the procedure parameters of a specific procedure step (i.e. for a subobject of IOperation) and then certain changes to the network were made interactively, e.g. opening and closing the procedure parameters dialog (even without changes), subsequent method calls on the 'old' COM object sometimes had no effect, i.e. in a non-deterministic way. In order to recognize this very hidden problem at least reliably, method calls in this uncertain situation now reliably lead to an error. The situation should be avoided in COM scripts if possible by always fetching the COM objects of the subobjects fresh from the IOperation object. **(18997)**

### Data Model

- ✓ Coupled vehicle journeys on different sections of the same time profile: No more crash when switching off a profile point of a time profile in the coupling section of two vehicle journeys, if the line route of the time profile crosses the coupling section several times (e.g. circle line) and both coupled vehicle journeys belong to the same time profile, but the coupling sections of these vehicle journeys represent different local sections on this time profile. **(19009)**
- ✓ Empty reference to vehicle journey for territory PuT detail objects: If the procedure 'PuT operating indicators' is executed for a detail level larger than vehicle journey, the resulting territory PuT detail objects have no reference to a vehicle journey. In this case the attribute vehicle journey number showed the value 0 instead of an empty value. This bug has been fixed. **(18984)**

### Demand Procedures

- ✓ Mode in multiple demand models: If a mode referenced by multiple demand models was deleted from one demand model, also parameters of demand model procedures associated with another demand model using this mode got deleted. The bug has been fixed and the unaffected procedure parameters are now preserved. **(18932)**
- ✓ Numerical difficulties in Nested Demand: In the 'Nested Demand' procedure, overflow/underflow problems could occur when calculating the log sums if all impedances were very large or very small. This error was corrected. This also results in more accurate results. In particular, there are small numerical deviations in the calculation results. **(18968)**

### Filters

- ✓ Messages due to binary filter files in the project directory: If the project directory for filter files also contained binary format filter files written with earlier Visum versions, these led to error messages when starting the program, switching the project directory or opening the filter dialog. This bug has been fixed. The binary filter files are still not considered in the selection list for the existing filters. **(19039)**

### Formulas

- ✓ Attribute IDs in formulas: Attribute IDs referenced in formulas were converted to uppercase, breaking string comparisons in relations with conditions. This error has been fixed. **(19069)**



- ✔ Sub-attributes of indirect attributes: Sub-attributes of indirect attributes were not handled correctly in relations with condition. This error has been fixed. **(19070)**
- ✔ TableLookup without suitable object: The function TableLookup returned the value of the expression specified as the third parameter even if there was no network object that satisfied the condition (formulated in the second argument) as long as the expression did not access attribute values of the network object that satisfied the conditions. This error has been fixed, i.e. if there is no network object that meets the condition, TableLookup now always returns an empty value. **(17879)**

## Lists

- ✔ Attributes list does not remember filter setting: Previously, the attribute list did not remember the filter setting (user-defined attributes / network objects / all) when it was restored from the version file. This bug has been fixed. **(18879)**
- ✔ Column names in attributes list: In the attributes list, the column 'Object ID' used to show the name of the network object type or really the ID, as it is required in COM etc., depending on whether extended input options were activated in the list or not. This function is now performed by the new column 'Object type name', while 'Object ID' always outputs the ID. **(18845)**

## Matrix Editor

- ✔ Empty cells in the matrix editor: Matrix editors restored from a version file sporadically displayed empty cells, especially with a large number of zones. This could lead to a crash when closing Visum later on. This bug has been fixed. **(18628)**
- ✔ Set diagonal of asymmetric matrix: It was not possible to set the diagonal of an asymmetric matrix. This bug has been fixed. **(14894)**

## Network Comparisons

- ✔ Crash when comparing versions with attributes that no longer exist: No more crashes when opening a version file with a version comparison with attributes taken from the comparison network if attributes occur in this version that no longer exist in the current Visum version. **(18989)**

## Network Editor

- ✔ Messages for 'Multi-delete' at nodes: When executing 'Multi-delete' for nodes, messages resulting from this were not displayed in the message window. This error has been corrected. **(18532)**

## Passenger Surveys

- ✔ Plausible path without real use of public transport: A PuT path could previously be plausible if, on its way from the source zone to the destination zone, it only stopped at one stop area matching the specified line, but then did not use a vehicle journey, but continued directly as a walk link to the destination zone. This bug has been fixed. **(19066)**

## PrT Assignment

- ✔ Signal groups without green time in SBA: If there is a signal group without a green time, in the simulation-based dynamic assignment (SBA) this signal group acted as if it was always green. This bug has been fixed. In addition, there is now a warning if there are turns that have lanes to which only permanent red signal groups are allocated. **(18818)**

## Scenario Management

- ✔ Link IDs when integrating a project: When integrating a scenario management project into another one, the IDs of links were not handled correctly, so that new links could usually not be transferred. This bug has been fixed. **(18814)**
- ✔ Loading the base version when calculating multiple scenarios: When calculating the scenarios of a project, an error message occasionally occurred when loading the base version. This bug has been fixed. **(18759)**

## Schematic Line Diagram

- ✔ Import from version file slow: The import of a version file containing a schematic line diagram was unnecessarily slow and was accelerated. **(19025)**

## Signal time-space diagram

- ✔ Crash when editing graphic parameters: No more crashes when changing the width of the line style for paths in the graphic parameters dialog of the signal time-space diagram. **(19036)**
- ✔ Preview in the graphic parameters dialog was ineffective: The 'Preview' button in the graphic parameters dialog was ineffective. This bug has been fixed. **(18364)**

## Subnetwork Generator

- ✔ User-defined attributes with subattributes: User-defined attributes with subattributes, i.e. especially count values per analysis time interval, were lost when generating a subnetwork. This bug has been fixed. **(18884)**

## Timetable Editor

- ✔ Crash at 'Edit vehicle journeys in their course' for several coupled vehicle journeys: A crash no longer occurs in the 'Edit vehicle journeys in their course' sequence if several vehicle journeys from different time profiles are selected for editing and one of the edited vehicle journeys has a coupling partner on the same time profile as one of the other selected vehicle journeys. **(18982)**

## Visum Files

- ✔ Base volume from user-defined attribute: If the base volume is defined to be the value of some user-defined attribute that does not exist in the network, reading a version file containing this setup failed. This bug has been fixed. **(19130)**
- ✔ Changing a chained vehicle journey section with model transfer file: Until now it was not possible to change the chained vehicle journey section of a vehicle journey section (i.e. the destination of a passenger trip chain or forced chaining) by importing a model transfer file or by additive reading of a network file. This bug has been fixed. **(19068)**
- ✔ Reading a link type that does not exist in the network: If the link table of a network file is read in and a link exists which references a link type that does not exist in the network, the import of the network file aborted completely instead of skipping the affected link. This bug has been fixed. **(18970)**

## ❗ Breaking Changes

### Demand Procedures

- ❗ Numerical difficulties in Nested Demand: In the 'Nested Demand' procedure, overflow/underflow problems could occur when calculating the log sums if all impedances were very large or very small. This error was corrected. This also results in more accurate results. In particular, there are small numerical deviations in the calculation results. **(18968)**

### Formulas

- ❗ TableLookup without suitable object: The function TableLookup returned the value of the expression specified as the third parameter even if there was no network object that satisfied the condition (formulated in the second argument) as long as the expression did not access attribute values of the network object that satisfied the conditions. This error has been fixed, i.e. if there is no network object that meets the condition, TableLookup now always returns an empty value. This may change the results of calculation steps defined by formulas. **(17879)**

### PrT Assignment

- ❗ Effect of SC daily schedules in SBA: In simulation-based dynamic assignment (SBA), daily schedules of signal controls in the assignment time interval are taken into account. More precisely: For a signal control of the type Vissig, a daily schedule can be selected via an attribute, which then takes effect. For RBC controls, a daily schedule coded in it always takes effect if it exists, otherwise the set signal program takes effect continuously. If there are RBC controls with daily schedules in the network, the assignment result changes when SBA is used. **(16497)** [🔗](#)

18.01-02 [134410]

2018-08-29

## + New Features and Changes

### COM-API

- + New method ITableAttrSelection::RemoveColumn: The new method RemoveColumn at the ITableAttrSelection object allows to remove attributes of a table from the selection. If an attribute has subattributes and these are not specified in the parameter of the method, all subattribute values of this attribute are removed from the selection. **(19002)**

### Dialogs

- + Different structure of 'large' attribute selection dialog: In the 'large' attribute selection dialog, which allows not only the selection but also the formatting of columns, the attribute selection and the formatting options are no longer arranged one below the other, but next to each other. **(7406)**

## Graphics

- ⊕ The default value of the 3D graphics interface has been changed from OpenGL 3.0 to DirectX 11. **(18987)**

## Lists

- ⊕ Loading of the list 'Passengers transfer stops / time profiles' faster: The build-up of the list 'Passengers transfer stops / time profiles' was accelerated. **(18950)**

## PrT Assignment

- ⊕ Export from SBA for visualization: During simulation-based dynamic assignment (SBA), vehicle trajectories can be exported for external visualization. **(18777)**

## Visum Files

- ⊕ Text-based file exports in English: Until now, all text-based Visum files (i.e. network file, attribute file, demand file, model transfer file, interval file and multi-line survey data) were written in the language set for the user interface if it was German, English, French, Italian, or Polish. Now it is always possible to export in English, regardless of the languages available in the license. A user setting can be used to switch between English-language and localized export. **(18849 !)**

## ✓ Fixed Bugs

### COM-API

- ✓ Reading a matrix set from layout for matrix histogram: In the COM method OpenLayout of the IMatrixHistogram object, the parameter 'readMatrixSetFromFile' did not work, i.e. it was not possible to transfer the set of matrices from the layout. This error has been fixed. **(19001)**

### Data Model

- ✓ Deletion of transport systems and flow bundle: When deleting transport systems, a possibly existing PuT flow bundle definition was not adjusted correctly. As a result, the program could crash when writing the version file. This bug has been fixed. **(19006)**
- ✓ Invalid condition in conditional relations: Crashes no longer occur when evaluating a conditional relation if the condition itself is invalid as a formula, i.e. cannot be interpreted. **(18965)**

### Dialogs

- ✓ Graphic parameters for POIs: When entering the 'Points of Interest' page in the graphic parameters dialog, the drawing of this category was switched off for each POI category. This bug has been fixed. **(18872)**
- ✓ Inserting a large number of analysis time intervals: No more crash when inserting a large number of analysis time intervals (> 50,000) via the dialog 'Create multiple analysis time intervals'. **(18881)**

### Dialogs, Timetable Editor

- ✓ Vehicle combinations without vehicle units: Vehicle combinations can also exist without assigned vehicle units, but then they do not have a valid transport system and therefore cannot be used in vehicle journey sections or time profiles. The messages pointing to this fact have been improved. Furthermore, the user is now warned against this situation when editing a vehicle combination without vehicle units. **(18976)**

### Filters

- ✓ Multiple filter dialogs and evaluations: In several ways it was possible to obtain either several filter dialogs or several filter evaluations with the corresponding progress dialogs (and unclear results with interdependent filter conditions) simultaneously by fast successive interactions. This bug has been fixed. **(18966)**

### Formulas

- ✓ Conditional relation with aggregation function 'Count': When importing a network file with user-defined formula attributes, an unnecessary backslash was appended in formulas containing a conditional relation with the aggregation function 'Count'. This bug has been fixed. **(18964)**

## Lists

- ✔ Export of the PrT path list too slow: The export of the PrT path list had been slowed down compared to PTV Visum 17 and has now been accelerated again. **(18955)**
- ✔ Progress dialog for the list 'Passenger transfers stops / time profiles': If several demand segments were displayed, the list 'Passenger transfers stops / time profiles' could take a long time to build up and the program could appear to be crashed. Therefore there is now a progress dialog with the possibility to cancel. **(18949)**

## Schematic Line Diagram

- ✔ Better defaults for transfer bars: The defaults for transfer bars have been improved. Furthermore, the option to draw edges for the bars was removed, since it had no effect anyway. **(17777)**
- ✔ Larger symbols for branch and passenger trip chain/forced chaining: Previously, the symbols that could be set for branches and passenger trip chains/forced chainings were drawn too small, so that they were usually not recognizable. They are now drawn larger. **(17503)**

## Timetable Editor

- ✔ Message when moving a vehicle journey to another line: If you assign a coupled vehicle journey to a time profile in another line in the timetable editor and the run times on the coupled section are different, the couplings cannot be saved. In the message indicating this, the originally existing and the newly assigned time profile were reversed. This error has been fixed. **(19005)**

## Visum Files

- ✔ Backward compatibility of global layout files: A global layout file written with PTV Visum 18 contains additional contents not yet known in PTV Visum 17. Such additional contents could lead to the fact that the whole file could no longer be read in PTV Visum 17. This bug has been fixed. The contents not yet known in PTV Visum 17 are ignored during import. **(18933)**
- ✔ Chained up vehicle journey sections in version files: Invalid chained up vehicle journey sections in a version file previously meant that the file could not be imported. This error has been corrected by now displaying the faulty chained up vehicle journey sections as messages and importing the rest of the file. **(18985)**
- ✔ Time reference for binary matrix files: If a matrix is saved without time reference in binary matrix format, the non-existent time reference is written as '0' into the file and transferred to the data model when the file is read in later. As a result, the same matrix was no longer used as a matrix for a parameter without time reference, but a new matrix without time reference was created. This bug has been fixed. **(18919)**

## ❗ Breaking Changes

### Visum Files

- ❗ Text-based file exports in English: Until now, all text-based Visum files (i.e. network file, attribute file, demand file, model transfer file, interval file and multi-line survey data) were written in the language set for the user interface if it was German, English, French, Italian, or Polish. Now it is always possible to export in English, regardless of the languages available in the license. A user setting can be used to switch between English-language and localized export. The default value of this user setting is the English export, so that the program behavior changes unless the user setting is explicitly switched. **(18849 +)**

18.01-01 [133662]

2018-08-07

## + New Features and Changes

### Graphics

- + Opening files after graphical export: After a graphical export (screenshot, SVG export) the resulting file is opened immediately. **(18926)**

### I/O Interfaces

- + Acceleration of database export: Export to a database has been significantly accelerated. This acceleration depends on the database and the ODBC driver supporting the new procedure. This is at least the case for MS SQL Server with the latest driver. If the requirements are not fulfilled, the previous, slower variant is used. **(18526)**

### Installation

- + Safety and importers in demo version: In the demo version, you can now also use the Safety module and various importers, e.g. for OpenStreetMap. **(16207)**

## Network editor

- ➕ Projection for background maps: The option to adjust the network projection to the background map projection is no longer provided when the background maps are activated in order to reduce clicks. The adjustment can now quickly be triggered by a new button in the graphics parameters. Using a projection matching the background map will slightly speedup the loading of the background tiles, but at the cost of using different coordinates for the network objects. **(16569)**

## Procedure Sequence

- ➕ Use of variables: To make the use of variables more transparent, the result message of the procedure in which the variable has been used and the output to the message window have been improved. **(18840)**

## Visum files

- ➕ Read/write version files with assignment results faster: The reading and writing of version files with assignment results has been accelerated. **(18920)**

## ✔ Fixed Bugs

### COM-API

- ✔ Intersect: When intersecting attributes via `INet.IntersectAttributes`, an error message appears if there is no 'Intersect' procedure in the procedure sequence. This bug has been fixed. **(18917)**

### Data Model

- ✔ Marking of stops: If a stop with many connections is marked and the tool windows 'Marking' is open, Visum reacts very slow. This error has been fixed. **(18937)**

### Dialogs

- ✔ Project directories: The project directory folder for project directories, i.e. the .pfd file, did not point to the correct folder if the path contained %MAINVERS%. This error has been fixed. **(18957)**

### Graphics

- ✔ Bar scaling in legend: When showing the scaling of bars in the legend filtered values have not been taken into account. This error has been fixed. **(18886)**

### Lists, I/O Interfaces

- ✔ Database export of lists with empty values in key columns: If empty values occurred in a key column of a list, the list could not be exported to MS Access because in Access empty values are not allowed in key columns. This occurs, for example, when exporting a transfers list that contains boardings and alightings, because the key attribute 'Time' is empty for boardings and alightings. This error has been corrected by now outputting the value 0 instead of the empty value during the export. **(18300)**

### Miscellaneous

- ✔ Login to PTV Maas Modeller: If no default browser was set in the windows settings, PTV Visum could crash, while trying to log in initially to PTV MaaS Modeller. This bug has been fixed. **(18946)**

### Other Procedures

- ✔ Initialize filters: The procedure 'Initialize all filter settings' did not include filter settings for main relations. This error has been fixed. **(18942)**

### PrT Assignment

- ✔ Crash when executing the equilibrium assignment: No more crash when the equilibrium assignment is executed several times. **(18954)**
- ✔ Turning on red in SBA: In the simulation-based dynamic assignment (SBA), turns where turn on red is permitted were handled incorrectly: Vehicles could only drive in case of a green light, but then the set gaps took effect, so that the capacity was even lower than without turning on red. This error has been fixed, i.e. the set gaps now take effect in case of a red light, and vehicles can move unhindered when the light is green. **(18817)** 🚫

## PuT Assignment

- ✔ Skim matrices for stop areas: Initializing skim matrices for stop areas was very slow. This error has been fixed. (18907)

## Visum files

- ✔ Crash when importing a global layout: No more crash when importing a global layout file if a user-defined attribute that does not exist in the network is contained in a list in the global layout file. (18858)
- ✔ Import of couplings for omitted network references: If the option 'Ignore line route item with unknown network reference' was used when additively reading a network file with timetable data and couplings and the (optional) table Vehicle journey items was not read in, couplings between vehicle journeys also contained in the network file were lost in the network file. This bug has been fixed. (18366)

## ❗ Breaking Changes

## PrT Assignment

- ❗ Turning on red in SBA: In the simulation-based dynamic assignment (SBA), turns where turn on red is permitted were handled incorrectly: Vehicles could only drive in case of a green light, but then the set gaps took effect, so that the capacity was even lower than without turning on red. This error has been fixed, i.e. the set gaps now take effect in case of a red light, and vehicles can move unhindered when the light is green. This changes the assignment results of the simulation-based dynamic assignment (SBA). (18817 ✔)

18.01-00 [133146]

2018-07-22

## + New Features and Changes

### COM-API

- + Read and write access to transfer walk times for stop areas: The new property IStop.StopAreaTransferWalkTime allows read or write access to stop area transfer times at the stop. (17559)
- + Setting values of a matrix using a formula: With the new method IMatrix.setValuesToResultOfFormula the values of a matrix can be determined via a matrix-valued formula. There is no context in this formula, and the dimension must match the dimension of the matrix in Visum represented by the IMatrix object. (17326)

### Demand Procedures

- + Coupling across demand strata in EVA demand models: Until now, EVA demand models carry out origin- and destination-bound binding for each demand strata separately. Now, the binding can be coupled among all demand strata of an activity pair. (18305)

### I/O Interfaces

- + PuT Supply from Visum: When using the import of PuT supply from Visum intermediate points can be omitted if these points prevent matching to the target network. (18660)
- + Standards-compliant GTFS export: The GTFS export now always delivers a fully standards-compliant file. (16529)

### Installation

- + Update Python Engine: The Python installation distributed with PTV Visum has been updated to version 2.7.15. This also includes the package management system pip. (18424)

### Junction Editor

- + Vissim-Preview: The Vissim-Previewer is using PTV Vissim 11. (18800)

### Main Window

- + Hot key F7: The shortcut F7 can be used to trigger the aggregation of territories. (17455)

### Network Editor

- + Changing background maps: Showing and hiding different background maps is now also possible directly via the toolbar of the network editor. (18831)

- + Internet map requests no longer block: In certain cases, unanswered requests to the server of an Internet map service could freeze Visum. This is now avoided by completely decoupling the requests, i.e. you do not see the Internet map as long as the server does not answer, but you can continue working in Visum. **(13620)**
- + Length and duration of inserted system routes: When manually inserting a system route, its duration and length are now set to the totaled run times or lengths of the links traversed (instead of to the value 0 as before). **(18736)**

## Other Procedures

- + Signal offset optimization: A new version of the solution method has been added for the 'Signal offset optimization' procedure. This may change the results of the procedure. **(18869)**

## PrT Assignment

- + Skim matrix calculation for impedance in the stochastic assignment: It is possible to calculate a skim matrix for the total impedance within the stochastic assignment. This skim matrix contains components of the impedance defined over the entire path. **(17670)**
- + Speed-up: The evaluation of volume-delay functions has been accelerated. The shortest path search within the classical equilibrium and the incremental assignment, respectively, has been multithreaded. **(16995)**

## PuT Assignment

- + Faster headway-based assignment: The headway-based assignment has been slightly accelerated. **(14956)**
- + Skim impedance Log Sum: For the timetable-based assignment the skim matrix "Impedance Log Sum" can be computed. This option is available only if the choice model is "Logit". **(13682)**

## PuT Line Blocking

- + Active line block version: The option to set one line block version active has been removed. The line block version can be defined directly in the procedure 'PuT operating indicators'. **(2605)**

## Scenario Management

- + Global layouts for scenarios: Global layouts can now also be managed in a scenario management project. You can assign a global layout to a scenario that is used when the scenario is opened. You can also explicitly apply a global layout to another scenario to obtain a view suitable for displaying certain results, for example. **(17729)**

## Schematic Line Diagram

- + Arrange center labels using the toolbar: The action 'Arrange centered labels' is now also accessible via the toolbar of the schematic line diagram. **(18601)**

## Subnetwork Generator

- + Dynamic subnetworks: Subnetworks can be generated from network with dynamic assignments. For the allocation of demand to a time interval the entry time (and exit time, respectively) is considered. Pre-condition is the use of matrix time series. **(10825)**

## Visum Files

- + Graphic tools parameters in global layout: The global layout file now also contains the parameters for the graphic tools shortest path search, isochrones, and turn volumes. **(14126)**

## Fixed Bugs

### Data Model

- ✓ Consideration of switched off SC: If a signal control was switched off according to its properties, (main) nodes using this signal control were partly treated as signalized nodes anyway - especially in the ICA calculation. This error has been corrected. **(18854)**
- ✓ Inserting a profile point in a coupled section: If a time profile point is inserted in the coupled section of two or more vehicle journeys and a standard dwell time greater than 0s is defined for the associated stop point, either the arrival or departure times of the coupled vehicle journeys in the coupled section could become inconsistent depending on the constellation or the activation of the profile point could fail with an error message. This error has been corrected. **(18880)**

- ✔ Line network length at main lines: The attribute 'Line network length (directed/undirected)' showed the sum of the corresponding attributes of the lines of the main line instead of the total length of all links of the main line, so that links used by different lines entered the attribute several times. This error has been corrected. **(18827)**
- ✔ Line network length at transport system and operator: At the network objects transport system and operator, the attribute 'Line network length (directed/undirected)' displayed the sum of the corresponding attributes of the lines with a suitable transport system or operator instead of the total length of all links travelled by these lines, so that links travelled by different lines entered the total several times. This error has been corrected. **(18861)**

## Demand Procedures

- ✔ Demand matrix calibration after TRIBUT assignment: When executing the 'Demand matrix calibration' procedure after a TRIBUT assignment (TRIBUT-Equilibrium or TRIBUT-Equilibrium\_Lohse), an invalid error message occurred and the procedure could not be executed. This bug has been fixed. **(18557)**

## Dialogs

- ✔ Dialog too slow for export to PTV MaaS Modeller: The parameters dialog for export to PTV MaaS Modeller opened too slowly even with only medium-sized networks. This bug has been fixed. **(18748)**

## Formulas

- ✔ Relations with conditions at 'Count': When using the relations 'Count' and 'CountActive' no conditions could be specified. This error has been fixed. **(18876)**

## Graphics

- ✔ Wrong bar widths after procedure execution in single step: After the execution of a procedure (e.g. assignment) in a single step, the previous valid minimum and maximum values were used for the calculation of the bar widths in the network, so that bars with the property 'auto scale' had the wrong width. This bug has been fixed. **(18888)**

## I/O Interfaces

- ✔ Combining points of PuT supply: If two line route items of the source network are mapped to the same location in the target network when importing a PuT supply from Visum, then the data (in particular route point and profile point properties, boarding, alighting and times) are now taken from the more important line route item. The importance is given in this order: 1) start and end of the line route, 2) profile points, 3) route points, 4) stop points, 5) nodes without stop point or route point. **(16971)**

## Installation

- ✔ Python did not run after update: After updating the supplied Python 2.7 installation with a more recent Python 2.7 version, no more Python scripts could be started from within Visum. This bug has been fixed. Since a newer Python-2.7 version is supplied with Visum 18, this service pack must be installed in particular on computers on which Visum 18 is to be used. **(18782)**

## Main Window

- ✔ Synchronization of outbound lanes: If lanes on outbound legs of a (main) node were in the global selection, they were neither marked in a synchronized view of a model transfer file nor were messages related to these objects highlighted in the synchronized message window. This error has been corrected. **(18708)**

## Network Comparisons

- ✔ Copying UDAs while a version comparison is loaded: If a version comparison existed with a network loaded in the background, it was not possible to copy values from attributes of the version comparison into user-defined attributes. This bug has been fixed. **(18909)**

## Network Comparisons, Scenario Management

- ✔ Split PrT paths by link: If a user-defined PrT path is split and a model transfer file is created that converts the old to the new state, the course of the PrT path was lost when applying this model transfer file. In particular, this occurred in scenario management if a modification consisted of splitting a link. This bug has been fixed. **(18813)**

## Network Editor

- ✔ 'Clicking through' the legend: Mouse gestures executed above the legend (clicks, double-clicks, dragging) could affect network objects below the legend. This bug has been fixed. **(18760)**



- ✔ Edit course of several line routes slow: Changing the course of several line routes at the same time was unnecessarily slow in case of a lot of line routes and has been accelerated. **(18791)**

## Other Procedures

- ✔ Intersection of polygons with almost identical coordinate points: An error occurred during intersection if a source or target object was intersected with a buffer that had a face that contained several consecutive polygon points with almost identical coordinates. This bug has been fixed. **(18837)**
- ✔ Value ranges of the tour planning parameters (MaaS): For several tour planning parameters, different value ranges were defined in PTV Visum than in PTV MaaS Modeller. Subsequently, calculation orders with invalid parameters were rejected by PTV MaaS Modeller. This bug has been fixed. **(18792)**

## PrT Assignment

- ✔ Calculation error in fast variant of the blocking back model: The blocking back model provided incorrect results if the option 'Exploit capacities evenly (faster)' was active and only turn capacities, but no link capacities were taken into account. This error has been fixed. **(18183)**
- ✔ Demand from formula matrices with MPA: If connection shares were used for an assignment (PrT or PuT) and the demand originated from a formula matrix, then the demand was incorrectly distributed to the shares. In particular, the result was different when using a data matrix with the same entries. This bug has been fixed. **(18631)**
- ✔ ICA calculation for capacity or saturation flow rate 0: A capacity or saturation flow rate of 0 was not handled correctly in the ICA calculation. This error has been fixed. **(18890)**
- ✔ ICA calculation in assignments: When calculating an assignment, impedances at nodes are determined using the node impedance calculation according to ICA. If an error occurred during the calculation of the node impedances, the assignment itself was not canceled until now. This error has been corrected. **(18850)**
- ✔ PrT Assignment quality for LUCE: In the equilibrium assignment LUCE, it is not possible to account for the volumes of turns at non-exploded nodes in each iteration. Therefore, such turns are no longer considered in the attributes of the 'PrT assignment quality data' list that refer to turns. **(18023)**
- ✔ VD function 'Akcelik2' at length 0: The VD function 'Akcelic2' returned  $t_{Cur} = 0$  at length 0. In particular, the travel time in the loaded network  $t_{Cur}$  may have been lower than the travel time  $t_0$  in the unloaded network for each turn. This error was corrected by issuing  $t_{Cur} = t_0$  at length 0. **(18820)**
- ✔ Vehicle hours travelled  $t_{Cur}$  after LUCE assignment: In the 'PrT assignment quality data' list, the value of the attribute 'Vehicle hours travelled  $t_{Cur}$ ' was displayed in the attribute 'Vehicle hours  $t_0$ ' after a LUCE assignment. This error has been fixed. **(18568)**

## PuT Assignment

- ✔ Crash in case of Sharing with MPA: A crash no longer occurs when calculating timetable-based assignments with Sharing transport systems while using MPA if the option 'Use travel times of PrT transport systems as sharing travel times' is activated. **(18523)**
- ✔ Demand from formula matrices with MPA: If connection shares were used for an assignment (PrT or PuT) and the demand originated from a formula matrix, then the demand was incorrectly distributed to the shares. In particular, the result was different when using a data matrix with the same entries. This bug has been fixed. **(18631)**
- ✔ Discomfort in combination with MPA: If the skim Discomfort was calculated in a timetable-based assignment with MPA (i.e. with shares), the resulting matrix was always 0. This error was corrected. **(18688)**
- ✔ Stop range characteristic matrixes: The 'Calculate stop area skim matrix' method terminated with an unspecific error message if the numbers of the stop areas were too large. This bug has been fixed. **(18458)**

## PuT Operational Indicators

- ✔ Line network length at territory: For each transport system, the links traversed by several lines of the transport system were counted several times for territories in the attribute 'Line network length (directed/undirected)'. Moreover, in the undirected variant, the entire link was used for the reverse direction instead of only the respective share in the territory. These bugs have been fixed. **(18860)**

## PuT Passenger Survey

- ✔ Performance problem with forced boarding or alighting: If boarding or alighting was forced at the start or end of the survey path leg, the plausibilization took considerably longer than without this option. This bug has been fixed. **(18421)**

## Scenario Management

- ✔ Freezing of the program when creating a scenario management project: If the local calculation service fails to start (e.g. when creating a scenario management project), Visum no longer freezes. **(18896)**

## Transfers Display of Regular Services

- ✔ Arrivals and departures after 24h: Arrivals and departures of a vehicle journey after a change of day were displayed in the transfers display of regular services at each hour. This bug has been fixed. **(18698)**

## Visum Files

- ✔ Deleting time series items with model transfer file: When applying a model transfer file in which time series items were to be deleted, an unwarranted error message was issued and the objects to be deleted continued to exist. This error has been fixed. **(18868)**

## ❗ Breaking Changes

### Data Model

- ❗ Consideration of switched off SC: If a signal control was switched off according to its properties, (main) nodes using this signal control were partly treated as signalized nodes anyway - especially in the ICA calculation. This error has been corrected. This changes the results of the ICA calculation and all assignments, as far as they use node impedances according to ICA, in particular the assignment with ICA. **(18854)**
- ❗ Line network length at main lines: The attribute 'Line network length (directed/undirected)' showed the sum of the corresponding attributes of the lines of the main line instead of the total length of all links of the main line, so that links used by different lines entered the attribute several times. This error has been corrected. **(18827)**
- ❗ Line network length at transport system and operator: At the network objects transport system and operator, the attribute 'Line network length (directed/undirected)' displayed the sum of the corresponding attributes of the lines with a suitable transport system or operator instead of the total length of all links travelled by these lines, so that links travelled by different lines entered the total several times. This error has been corrected. **(18861)**

### Other Procedures

- ❗ Signal offset optimization: A new version of the solution method has been added for the 'Signal offset optimization' procedure. This may change the results of the procedure. **(18869** [+](#))

### PrT Assignment

- ❗ Calculation error in fast variant of the blocking back model: The blocking back model provided incorrect results if the option 'Exploit capacities evenly (faster)' was active and only turn capacities, but no link capacities were taken into account. This error has been fixed. This combination is used in particular in assignments with ICA, the results of which change as a result. **(18183)**
- ❗ ICA calculation for capacity or saturation flow rate 0: A capacity or saturation flow rate of 0 was not handled correctly in the ICA calculation. This error has been fixed. This changes the results of the assignment with ICA. **(18890)**
- ❗ ICA calculation in assignments: When calculating an assignment, impedances at nodes are determined using the node impedance calculation according to ICA. If an error occurred during the calculation of the node impedances, the assignment itself was not canceled until now. This error has been corrected. As a result, assignment might be aborted in more cases. **(18850)**
- ❗ Skim matrix calculation for impedance in the stochastic assignment: It is possible to calculate a skim matrix for the total impedance within the stochastic assignment. This skim matrix contains components of the impedance defined over the entire path. The results of the stochastic assignment can change if the impedance component for the entire path results in an empty value. **(17670** [+](#))
- ❗ Speed-up: The evaluation of volume-delay functions has been accelerated. The shortest path search within the classical equilibrium and the incremental assignment, respectively, has been multithreaded. These modifications result in changes of the assignment results for the methods BFW, classical equilibrium, and the incremental assignment. **(16995** [+](#))
- ❗ VD function 'Akcelik2' at length 0: The VD function 'Akcelik2' returned  $t_{Cur} = 0$  at length 0. In particular, the travel time in the loaded network  $t_{Cur}$  may have been lower than the travel time  $t_0$  in the unloaded network for each turn. This error was corrected by issuing  $t_{Cur} = t_0$  at length 0. This changes the results of all PrT assignments when using this VD function. **(18820)**

### PuT Operational Indicators

- ❗ Line network length at territory: For each transport system, the links traversed by several lines of the transport system were counted several times for territories in the attribute 'Line network length (directed/undirected)'. Moreover, in the undirected variant, the entire link was used for the reverse direction instead of only the respective share in the territory. These errors have been corrected, which changes the corresponding indicators. **(18860)**

## + New Features and Changes

### ANM

- + Extended Vissim node preview: To better display the spatial extension of the node the Vissim node preview also includes neighboring nodes. **(17407)**

### Add-Ins

- + Use of formula matrices: In 'Calculate Matrix' formula matrices can be used as input matrices. **(17935)**

### COM-API

- + Better support in Python console: Working with PTV Visum via COM using the Python console is now much better supported. In particular, the Python console now includes autocompletion for the Visum object and all accessible Visum COM objects, help texts, tooltips for functions, and a help object that provides named numeric constants. In return, direct numerical indexing of network object containers is no longer possible. For example, `Visum.Net.Nodes[3]` must be replaced by `Visum.Net.Nodes.GetAll[3]`. In addition, code entered in the console is now always interpreted case sensitive. **(17898 !)**
- + Completion of the ItemByKey methods: The missing ItemByKey methods have been added to the container classes `ILineRouteItems`, `ITimeProfileItems`, `ISystemRouteItems`, `IVehicleJourneyItems`, `IBlockItems` and `IPathItems`. **(18615)**
- + Diverse changes in the COM-Interface: There exists a new method `VehicleJourneySections` at `INet`. The existing method `VehJourneySections` is marked as deprecated. The parameter `TableID` is optional for the methods `AddKeyColumns()` and `AddAllColumns()`. Equally, the method `AddDefaultColumns()` includes the optional parameter `TableID`. That means, that these methods are consistent and available for concrete tables. At `IAttribute` the method `PartOfKey` has been added. **(18243)**
- + New special function for links: It is possible to split intersecting links using this special function. A corresponding COM method has been added for `ILinks`. **(15453)**
- + Removal of incremental algorithm from MapMatcher: The incremental algorithm was removed from the `MapMatcher` and is no longer available. The global algorithm remains unchanged. The attribute 'Algorithm' is deprecated and will be removed in future versions. **(18386 !)**
- + Variables: The COM Interface has been extended to include variables. **(18319)**

### Data Model

- + Aggregation functions 'First' and 'Last': Relations using the aggregation functions 'First' or 'Last' can be edited like other 1:1 relations for editable attributes. **(18556)**
- + Attribute 'Volume' of connectors: The attribute 'Volume' with the subattributes `AHPI`, `PrTTSys` and `PuTWalk-TSys` has been removed. **(18010 !)**
- + Attributes of data type 'precise duration': The data type of several attributes has been changed to 'precise duration' to also display the unit of values. **(18069)**
- + Copying attributes: In the list of all attributes (ID 9712) it is possible to copy attributes using the entry 'Insert copy' from the context menu. Regular attributes can be inserted as user-defined attributes and user-defined attributes can be copied across network objects. **(14272)**
- + Maximum wait time for connecting journeys: The maximum wait time can be defined differently for reached and missed connections. **(18003)**
- + Network object planned connections: The new network object planned connection can be added between two vehicle journeys. A planned connection can have values for the guaranteed wait time and the probability how likely the connecting train will be reached. **(18604)**
- + New aggregation function: At 1:n relations the new aggregation function 'ExactlyOne' is available. **(18577)**
- + New attribute 'Post length direct': Line route items have a new calculated attribute that outputs the direct distance between the stop point of the current line route item and the stop point of the following line route item. **(17914)**
- + New relations from zone and main zone: New relations from the network objects zone and main zone, respectively, have been introduced to access the corresponding origin and destination (main) OD pairs. The standard aggregation functions of indirect attributes are available. **(5613)**
- + New relations: The relations from the line block version and line blocks to 'Network' have been added. **(18600)**
- + Relations with condition: For 1:n relations (one object to several objects) an additional condition can be set for aggregation functions. In these cases, the relation gives only objects for which the condition is fulfilled and the aggregation function is applied to those objects. Example: `'[SUM:INTURNS([TYPENO] = 2)\VOLVEHPRT(AP)]'` can be defined as formula for a link attribute. **(18387)**

- + Restriction of link type numbers: The restriction to 100 link types has been lifted. It is now possible to create and delete link types in the corresponding list. **(9998)**
- + Setting for PuT connections: Connections between services of the same line can be excluded by an option under network parameters. By default, the check box is ticked. **(18063 🚫)**
- + User defined Attributes: For further non-persistent network objects formula- based user defined attributes can be created. Additional non-persistent network objects are for instance Transfers, PuT Relation, PrT Assignment Quality or stop sequence items. Because these objects not always exists, only the formula definition of the user defined attribute is stored. **(18152)**
- + VDF-Number: The ID of the VDF-Number has been unified to 'NO'. This change affects the XML file of the procedure parameter file. **(18567)**
- + Wait and transfer time: In addition to the attribute 'Time', the list PuT transfer objects also contains its components 'Waiting time' and 'Transfer time' separately. **(18096)**

## Demand Procedures

- + EVA-Distribution/Mode choice: The demand procedue EVA-Distribution/Mode choice has been accelerated. **(16968)**

## Dialogs

- + Block item types: The dialog for PuT block item types has been replaced by a list. **(18351)**
- + Delete multiple nodes: It is now possible to perform the deletion recursive. Thus, additional nodes are deleted, which meet the criteria of the deletion after the first deletion process. The user has the option of switching this behavior on and off via a button. **(17643)**
- + Icons for text enlargement: The icons shown on different buttons are now displayed correctly even with text enlargement factors greater than 100%. **(13111)**
- + Line route editor: The line route editor is now available as a non-modal window. This means that multiple instances of it can be opened, and when editing the line route, other views can be opened and edited. **(17665)**
- + Parameterdialog timetable-based assignment: The parameter dialog of the procedure 'Timetable-based assignment' has been restructured. **(16194)**
- + Transport systems / modes / demand segments: The size of the dialog for editing transport systems, modes, and demand segments can be changed. **(17383)**

## Filters

- + Comparison of enumeration attributes: It is now possible to compare attributes containing enumeration values in filter conditions. For example, using the relation 'Reverse link', this allows to compare the transport system set of a link with the set in reverse direction. **(17640)**
- + Filters by network object: Filters can be loaded and saved, respectively, directly from the filter dialog. When loading filters from the filter dialog only filter settings for the corresponding network object are read. Filter settings for other network objects are skipped. **(4193)**

## Formulas

- + New functions available: The formula editor provides the new functions Modulo and integer quotient. **(17645)**
- + New functions available: The formula editor provides the new functions Sine, Kosine, Tangent, Arc sine, Arc cosine and Arc tangent. **(17839)**
- + Variables in formulas: Variables can be used in formulas. The functions 'String variable value("ID")' and 'Number variable value("ID")' have been added. **(18311)**

## Graphical Procedures

- + Flow bundles for Sharing: Sharing stations can be selected as network objects for PuT flow bundle conditions. **(15829)**

## Graphics

- + Draw Objects: The drawing and selection of objects can be controlled on the basis of content- related criteria. Thus, it is easy, for example, to display only the ten objects with the highest values in a selected attribute without using filters. **(17639)**
- + Graphic parameters of time-space diagram: The graphic parameters of the time-space diagram can be saved per view and also saved for several views of this type in the global layout. **(17886)**
- + High DPI support for text sizes in graphical output: If the operating system is set to a text size greater than 100%, corresponding scaled icons with higher resolution are displayed in the menu. **(18081)**
- + Line bars: Link bars of the type line bars have been extended by the aggregation level of line route items. This allows the classification according to attributes of the line route items. **(17648)**

- + Object selection: The graphic parameters offer the possibility of contextual selecting the objects to be drawn. The user selects the attribute that determines the drawing order and limits the number of objects to be drawn. **(17651)**

## I/O Interfaces

- + Attribute selection in railML-Import: The attribute lists for vehicle journey and line blocks in the railML-import dialog can now be restricted to attributes which are actually present in the source file. **(17921)**
- + Automatic creation of POI categories in Shapefile import: POI categories can now be created automatically based on the contents of the source field selected for the category number. This also allows POIs to be imported in non-additive mode. **(8910)**
- + Digits in field names of Shapefiles: Shapefiles containing field names starting with can now be imported. The names of the generated user-defined attributes get the prefix 'UDA'. **(10330)**
- + Export of multiple POI categories to Shapefile: Up to now it was only possible to either export all or one specific POI category to Shapefile. Now, any set of POI categories can be selected for exporting. The attributes available for the export are derived from the common super-category of the selected categories. **(11577)**
- + Export of routes: The routes of a PrT assignment can be exported for selected demand segments with the coordinates of all intermediate points being stored in the file. The routes saved in this file can be imported and matched to a Vissim network which spatially covers start and end points of these routes. **(18627)**
- + Extensions of the OSM import: The OSM import considers the number of lanes and the maximum speed of each direction of a link. **(18232)**
- + General transit feed (GTFS) - Import: The GTFS import has been extended, e.g. by the detailed route courses, and reimplemented. The import can be accessed via the menu File > Import. The corresponding Add-In 'Import General Transit Feed' has been removed. **(15118)**
- + Generation of additional route points in railML-Import: The options for controlling the creation of new route points along the route course during the railML-import have been refined and labeled more clearly. **(18651)**
- + Generation of line route items in RailML import: There is a new option to generate only line route items for stop points with time data. **(17923)**
- + Import of Public Transport supply: When importing Public Transport supply from another Visum network, the weights of various components of the target function are now exposed, allowing more fine-grained control over the matching process. **(14730)**
- + Import of pedestrian zones from OpenStreetMap: Ways tagged as 'highway=pedestrian' which usually represent pedestrian zones are now imported by the OpenStreetMap importer when using the import configuration 'Detailed Urban Network' **(18341)**
- + Link network in MaaS export: The MaaS export includes now links with their distance and as well travel times on links and turns per allowed exported transport system. The export contains three new files. Main nodes and main turns are being treated like additional nodes and turns. **(18501)**
- + Network topology in Shapefile import: Shapefiles containing links with invalid topology, e.g. with loops or parallel links between nodes can now be imported as links. The topology is restored during the import by inserting additional nodes on the invalid links. **(1431)**
- + PuT supply from Visum: For stop points the option 'Create directed stop points on links' has been added. **(14114)**
- + RailML import: Vehicle journey sections can now be imported as u',';daily'. Using this option all imported vehicle journey sections will be assigned the same valid day. This also allows to import data from railML into a network with non-overlapping calendar period. **(17924)**
- + Time information in railML: The priority for the time information of the ocpTT element can be defined by the user. **(17926)**
- + Vissim route export: The routes as a result of a PrT assignment can be exported. The corresponding route points are described by their coordinates. **(18533)**

## Installation

- + CodeMeter Runtime: The CodeMeter Runtime was updated to version 6.60a **(18498)**
- + Licensing: For academic packages, it is now possible to book out individual seats from the central network license to local computers for temporary offline usage **(18331)**
- + Technical license structure: In new licenses, add-on modules are no longer represented by individual license items, but are managed through the main product license item. **(18334)**

## Lists

- + Access to path lists: The access to path lists has been revised. Via the menu Lists > PrT paths and PrT path on link level, respectively, lists of paths from the assignment are opened. The menu entries Path set, Paths and Path items open lists of user-defined paths. **(18701)**
- + Attributes: A new list including all available attributes has been added which replaces the external file 'attribute.xlsx'. Optionally, only user-defined attributes can be shown, edited, created or deleted in this list. **(9712)**
- + Block item types: The dialog for PuT block item types has been replaced by a list. **(18351)**

- + Display of results for several demand segments: In the list PuT transfer objects, the results can be displayed for several demand segments that have been assigned together. **(17662)**
- + PuT Path Lists: The calculation of PuT Path Lists has been accelerated. **(18664)**
- + PuT shortest path search: The list of the PuT shortest path search can be synchronized with other views. **(18013)**
- + Sort: When sorting lists with many items, e.g. path lists, a progress bar and an option to cancel the process appear. **(12646)**
- + Sorting in path lists: Sorting is available in various path lists. **(16477)**
- + Variables: There are two lists for variables, one for the definitions and one for the values. In the list of definitions it can be determined which parameter of which procedure the variables represents. In the second list a value can be defined that is applied when the procedure is executed. **(18320)**

## Main Window

- + Direct selection of file type: The button to open files has been modified, so that a direct selection of the file type is possible, i.e. the dialog 'Select file type' is omitted. **(11831)**
- + High resolution: The display of menus and buttons on very high-resolution monitors has been further improved **(13152)**
- + Legends: The legends of different views (network editor, schematic line diagram, graphical timetable editor, transfer display of regular services) are integrated into the global layout file. **(17882)**

## Matrix Estimation

- + New options for 'Least squares': For the variant 'Least squares' it is possible to define OD deviations based on a historic demand matrix, i.e. the deviations of matrix values do not automatically refer to the current demand matrix. For the matrix estimation with several demand segments weights for OD deviations can be defined for each demand segment separately. **(18381)**
- + Warning in case of inconsistent demand matrix: A warning is shown, if the assigned demand matrix of a demand segment does not correspond to route volumes of the assignment. The reason is that this inconsistency results in wrong values of the flow matrix. **(18227)**
- + Dynamic matrix correction for SBA: The matrix estimation procedure 'Least Squares' has been extended by the time dimension. It can be applied to demand that has been assigned using the simulation-based dynamic assignment. **(16411)**

## Miscellaneous

- + Online-Help: The help files have been converted into HTML-5-format and is now available as browser-based online help. **(18473)**
- + Transfer display of regular services: The transfer display of regular services has been improved by multiple enhancements. Among other things it's now possible to display a legend; The line selection is now accessible via a shortcut and for the filters can now refer to the selected stop and time range. **(17659)**

## Network Editor

- + Changes of key attributes: Key attributes can be modified using the 'Multi-edit' functionality or the procedure 'Edit attribute'. The changes are subject to a review of conditions that must be met for key attributes. **(18009)**
- + Delete PuT valid days: In the dialog 'PuT valid days' a special function for deleting unused valid days is available **(18345)**
- + Diagrams and Tables: Diagrams and table of network objects are now freely positionable. They can still be aligned in general, but can now be moved individually. This offset is stored at the object. As part of this feature, the dialog for creating the tables has been modernized. **(18276)**
- + Editing geometries: Snapping points supports editing of geometries. As such points in addition stops, stop areas and stop points as well as polygon link points are available. Merging vertices of other geometries is displayed by a modified cursor (lasso) **(17667)**
- + Intersect: For the operation 'Intersect' the aggregation function 'Most important share' has been added. **(18549)**
- + New special function for links: It is possible to split intersecting links using this special function. A corresponding COM method has been added for ILinks. **(15453)**
- + Split links at surface boundaries: Using the corresponding special function it is possible to split links at boundaries of surfaces. Optionally, this can be done for different network objects with surfaces. The function can be accessed via COM. **(17666)**
- + Tabular rerouting of line routes: The dialog for the tabular rerouting of line routes has been extended and modernized. It now displays the number of trips that are already in use for each system route. The filter options within the dialog have been extended. **(17663)**
- + Treatment of stop points when merging links: There is no longer a warning if the relative positions of stop points become almost equal after merging two links **(18403)**

## Other Procedures

- + Headway offset optimization: The objective of the procedure 'Headway offset optimization' is the minimization of transfer waiting times. The procedure can be both integrated in the procedure sequence and executed in the timetable editor directly. As a result either the timetable is modified directly or model transfer files are generated. **(15974)**
- + Intersect with unique mapping: When using intersect a unique mapping can be enforced using the aggregation function 'Most important share' and an attribute that represents the rank. **(17668)**

## PrT Assignment

- + Convergence and additional iterations in SBA: In SBA convergence is only reached when all vehicles have left the network. If the maximum number of iterations is reached and not all vehicles have left the network, but this was the case in earlier iterations, additional iterations can be calculated until all vehicles leave the network. In these additional iterations the gap is not anymore considered to stop the assignment. **(18446 🚫)**
- + Default values for critical gap and follow-up gap of U-Turns in SBA: The default values for the SBA critical gap and the SBA follow-up gap of U-Turns have been modified. The new values are 6.0s and 3.0s, respectively. **(18700 🚫)**
- + Journey times for PrT paths: For user-defined PrT paths, journey times can be calculated for a given start time based on dynamic assignment results. **(18412)**
- + SBA: The simulation-based assignment has been accelerated. **(18196)**
- + WebTAG-compliant convergence criteria in assignment with ICA: WebTAG-compliant convergence criteria are available in assignment with ICA. These criteria can be chosen alternatively to the existing set of criteria. Basis for the implementation is the guidance 'TAG unit M.3.1 Highway Assignment Modelling', January 2014. **(17246)**

## Procedure Sequence

- + Introduction of variables: Variables have been introduced to replace parameters of procedures in the procedure sequence. The definition of the variables defines which parameter of which procedure the variable represents. The value of a variable is determined by the user and directly evaluated before the corresponding procedure is executed. Variables - definitions and values - are part of the procedure parameter file. **(18312)**

## PuT Assignment

- + Analyze risk of delay: With the new appraisal included in the timetable-based assignment it is possible to analyse impacts of delayed trains for passengers. Now indicators for the absolute delay and the share in passengers per connection, timetable element, transfers and destination alightings can be calculated. The input for this calculation is the in-time probability for every time profile item as well as a parameter of the delay's distribution. In addition it can also be considered how long a connecting journey can wait for a delayed previous journey and how probable it is to still reach the connection. **(17626)**
- + Flow bundle analysis with time restriction: For the flow bundle analysis a time restriction can be defined if the results of a timetable-based assignment are saved as connections. **(15629)**
- + Storage space for Public Transport paths: The memory footprint of Public Transport paths has been reduced through a redesign of the internal storage layout. **(18652)**

## PuT Line Blocking

- + Add-on line blocking with vehicle interchange: The scope of the add-on module 'LBVI' (detailed line blocking with vehicle exchange) has been modified. The module contains only functionality that is related to line blocking with vehicle exchange. Other functionality is therefore available in the add-on Line costing and revenue calculation. **(18653)**
- + Detailed Line Blocking: The consideration of optional multi-unit operation (by parallel journey sections) has been simplified by the introduction of the attribute 'is optional reinforcement'. It now executes the manual process described in the tutorial automatically. **(6116)**

## PuT Operating Indicators

- + Additional indicators for vehicle journey items: Additional indicators are now provided on the level of vehicle journey items: service time, section service time, service kilometers, section service kilometers and passenger hours. Combined with relations and aggregations in lists this allows very flexible evaluations. **(17638)**
- + The number of required vehicles (length-proportional and time-proportional) computed in the line blocking is now provided on the level of vehicle journey sections supplemental to vehicle journeys. **(18101)**
- + Unproductive times in the vehicle demand: The distribution of the required vehicle number now takes the unproductive times (standstills, empty runs,...) into account. This avoids that lines with short, but unfavorably located journeys are rated too low. **(15567)**

## Scenario Management

- + Comparison patterns: For the definition of comparison patterns global layout files are used. **(17730)**
- + Usage of variables: Variables can be used within the scenario management. If variables exist as part of a procedure set an additional column is created in the scenario grid (Tab Scenarios) where values of these variables can be edited. Via the button with the double plus sign several scenarios can automatically be created based on a range and step size of values of a variable. The result version of a scenario contains the value which has been used in the calculation of the scenario. **(18316)**

## Timetable Editor

- + Create vehicle journeys: While creating regular services, it is possible to assign specific attributes of the journey to the journey name. This is then previewed in the list at the bottom of the dialog. **(17650)**
- + Editing Timetable profile: If the departure or arrival time is fixed to a profile item, this setting is preset as a reference stop point when editing a timetable. If a journey whose timetable profile has a fixed profile item is assigned to a different time profile, an attempt is made to set this reference element. **(17238)**
- + Pasting timetable journeys from clipboard: Until now it was only being checked if all network objects of the pasted timetable journey's master data existed already. When the objects existed, they were referred to the pasted timetable journey. Otherwise a new object would have been created. Now in case of no suitable object it will be checked if there exists an object with the same key. If this is the case the user will be asked if he wants to use this object instead. The message window and settings can be controlled in the user preferences. **(17642)**
- + Stop Sequence: A function automatically sorts the stops sequence so that there are no zig-zags left, as long no zig-zags are created by this process at other stop sequences. **(17661)**

## Visum Files

- + Format of .puti files: The file format of .puti files for the import of PuT data has been changed to a XML-Format. Therefore, these files can now be edited, the extension .puti remains. **(11048)**
- + Introduction of variables: Variables have been introduced to replace parameters of procedures in the procedure sequence. The definition of the variables defines which parameter of which procedure the variable represents. The value of a variable is determined by the user and directly evaluated before the corresponding procedure is executed. Variables - definitions and values - are part of the procedure parameter file. **(18312)**

## Breaking Changes

### Data Model

- ! Attribute 'Volume' of connectors: The attribute 'Volume' with the subattributes AHPI, PrTTSys and PuTWalk-TSys has been removed. In version files from older release versions with lists that display these attributes, columns will be adjusted. **(18010)** +

### Dialogs

- ! Assignment of empty values: If a reference to another object is not mandatory an empty entry can be assigned. The replacement by empty values when reading version files from previous release versions can affect e.g. filter settings as well as results of aggregation functions. **(12038)**

### PrT Assignment

- ! Base critical gap for two-way stop: The calculation for the base critical gap of two-way stop intersections (HCM 2010 and later) was incorrect when the subject approach has two lanes and the opposing approach has three lanes. This error has been fixed. This changes the result of ICA for corresponding nodes as well as the results of assignment with ICA. **(18346)**
- ! Convergence and additional iterations in SBA: In SBA convergence is only reached when all vehicles have left the network. If the maximum number of iterations is reached and not all vehicles have left the network but this was the case in earlier iterations, additional iterations can be calculated until all vehicles leave the network. In these additional iterations the gap is not anymore considered to stop the assignment. This can result in a change of SBA assignment results. **(18446)** +
- ! Default values for critical gap and follow-up gap of U-Turns in SBA: The default values for the SBA critical gap and the SBA follow-up gap of U-Turns have been modified. The new values are 6.0s and 3.0s, respectively. Consequently, SBA assignment results can be affected. **(18700)** +
- ! ICA calculation in Assignment with ICA: If the ICA calculation within assignment with ICA is not possible the assignment will be canceled. Consequently, the assignment is canceled in more cases. **(18191)**

## COM-API



- ❗ Removal of incremental algorithm from MapMatcher: The incremental algorithm was removed from the MapMatcher and is no longer available. The global algorithm remains unchanged. The attribute 'Algorithm' is deprecated and will be removed in future versions. Scripts containing the algorithms do not work and should be adapted. **(18386 +)**

## Data Model

- ❗ Setting for PuT connections: Connections between services of the same line can be excluded by an option under network parameters. By default, the check box is ticked. This may result in changes of connections. **(18063 +)**

## PrT Assignment

- ❗ Output of queue length: The queue length of the blocking back calculation was output in number of vehicles instead of PCU. This error has been fixed. This can change the results of the blocking back calculation and the assignment results of assignment with ICA. **(18187)**
- ❗ Two-way stop control: Queue lengths may be different. **(18711)**
- ❗ User-defined SBA gaps: When overwriting SBA time gaps the values did not have any effect for turns which have a channelized turn defined. This error has been fixed. In addition, the tooltips for corresponding attributes have been improved. The change has an effect on SBA assignment results in models in which such node configurations with user-defined time gaps exist. **(16723)**

## COM-API

- ❗ Numerical indexing of network object containers: The improvements for code completion in the Python console required changes which prevent direct numerical indexing of network object containers from working - even when running scripts outside the console. For example, `Visum.Net.Nodes[3]` must be replaced in custom scripts by `Visum.Net.Nodes.GetAll[3]`. **(17898 +)**