PTV Visum 17 Release Notes

PTV **GROUP**

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http://vision-traffic.ptvgroup.com/en/support_visum

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17.01-17 [144474]

⊕ New Features and Changes

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)**

✓ Fixed Bugs

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)**

✓ 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)**

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)**

Graphical Procedures

✓ Flow bundle volumes at sharing stations wrong: In all flow bundle volume attributes (alightings, boardings, orign 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)**

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)**

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)**

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)**

PrT Assignment

- ✓ 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

- ✓ 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)**

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)**

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)**

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 with attribute files with non-existent subattributes: No more crashes when importing an attribute file containing an editable attribute with invalid subattribute ID. **(20106)**
- ✓ 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)**

17.01-16 [142093]   2019-04-23

⊕ New Features and Changes

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)**

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)**
- ✅ 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)**

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)**

Lists

- ✅ 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)**
- ✅ 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)**

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)**

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 ⚠)**
- 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 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)**

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)**

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

- 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 ✓)**
- 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 ✓)**

17.01-15 [140757]   2019-03-11

⊕ 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)**

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)**

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)**

Dialogs

✓ 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)**

Filters

✓ 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)**

✓ 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)**

✓ 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)**

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

✅ 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)**

Matrix Editor

✅ 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)**

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)**

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)**

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)**

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

✅ 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 ✓)**

17.01-14   [138660]   2019-01-15

⊕ New Features and Changes

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)**

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)**

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

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)**

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)**

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)**

✓ 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)**

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

Dialogs

✅ 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)**

✅ 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)**

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)**

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)**

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)**

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

✅ 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)**

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)**

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)**

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 🔴)**

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)**

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)**

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)**

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

- ✅ 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)**

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)**

🔴 Breaking Changes

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 ⊘)**

17.01-13 [137170]

⊕ New Features and Changes

Installation

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

⊘ Fixed Bugs

COM-API

- ⊘ 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)**
- ⊘ 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 particulary the effect of bars based on the current time interval was not visible. This bug has been fixed. **(10134)**
- ⊘ 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

- ⊘ 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. **(19375)**

Dialogs

- ⊘ 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)**

Formulas

- ⊘ Use of For Each statement: In same cases an infinite loop was initiates when using the For Each statement. This error has been fixed. **(19238)**

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)**

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

- 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)**

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)**

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)**

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

- 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 ✓)**

⊕ New Features and Changes

Network Editor

⊕ 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)**

✓ 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)**

Add-Ins

✓ Error messages in Add-In 'FareZone -> POI': If error messages occured 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)**

✓ New COM-IDs by mistake: PTV Visum 17.01-11 accidentally has a new COM-ID compared to the previous bugfix versions with the consequence that Visum had to be re-registered after the update. This bug has been fixed, i.e. PTV Visum 17.01-12 and subsequent versions of Visum 17 have the original COM-ID again. If PTV Visum 17.01-11 was registered after the update, PTV Visum 17.01-12 must be registered again after the update. If you have omitted version 17.01-11, you do not have to do anything. **(19038)**

✓ 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

✓ 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)**

✓ 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)**

✓ 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)**

✓ 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 editing line routes: No more crashes when editing line routes if a row that no longer exists (e.g. by shortening the line route) is selected in the dialog. **(18999)**

✓ 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)**

✓ 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)**

✓ 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)**

- 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)**

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

- 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 ⊘)**

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

- 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)**
- 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

- 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)**
- Thousands separator for shapefile export: When exporting shapefiles, the set thousands separator for text-based output was inadvertently taken into account. This resulted in shapefiles that could not be read again (in Visum and other applications). This error has been fixed. **(18781)**

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)**

Main Window

✅ GUI slow under Windows 10: The opening of dialogs or menus became very slow if many views were opened in Visum. The effect only occurred under Windows 10 and only with the current update status. This bug has been fixed. **(19027)**

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)**

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)**

✅ 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)**

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

✅ 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)**

✅ 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

✅ 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)**

✅ 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)**

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)**

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)**

- ✅ 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)**
- ✅ 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)**
- ✅ 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)**

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)**
- ✅ 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)**
- ✅ 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

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

- ⛔ 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 ✅)**

17.01-11 [133376]   2018-07-31

⊕ New Features and Changes

COM-API

- ⊕ 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)**

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)**

Network Editor

- ⊕ 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)**

PuT Assignment

⊕ Faster headway-based assignment: The headway-based assignment has been slightly accelerated. **(14956)**

✅ 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

✅ 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 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)**

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)**

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)**

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)**

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)**

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)**

Other Procedures

- ✅ 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 🔴)**
- ✅ 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 🔴)**
- ✅ 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 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)**

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)**
- ✅ 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

Data Model

- 🔴 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 ✅)**

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** ✓**)**
- ⊘ 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** ✓**)**

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** ✓**)**

17.01-10 [132809]	**2018-07-11**

⊕ New Features and Changes

Installation

- ⊕ Icons in Windows Explorer context menu: The relevant menu items in the context menu of the Windows Explorer for version files now show the proper Visum icons. **(18779)**

Network Editor

- ⊕ 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)**

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)**

Visum Files

- ⊕ Dragging graphic parameters files to Visum: If a graphic parameters file (*.gpax) is dragged onto the Visum window, the contained graphic parameters are no longer always applied in the network editor but, depending on the hit window, in the network editor or in an open 3-D network view. **(17775)**

✓ Fixed Bugs

Add-Ins

- ✓ Barriers in 'Create PuT Zone Connectors': If POIs of a category are used as barriers in the 'Create PuT Zone Connectors' add-in, an error message could occur in certain cases. This bug has been fixed. **(18391)**

COM-API

- ✓ Get obsolete attribute via COM: If the value of an obsolete attribute is queried via the AttValue property of a COM object, there was no error message, nothing happened at all. This error has been fixed by now returning a COM error. **(18449)**

Data Model

- 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** 🛑**)**

Dialogs

- Class names for classification in graphic parameters: The class names of the individual classes of a classified display were no longer automatically adjusted to changed class limits in all graphic parameter dialogs. Resetting the class names via the shortcut menu also no longer worked. Both bugs have been fixed. **(18692)**
- Classified bars: In the 'Edit bars' dialog you could not change the class limits of a classified bar. This bug has been fixed. **(18741)**
- Crash in case of invalid entry in 'Maximum bar width': No more crash after entering an invalid value in the 'Maximum bar width' field in the 'Edit bar' dialog. **(18767)**
- Edit / create POI: If a value too high was specified as POI number when editing or inserting a POI, the warning message 'Enter an integer' was issued instead of indicating the actual limits of the possible value range. This bug has been fixed. **(18773)**
- Graphic parameters of bars: In the 'Edit bars' dialog, the format for the scaling limits was no longer correctly adapted to the attribute type. This bug has been fixed. **(18785)**
- Incorrect entries in 'Edit bar' dialog: If you entered an invalid value in an input field of the 'Edit bar' dialog, this was not pointed out when changing the dialog page, but only when entering values on a different page. However, the incorrect value was then no longer visible. This bug has been fixed. **(18769)**
- Path selection buttons in 'Edit project directories': The default width of the file selection button (...) in the 'Edit project directories' dialog was too large and was reduced. **(18634)**

Graphics

- Screenline labels: Screenline labels were also drawn if the 'Draw labels' option in the graphic parameters dialog was disabled, but the 'Draw object' option was selected under 'Display'. This bug has been fixed. **(18552)**

I/O Interfaces

- railML export creates non XML-compliant files: Exporting a railML file created a file that did not comply with the rules of an XML file. In particular, these files could not be re-imported by Visum. This bug has been fixed. **(18825)**

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)**

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)**
- Unwanted marking of all line routes: If you clicked a stop point A in the 'Edit: Line Routes' mode in the network editor and then a stop point B while holding down the CTRL key, all line routes that touched A first and then B were marked. However, if there was no such line route, all line routes in the network were marked instead of none. This bug has been fixed. **(18569)**

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)**

PrT Assignment

- 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)**
- Vehicle hours travelled tCur after LUCE assignment: In the 'PrT assignment quality data' list, the value of the attribute 'Vehicle hours travelled tCur' was displayed in the attribute 'Vehicle hours t0' 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)**
- Prefactor of the origin wait time in speed-optimized headway-based assignment: The prefactor of the origin wait time was used incorrectly in the impedance definition in the speed-optimized headway-based assignment. This error has been fixed. **(18735)**
- Sharing results discarded in PrT assignment: Up to now results at sharing stations (occupancy and relocations) were discarded when calculating or initializing a PrT assignment. This bug has been fixed. **(18747)**
- Skim calculation for undefined attribute: If an attribute whose value is undefined is selected for the calculation of the 'Attribute for path leg skim', the calculation is now canceled. This applies in particular if assignment and skim calculation are executed in the same procedure step and an output attribute of the assignment is selected as the source for the skim calculation. To enable this, assignment and skim calculation must be carried out in separate steps so that the attribute value is already defined at the beginning of the skim calculation. **(18758)**
- 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)**
- Walk links in the speed-optimized headway-based assignment: The speed-optimized headway-based assignment did not correctly take into account the general procedure setting 'Walk links from/to connectors', i.e. even if walk links between zones were prohibited, they were found in the assignment. This bug has been fixed. **(18575)**

PuT Line Blocking

- Misleading message about empty trip at the same stop: If there is a link stop point in the network, which is also the start or end point of a vehicle journey section, and if the insertion of empty trips is permitted during line blocking, an error message could occur that no path existed from this stop point to itself. This fact is irrelevant for line blocking, therefore this message is no longer issued. **(18724)**

PuT Passenger Survey

- Skims per analysis time interval in direct assignment: In direct assignment, skim matrices cannot be calculated per analysis time interval. If the corresponding option was activated, it crashed instead of refusing execution. This bug has been fixed. **(18685)**

Scenario Management

- Flow bundle in comparison pattern: No more crash when finishing a comparison pattern if flow bundle terms were added while editing it in scenario management. **(18771)**
- Password for database in plain text: The 'Edit database connection' dialog in scenario management displayed the password for the database connection in plain text. This bug has been fixed. **(18787)**

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

- Fault-tolerant handling of procedure parameters in version file: If the import of the procedure parameters during the import of a version file failed, the complete version file could no longer be imported. This error has been fixed by now importing all other components of the version file except the procedure parameters (i.e. the actual network data, window configuration, graphic parameters etc.) anyway. **(18680)**

- ⊘ Invalid characters in XML files: Characters invalid in XML were not filtered out when writing XML files (e.g. procedure parameters or graphic parameters). This could result in unreadable files (including version files). This bug has been fixed. **(18682)**

⊘ Breaking Changes

Data Model

- ⊘ 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 ⊘)**

17.01-09 [131910]	2018-06-12

⊕ New Features and Changes

I/O Interfaces

- ⊕ Character set for shapefile import: If a CPG file specifies the character set of the shapefile as UTF-8 when importing a shapefile, the shapefile is now read as UTF-8-encoded file. **(13570)**
- ⊕ Non-ASCII characters in shapefile export: Strings are now written in UTF-8 format during shapefile export. In addition, a *.cpg file specifying this character set is created. Systems that do not interpret this file do not experience any deterioration, because the import as ASCII character set continues to function if de facto only characters from this character set occur. **(14812)**
- ⊕ Statistics for railML import: After the railML import has taken place, a statistic is displayed in the message window which allows an overall assessment of the import process even with large amounts of data and a correspondingly large number of messages for individual vehicle journeys. **(17078)**

Main Window

- ⊕ Decimal separator and thousands separator: The settings for decimal and thousands separators in the user preferences are now taken into account in additional places, for example for numbers in the status bar and for displaying the number of lines in the upper left corner of lists. **(17142)**

PuT Assignment

- ⊕ Acceleration of fare calculation: The calculation of fares according to the fare model has been accelerated. **(18654)**

Timetable Editor

- ⊕ Extent of vehicle journeys when changing the time profile: If, in the timetable editor, several vehicle journeys are moved to a different time profile than previously via the 'Edit vehicle journeys' dialog by selecting a different line, line route and/or time profile, the spatial extent of those vehicle journeys whose start and end stops are stops in the new time profile is now retained. **(17237)**

⊘ Fixed Bugs

COM-API

- ⊘ Error messages not issued: In some methods, messages were generated in the event of an error, but not issued as COM errors at the end. As a result, the method call appeared to have run correctly even though the desired purpose was not achieved. This error has been corrected. **(18396 ⊘)**

Data Model

- ⊘ Aggregation functions for set attributes: Indirect attributes for which a set-valued attribute (for example TSysSet) was accessed via a multi-relation using an aggregation function did not return any values when the minimum or maximum aggregation function was used. This error has been fixed. **(18694)**
- ⊘ Compensate negatively oriented faces: If a face element was oriented negatively but did not represent an enclave according to the data model, so far, this contradiction was not resolved. As a result, the entire face could disappear if the face was changed, e.g. in the network editor. This error has been corrected, i.e. the marking as enclave now has a stronger effect than the orientation of a face, and the face is adjusted if necessary after insertion. **(18508)**

- Operating day and forced chaining: The attributes 'Operating days code', 'Operating days name' and 'Forced chain on vehicle journey section' depended on the add-on module 'LBVI' (= line blocking with vehicle interchange) for no reason and were therefore not visible without this module. This error has been fixed. **(18683)**

Dialogs

- 'Use fare zone type' depending on fare structure: The option 'Use fare zone type' in the 'Edit ticket type' dialog is no longer switchable depending on the selected fare structure if it is irrelevant for the selected fare structure (because fare zone types always or never take effect in the fare structure). **(18622)**
- Numbers for 'Delete multiple nodes': In the 'Delete multiple nodes' dialog, the number of nodes to be deleted did not update when switching on or off the options for isolated, single-leg or multi-leg nodes. This bug has been fixed. **(18455)**

Formulas

- Matrix reference with a calculated expression in the condition: If, in a matrix reference, there is neither a constant nor an attribute value on the right side of a condition but an expression to be calculated (e.g. 'Matrix([NO] = 1+1)' instead of 'Matrix([NO] = 2)', the matrix reference was not always resolved correctly, especially if a suitable matrix did not yet exist. This error has been fixed. **(18456)**

Graphics

- 'Avoid overlapping when drawing' for passive point objects: If the option 'Avoid overlapping when drawing' was activated for point objects of a type and passive objects were also displayed, passive objects had priority over the active objects in case of conflict. This bug has been fixed. **(18201)**

Lists

- Thousands separator for negative numbers: For negative numbers, the thousands separator was already displayed in lists if the number had only three digits. This error has been fixed. **(18693)**

Network Comparisons

- Change of network object reference type of a matrix via model transfer file: Until now, it was not possible to change the network object reference type of a matrix using model transfer files: a corresponding file could be created, but an error message was displayed during use. It is now possible to switch by saving the respective matrix as deleted and newly inserted into the model transfer file during the difference calculation (values of the matrix do not last the change of the network object reference type anyway). **(18690)**

Other Procedures

- Origin wait time for transport with DRT outside of the AP: If the departure of the DRT path leg was outside the analysis period (e.g. for a pickup after 24:00) in the 'Tour planning' procedure or for import from PTV MaaS Modeller, the displayed origin wait time at the PuT path was too long. This error has been fixed. **(18489)**

Procedure Sequence

- 'Go to' only up to procedure 999: The procedure 'Go to the procedure' could only return to procedure steps with numbers up to 999. This error has been fixed. **(18616)**

PuT Assignment

- Mean volume to total capacity ratio at time profile: The attribute 'Mean volume to total capacity ratio' at the time profile was calculated on the basis of the seats and not the total seats. This error has been fixed. **(18755)**
- No shortest paths for specific transition times between lines: In the timetable-based assignment in the variant with shortest path search, connections were not found if they used specific transition times between lines and directions. This error has been fixed. **(18648)**
- Search parameters for PuT-Aux transport systems were lost: If values for PuT-Aux transport systems were specified in the term 'Transport system impedance' within the search parameters for the Branch & Bound search of the timetable-based assignment, these values were lost when saved and later read in as version files or procedure parameters files. This bug has been fixed. **(18633)**
- Storage space required for relation-based analysis: The 'PuT relation-based analysis' procedure required an unnecessary amount of memory if the assignment result contained a large number of PuT paths. This error has been fixed. **(18650)**

PuT Line Blocking

- Layovers after forced chaining passing midnight: An unnecessarily long layover occurred during the formation of blocks under consideration of forced chainings if a forced chaining connected a vehicle journey section before midnight with a vehicle journey section past midnight. This error has been fixed. **(18647)**

PuT Passenger Survey

- Display of non-plausible paths in the list: The attributes 'Standardized arrival time' and 'Standardized departure time' in the PuT path list and in the PuT path legs list displayed the value 14:53:52 for non-plausibilized or non-plausible routes instead of an empty value. This error has been fixed. **(18519)**
- PuT operating indicators based on survey data: If, in a procedure sequence, a procedure step 'PuT operating indicators' was executed after a direct assignment of survey data (on which it was based), the transport performance indicators were not evaluated. This error has been fixed. **(18691)**

Scenario Management

- Crash when calculating several scenarios locally: Crashes of additional computing instances of Visum no longer occur if several scenarios are calculated locally (i.e. not on a different computation node) from the scenario management dialog. The crash of such calculation instances itself often went unnoticed, but the calculation was then performed with fewer instances than specified in the user settings. **(18630)**

Schematic Line Diagram

- Response to 'Undo': If changes were made to the timetable data which resulted in vehicle journey items of an edge no longer being displayed in the schematic line diagram (e.g. deleting the vehicle journey), an incorrect layout of the schematic line diagram could occur when this action was undone. This error has been fixed. **(18649)**

Timetable Editor

- Crash triggered by 'Undo' after inserting vehicle journeys from clipboard: No more crash if the last two actions are undone after inserting a vehicle journey from the clipboard into the timetable editor. **(18611)**

Transfers Display of Regular Services

- Selecting a date for an annual calendar: When selecting a date for the start or end of the displayed period in the transfers display of regular services in a network with an annual calendar, the date selection closed as soon as you switched the month. This bug has been fixed. **(18645)**

Visum Files

- Import attribute definitions for POI categories from network file: No more crash when additively reading a network file containing a user-defined attribute for a POI category if a user-defined attribute with the same ID but a different value type already exists in the network at a parent POI category. **(18697)**
- Import of procedure parameters file with reference to missing POI category: The import of a procedure parameters file was aborted without a message if the imported procedure sequence contained a procedure step 'Edit attribute', which referred to a POI category that did not exist in the network. This error has been corrected by skipping the affected procedure step and pointing out this circumstance. **(18515)**

⊘ Breaking Changes

COM-API

- Error messages not issued: In some methods, messages were generated in the event of an error, but not issued as COM errors at the end. As a result, the method call appeared to have run correctly even though the desired purpose was not achieved. This error has been corrected. If such a case occurs in a script, the behavior changes because the previously implicitly ignored error must now be handled explicitly in the client code. **(18396 ⊘)**

17.01-08 [130895]   2018-05-03

⊕ New Features and Changes

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, it is now imperative that the entry is case-sensitive. **(18551)**
- ⊕ New auxiliary function 'ArrayNoneToZero': A new auxiliary function 'ArrayNoneToZero' in the library VisumPy.helpers allows the conversion of empty values into the numerical value 0 in arrays returned by the method GetMultipleAttributes. **(17831)**

Network Editor

- ⊕ Passenger trip chains when aggregating and combining line routes: When aggregating and combining line routes as well as when moving stops in the network, chained up vehicle journey sections (i.e. chained up vehicle journey sections or forced chainings) are now obtained. **(18430)**

Other Procedures

- ⊕ Trip request generation same as in PTV MaaS Modeller: The generation of trip requests in PTV Visum now generates the same trip requests as in PTV MaaS Modeller when using the same input parameters. **(18576)**

PuT Assignment

- ⊕ Calculation of vol/cap ratio-dependent impedance accelerated: The calculation of the vol/cap ratio-dependent impedance in the timetable-based assignment with capacity restriction was accelerated. This is particularly effective when performing the second connection search in an already loaded network. **(18503)**

✓ Fixed Bugs

COM-API

- ✓ ILineRouteItems.MakeRoutePointsTimeProfileItems method extremely slow: The execution of the MakeRoutePointsTimeProfileItems COM command at the ILineRouteItems object was extremely slow, especially compared to the interactive creation of profile points using Multi-edit. In addition, messages were not suppressed during execution. These two errors have been fixed. **(18530)**
- ✓ Project directory for shapefile import and export: When importing and exporting shapefiles via COM (IIO.ImportShapefile or IIO.ExportShapefile), the set project directory for shapefiles was not considered if a relative path was specified as file name. This bug has been fixed. **(18453)**
- ✓ Running the GPX import: The GPX import (method IIO.ImportGPX) could only be run if all references to network objects of the loaded network had been released, although this condition is not necessary. This error has been fixed. **(18525)**

Data Model

- ✓ Decimal separator when setting WKT strings: When setting the value of a WKT attribute, the decimal separator was removed in the existing y-coordinates if the y-coordinate had exactly three decimal places. This error has been corrected. **(18506)**
- ✓ Node geometries after opening links for PuT-Walk transport systems: Node geometries could be damaged when opening a link for a transport system of the type PuT-Walk. This bug has been fixed. **(18192)**

Dialogs

- ✓ Copy and paste in the procedure parameters dialog of EVA weighting: If a constant was copied in the column 'SkimMat / ZoneAttr / LinComb' in the procedure parameters dialog of the 'EVA weighting' procedure and pasted into another cell of the column, a 0 was always inserted instead of the copied value. This bug has been fixed. **(18613)**
- ✓ Crash when editing line and path bars: No more crashes when opening the edit dialog for a line or path bar via the button in the graphics parameter dialog (Link - Bars - Display page) if the same dialog had previously been opened by clicking in the Filling cell within the table. **(18521)**
- ✓ Tooltip in the walk times matrix: In the 'Edit stop' dialog, the tooltip with the names of the respective stop areas was missing on the 'Walk times stop areas' page above the row and column headers of the walk times matrix. This error has been fixed. **(18579)**
- ✓ Width of the attribute selection dialog: Once you enlarged an attribute selection dialog, it could not be reduced again the next time it was opened. This bug has been fixed. **(18573)**

Filters

- PuT path filter and bars: No more crashes when changing a filter condition on the 'PuT paths' tab of the OD pair filter if the 'Filter network volumes' option is activated and bars representing these filtered volumes are displayed in the network. **(18592)**

Formulas

- Preselection for analysis time slots in the formula editor: When an attribute is inserted as an operand in a formula, the default settings for analysis time slots made in the user preferences are taken into account in the attribute selection dialog that is then displayed. However, this setting could not be overridden in this particular dialog, that is, it was not possible to select an analysis time slot other than the default one. This error has been fixed. **(17647)**

Graphics 3-D

- Classification of POIs in the graphic parameters: If POIs of a certain category (possibly with subcategories) were displayed in a prism display in the 3-D network view and these were either classified or displayed as height bands, and if a user-defined attribute of the POI category was used for the classification, then the action 'Redefine all classes' could not generate any reasonable classes. This error has been fixed. **(18157)**

I/O Interfaces

- Check when exporting to MaaS Modeller: When exporting to MaaS Modeller, only those relations are now checked for too large or invalid values in the skim matrix for which there is demand and whose origin and destination zones occur in a PUDO scheme. The program also checks whether there are PUDO schemes without nodes or service areas without zones. **(18570)**
- Select source file manually for PuT Updater: If the source file was selected manually in the import parameter dialog 'PuT supply from Visum' on the page 'Basic settings' instead of via the file selection dialog, this newly selected source file was not considered. In particular, the transport systems contained therein were not retrieved and offered for allocation to the existing transport systems in the target network. This bug has been fixed. **(18580)**
- Very large distances in HAFAS import: The import of HAFAS data was canceled without a result, if links with an extremely long length (a multiple of the earth's circumference) were generated due to incorrect indication of the co-ordinates of the stops. This bug has been fixed. **(16735)**

Junction Editor

- Project directories for RBC controllers: RBC controllers are not external controls, but their data are part of the Visum data model. However, an error message suggested that the project directory would be used for 'External controls'. This bug has been fixed. **(18492)**

Lists

- Changing the reference object of synchronized lists: Changing the reference object (e.g. line route in the line route items list) of a synchronized list failed if the previous reference object was included in the global selection, especially if you had already changed the reference object before. This bug has been fixed. **(18524)**
- SBA results and PrT path links list: No more crashes when displaying the attribute Volume (and some other output attributes) in the 'PrT path links' list if the network contains paths assigned with the simulation-based dynamic assignment (SBA). **(18401)**

Matrix Estimation

- Demand matrix correction after PuT assignment with MPA: No more crashes when executing a demand matrix correction for a PuT demand segment if a PuT assignment with MPA was calculated for this demand segment. **(18602)**

Network Editor

- Reallocating links: When reallocating a link from one node to another, in certain cases permitted transport systems were also removed from turns at nodes other than the former and the new end node of the reallocated link. This bug has been fixed. **(18490)**

Other Procedures

- Length of PrT paths through main nodes: If a user-defined PrT path passed through a main node, the length indicated in the 'Length' and 'Length polygon' attributes previously also contained the length of the link between the two used cordon nodes of the main node. This also affected:
  - the length attributes of PuT path, PuT path leg, PuT OD pair and PuT overall statistics if path legs are covered by DRT transport systems
  - the length-based skims in-vehicle distance and journey distance.
  This error has been fixed. **(18598 ⛔)**

PuT Assignment

✅ Boardings at stops with passenger trip chains: If paths were only saved as routes and not as connections (General procedure settings), passengers following a passenger trip chain were counted as boarding passengers at the stop of the beginning vehicle journey. This bug has been fixed. The 'Passengers alighting' attribute was not affected. **(18293)**

✅ Crash in timetable-based assignment with iterations and skims: No more sporadic crashes when executing the timetable-based assignment with iterations (i.e. with capacity restrictions or with Sharing transport systems) if skim matrices are calculated in the assignment. **(18542)**

✅ Headway-based assignment with service frequency: No more crash during the execution of the headway-based assignment in certain cases where the speed-optimized variant is used for the information level 'Optimal Strategies' and at the same time the service frequency is calculated. **(18514)**

✅ Sharing trips with interlining: Infinite loops no longer occur in timetable-based assignments in certain cases when one of the sharing transport systems used permits interlining of the sharing vehicles. **(18608)**

Scenario Management

✅ Key administration during network change: If the network was changed while editing a modification or the base version, for example by opening a different version file as a new target state, the resulting maximum key values were not determined correctly afterwards. As a result, when new objects were inserted during subsequent editing steps, the proposed key might already be used in a modification other than the one currently being edited. This bug has been fixed. **(18251)**

Visum Files

✅ Changing transfer walk times by additive import of network files: If general or special transfer walk times at stops were changed during an additive import of a network file, the previously valid values for walk links continued to take effect within the PuT assignment. Only after saving the network as a version file and reading it in, the new walk times took effect. This bug has been fixed. **(18535)**

✅ Version file with trivial DRT path legs: Crashes no longer occur when opening a version file which contains at least one PuT path with a DRT path leg where the From- and To-PrT path elements are the same. **(18617)**

⛔ Breaking Changes

Other Procedures

⛔ Length of PrT paths through main nodes: If a user-defined PrT path passes through a main node, the length indicated in the 'Length' and 'Length polygon' attributes previously also contained the length of the link between the two used cordon nodes of the main node. This also affected:
- the length attributes of PuT path, PuT path leg, PuT OD pair and PuT overall statistics if path legs are covered by DRT transport systems
- the length-based skims in-vehicle distance and journey distance.
This error has been fixed. This changes the skim matrices and results calculated with PTV MaaS Modeller using the Tour planning procedure. **(18598 ✅)**

17.01-07 [130034] 2018-04-04

➕ New Features and Changes

Dialogs

➕ File selection HAFAS timetable files: The dialog for selecting the HAFAS timetable files is now resizable. You can also select several related files in the list by clicking and holding down the Shift key. **(18477)**

➕ HAFAS projects with relative paths: In the parameter dialog for the HAFAS import, all files can now also be selected with relative paths. More precisely: If the selected file is in the project directory set for 'Other input data' or a subdirectory thereof, the file name is applied as the relative path from the selected project directory. Of course relative paths can also be entered directly in the table. **(16100)**

Graphics 3-D

➕ Fog in DirectX: Even when using the DirectX graphics interface, the transition between horizon and sky is now displayed smoothly ('fog'). **(18399)**

- ⊕ Switchable antialiasing: For 3-D display, the antialiasing function can now be activated via a user setting, which is particularly useful at low resolution. **(18436)**

I/O Interfaces

- ⊕ New format in *L row for HAFAS import: In the HAFAS import, line names extended to 8 digits can now also be read from *L rows in the timetable file, which are permitted in raw data format since version 5.20.19. **(16663)**

I/O Interfaces, Other Procedures

- ⊕ Passenger data at PrT paths after import from PTV MaaS Modeller: After importing a tour plan from PTV MaaS Modeller and after executing the 'Tour planning' procedure, data of the transported trip requests are provided at the PrT path items with profile point property of the (vehicle) paths, more precisely: an attribute expresses the occupancy on the section up to the next profile point and relations are provided to the boarding, to the alighting, and to the onboard trip requests on the following section. **(17901)**

PuT Assignment

- ⊕ Acceleration with Branch & Bound: The timetable-based assignment with Branch & Bound search was slightly accelerated. **(18493)**

✅ Fixed Bugs

Dialogs

- ✅ Crash when changing the printer: A crash no longer occurs when changing the printer in the print dialog, if the number of available papers in the newly selected printer differs from the number of available paper sizes. **(18435)**
- ✅ Drawing bars for links and connectors: The options 'Draw bars' and 'Draw bar labels' on the 'Layer control' tab of the 'Connectors > Bars' page of the graphic parameter dialog of the network also affected links. This bug has been fixed. **(18189)**
- ✅ Formula field in parameter dialog of 'Edit attribute': After opening the parameter dialog of the 'Edit attribute' procedure, the input field for the formula was initially invisible until the dialog was moved or resized. This bug has been fixed. **(18239)**
- ✅ Second language in license dialog: The second language set in the license dialog was no longer taken into account after exiting and restarting Visum. This bug has been fixed. **(18491)**
- ✅ Swap classes for bar fillings: A crash no longer occurs when changing a classification for the filling of bars in the graphic parameters if one of the middle class limits is changed so that the order of the classes changes. **(18158)**

Graphic Procedures

- ✅ Time reference for PuT isochrones: If a calendar was set in the network, with each selection of a network object for the isochrones calculation the data for the From- or To-day of the period for the PuT isochrones was overwritten by default values. This error has been fixed. **(18369)**

I/O Interfaces

- ✅ Line route not inserted during railML import: Under certain circumstances no path was found between consecutive specified stop points (and the line route was not inserted) during a railML import, although the insertion of direct links was selected as an option in case of a path not found and the affected stop points were located on nodes. This error has been fixed. **(18445)**

Lists

- ✅ Crash when accessing trip requests: A crash no longer occurs when exporting a PuT path leg list if indirect attributes of trip requests are used in the list. **(18507)**

Matrix Editor

- ✅ Projection variants for matrix operation 'Projection by territory': In the matrix operation 'Projection by territory', the selected projection variants were misinterpreted. This error has been fixed. **(18480)**

Other Procedures

- ✅ Canceling tour planning in PTV MaaS Modeller: If the 'Tour planning' procedure was aborted, the resulting calculation continued in PTV MaaS Modeller. This bug has been fixed. **(18454)**

- Memory requirements of the PuT relation-based analysis: The memory requirements of the 'PuT relation-based analysis' procedure have been reduced, especially in the case that only the active time profiles are taken into account. **(18433)**

PrT Assignment

- Output attributes for convergence in assignment with ICA: The convergence attribute 'ASSIGNICAMAXRELDIFFVOL', optionally saved in the assignment with ICA, contained incorrect values. This error has been corrected. **(18303)**
- Unstable results for LUCE in networks with main nodes: The PrT assignment procedure 'LUCE Equilibrium assignment' provided different results when repeatedly executed on networks with main nodes and using Nodes VD functions. This bug has been fixed. **(18389)**

Procedure Sequence

- Deselect demand segment for skim matrix: If the timetable-based variant was selected for a PuT assignment procedure step and several demand segments were assigned, for each of which the skim matrix calculation was also activated, and one of the demand segments was then deselected in the procedure sequence without subsequently opening the dialog again, the assignment could not be executed. This error has been fixed. **(18408)**

PuT Assignment

- Assignment crashes after import of a connection file: No more crashes in the timetable-based assignment taking fares into account if the connections do not originate from the search but from an imported connection file (*.con) in which fares are specified per path leg and demand segment. **(18418)**

PuT Operating Indicators

- Vehicles required for vehicle journeys not fully covered: If the analysis period consisted of several days and at least one vehicle journey section was only scheduled for some of these days in a block, the attributes 'Number of vehicles (length-proportional)' and 'Number of vehicles (time-proportional)' delivered values that were too large at the various objects of the line hierarchy. This error has been fixed. **(18510)**

Safety

- Missing node allocation during generation of sections: In certain cases node allocations were not created when sections were generated automatically. This bug has been fixed. **(18483)**

Subnetwork Generator

- Termination in case of active but closed links: When cutting a subnetwork with the option 'Generate all possible PrT cordon zones', the operation was aborted if passive links existed along PrT paths with an opposite direction that was active but closed for all transport systems. This error has been fixed. **(18474)**

Timetable Editor

- Reading in version files with a complex stop sequence: Reading a version file with a stop sequence where many line route items are assigned to the stop sequence items took too long and was accelerated. **(18481)**

Visum Files

- Shortest path search when importing attribute files for links: When importing attribute files for links, it is possible to assign the values of links not found to other links using a shortest path search. This allocation did not work when the number of the links was available as a column in the attribute file to be read. Furthermore, when you repeatedly entered the parameter dialog for this shortest path search, the previously set parameters were not displayed again. Both errors have been fixed. **(18450)**
- Stop area walk times from attribute file: When importing an attribute file with passenger transfers and stop area walk times, the program did not check whether the specified From- and To-stop area belonged to the same stop. As a result, data was transferred to transition relations other than those intended. This error has been fixed. **(18427)**

17.01-06   [129210]   2018-03-02

⊕ **New Features and Changes**

Dialogs

- Indentations in the script code for 'Run script': The script code in the procedure parameter dialog of the 'Run script' procedure now uses a font with a fixed width for all characters to better recognize the indentations in the Python code. **(16231)**

Graphics 3-D

- Request better graphics card: On systems with several graphics cards (usually an energy-saving onboard and a high-performance additional graphics card, often on notebooks), the more powerful graphics card is now automatically requested for Visum, so that a 3-D display is possible without any special setup of the system. **(17160)**
- Use of DirextX as 3-D graphic interface: In the user preferences, you can now select DirectX as graphic interface instead of OpenGL. In particular, this technology also works via remote desktop connections and in some cases where OpenGL does not work (and vice versa). **(18075)**

Installation

- Python module 'Requests' in the installation: The Python module 'Requests' is now part of the included Python installation. **(18082)**

Network Editor

- Improved in-place editing of the legend: The in-place editing of the legend in the network editor has been improved in many respects with an emphasis on the usability of the mini toolbar. **(18074)**

✅ Fixed Bugs

COM

- Inserting a scenario: No more crashes if the insertion of a scenario (via IProject:: AddScenario) into an existing scenario management project fails. **(18394)**

Demand Procedures

- Completion message for mode choice: The final message of the 'Mode choice' procedure within the framework of the 4-step demand model issued the same share for each mode. This error has been fixed. **(18415)**

Dialogs

- Mouse pointer in the print dialog: In the print dialog, the mouse pointer always turned into a 'hand', making it difficult to change the size of the dialog, for example. This error has been fixed. **(18354)**
- Suppressing messages and questions: Up to now, a distinction was made between messages and questions (i.e. messages with different response options) in case of the option to suppress further messages with the same priority within a procedure flow. Now suppressing questions also implies suppressing messages, but not vice versa, i.e. questions are still asked until they are explicitly suppressed. **(11665)**

I/O Interfaces

- Invalid DRT values: The export to PTV MaaS Modeller issues a warning if there are OD relations with demand whose travel time is >= 24h. This is usually the case if no path was found for this relation in the network when calculating the skim matrix. Similarly, an OD relation with a travel time >= 24h, for which there is a trip request, leads to a warning when the procedure 'Tour planning' is executed, and corresponding trip requests are not taken into account. **(17877)**

Matrix Estimation

- Crash on unsuitable output medium: A crash no longer occurs when executing the 'Demand matrix correction' procedure (both variants) if either a matrix time series, no matrix or a formula matrix is selected for the demand of one of the demand segments used. **(18392)**
- Demand matrix correction after TRIBUT assignment: No more crashes when calculating the flow matrix in the 'Demand matrix correction' procedure, if it is executed for a demand segment assigned with the TRIBUT-Equilibrium assignment or with TRIBUT-Equilibrium_Lohse. **(18407)**

Network Editor

- Insert/edit texts and objects in the legend: Texts and background objects could no longer be inserted or edited in the legend. This error has been fixed. **(18353)**

Other Procedures

- Invalid DRT values: The export to PTV MaaS Modeller issues a warning if there are OD relations with demand whose travel time is >= 24h. This is usually the case if no path was found for this relation in the network when calculating the skim matrix. Similarly, an OD relation with a travel time >= 24h, for which there is a trip request, leads to a warning when the procedure 'Tour planning' is executed, and corresponding trip requests are not taken into account. **(17877)**

Scenario Management

- Deletion and duplication of objects was too slow: Deleting or duplicating objects (scenarios, modifications, etc.) in scenario management took too long. This error has been corrected. **(18400)**

Schematic Line Diagram

- Crash after rerouting a line route: No more crashes due to a lack of memory after rerouting a line route if the affected edges in the schematic line diagram represent a lot of vehicle journeys. **(18307)**

Visum Files

- Slow reading of version files and procedure parameter files: If one of the procedures trip distribution or mode choice (4-step demand model) or EVA distribution/mode choice occurred in the procedure sequence, reading in a version or procedure parameter file was unnecessarily slow. This error has been fixed. **(18371)**

17.01-05 [128616]   2018-02-08

⊕ New Features and Changes

Data Model

- ⊕ More demand segments possible: The maximum possible number of demand segments in a network was doubled from 256 to 512. **(18338)**

Installation

- ⊕ Display of an academic license: In the window title and in the license dialog, PTV Visum now indicates when an academic license is used. **(17952)**

Miscellaneous

- ⊕ File name in task bar: In the window title and in the icon in the Windows task bar, the name of the loaded network is now displayed first and then the product name, so that different instances can be distinguished more easily. **(17811)**

PuT Assignment

- ⊕ Ideal travel time and run time for DRT tour planning: After the procedure 'Tour planning' (DRT) has been carried out, the new attributes 'DRT ideal travel time', which issues the best possible travel time in terms of MaaS Modeller, and 'DRT ride time', which issues the ride time excluding the time for boarding and alighting the relevant trip request, are now provided at PuT path legs. In particular, this can be used to calculate the detour factor. In addition, the calculated attribute 'Experienced detour factor' is provided at the trip request, which outputs this detour factor (including the origin wait time). **(18220)**

Visum Files

- ⊕ All messages in log file: All messages are listed in the log file (protocol.txt). Previously, the file only contained low-priority messages that were not output in the message file messages.txt. This creates a complete log in chronological order. **(17868)**

⊘ Fixed Bugs

COM-API

- Error handling in AddColumnsForAllUserDefinedAttributes: The ITableAttrSelection.AddColumnsForAllUserDefinedAttributes method did not report an error if a non-existent table name was specified as a parameter. This error has been fixed. **(18336)**

Data Model

- Specific transition walk times when deleting time profile items: When deleting a time profile item, a specific time profile transition walk time defined at the corresponding stop was not removed, even though a warning was given that it would be deleted. This error has been fixed. **(18350)**

Dialogs

- Class name for classified bar fillings: In the 'Edit bar' dialog, user-defined names of the classes were not displayed correctly on the 'Fill style' tab if a classified filling was set. This error has been corrected. **(18168)**
- Context-sensitive help for matrix correction procedures: When calling the context-sensitive help (F1) while the parameters dialog of the procedure 'Demand matrix correction' was open, the help page for the procedure variant 'TFlowFuzzy' was always opened, even if the procedure had been set to 'Least squares'. This error has been fixed. **(18297)**
- Editing user-defined attributes at 'Network': When opening the 'Network settings' dialog, the error message 'A wrong argument was detected' appeared if the 'User-defined attributes' tab of the same dialog had been opened before but there were no user-defined data attributes at the network object 'Network' when the dialog was opened again. **(18342)**
- Message for user-defined scale in print preview: If the field for the user-defined scale was cleared on the 'Contents' page of the 'Print' dialog, several warnings were issued u'–'; even if the 'User-defined scale' option was not selected. This error has been fixed. **(18110)**

Graphics

- High DPI support for text sizes in graphical output: If the operating system was set to a text size greater than 100%, the texts defined in absolute mm sizes were not displayed in the network editor and other graphical representations in the correct size. This error has been fixed. **(17282)**
- Legend and the mode of network objects that cannot be marked: If the network editor was in the mode for a network object type that could not be marked in the network editor (e.g. vehicle journeys or lane turns), the highlighting of objects in the legend was mixed up. This error has been fixed. **(18204)**

I/O Interfaces

- Background files when importing Vistro: Graphics files used as backgrounds in the base version are now copied to the project directory for graphics files when importing Vistro and can be used as backgrounds in PTV Visum. **(15479)**
- Blocks in railML import: If a 'block' item was used in the railML data on different disjunct valid days, more blocks were created than necessary. In addition, a block could not be imported if several operating days were specified in the 'circulation' items in 'operatingPeriod' or 'nextOperatingPeriod'. These two errors have been corrected. Furthermore, a warning is now issued when a 'block' item is used more than once within one calendar day. **(18203)**
- Coach transitions passing midnight: If the first pulling train of a coach arrived after 24h at the stop point at which the coach was picked up, the resulting offset of the valid day of the coach in relation to that of the pulling train was not taken into account. As a result, the coach received a faulty valid day. This error has been fixed. **(13337)**
- Different calendars when importing railML: If the calendars in the railML file and in the target network do not match and trainPart elements with a midnight overrun are imported, an unauthorized message indicating possibly incorrect results was issued. This error has been corrected. **(17535)**

Line Blocking

- Conversion of an empty trip into a vehicle journey: When converting an empty trip in a block into a vehicle journey (e.g. from the line block editor or from the line block items list), it was previously possible to create a line route or a time profile with an empty name. Subsequently, crashes could occur during later actions. This error has been fixed. **(18224)**

Lists, Timetable Editor

- Synchronization and view filter: If the number of objects displayed in a list or in the timetable editor was increased by switching off the filter effect in the view, the selected objects were not highlighted in the list and in the timetable editor. If the number of objects displayed was reduced by switching on the filter, the number of selected objects in the global selection was also reduced. Both errors have been corrected. **(14037)**

Main Window

- Toolbars at high DPI under Windows 7: Under Windows 7 with font size 125% or more, single icons disappeared from a too narrow toolbar without being displayed in the expandable area for the icons that can no longer be displayed. This error has been fixed. **(17513)**

Matrix Estimation

- Variant 'Least squares' with skim distribution only: If only one skim distribution was taken as a basis for the count value for the demand matrix correction in the variant 'Least squares', then the matrix became too small in terms of its total sum, the more so the less weight was placed on the distance from the original matrix in the target function. This error has been corrected. **(18298)**

Miscellaneous

- Function keys as a key combination for scripts: Previously, when inserting a script into the script menu, it was possible to assign function keys as key combinations, which leads to malfunctions because these function keys are also used by PTV Visum or by operating system functions. This error has been corrected by no longer accepting function keys. **(18001)**

Network Editor

- Smart map shows wrong part of the network: After opening the Smart map, it showed an incorrect (often empty) network section instead of the entire network. This error has been fixed. **(18194)**

Other Procedures

- Communication with PTV MaaS Modeller: The communication between PTV Visum and PTV MaaS Modeller has been made more reliable, so that the procedure is less likely to be aborted due to an unreliable connection when the 'Tour planning' procedure is carried out. **(18296)**
- Factor for converting paths: When executing the 'Convert paths' procedure, the factor set for scaling the volumes was not used if paths of a demand segment were converted to paths of a different demand segment. This error has been fixed. **(18268)**
- Runtime for the procedure ' Combination of matrices and vectors': The execution of the 'Combination of matrices and vectors' procedure was significantly slowed down under certain circumstances if the network contained a lot of matrices. This error has been fixed. **(18231)**

PrT Assignment

- Detailed impedance with attribute of another transport system: If in the general procedure settings for the detailed PrT impedance you selected one of the attributes AddVal-TSys or Toll-PrTSys for a transport system other than the one belonging to the impedance definition, the attribute value for the corresponding transport system was still always used. This error has been fixed. **(18248)**

Scenario Management

- Route course layer in base version: If the route course layer is active in the base version of a scenario management project, the calculation and drawing of this layer is waited for when opening the project before the scenario dialog is displayed, although the calculation should be executed asynchronously. This error has been fixed. **(18221)**

Subnetwork Generator

- Suply of PuT demand: If one of the options 'Cut line route, include subnetwork cordon stops' or 'Entire line route from start stop point to end stop point' was used when cutting a subnetwork with assigned PuT demand, the demand crossing the border to the examined area was previously supplied at the first stop within the examined area. However, this inevitably means that the assignment result within the examined area differs greatly from that of the original network, especially if the time profiles used to cross the border do not have a stop at this stop point. This error has been corrected by supplying the demand at the cordon stop, i.e. at the first stop outside the examined area where the time profile used has a stop. This means that these routes can also enter or leave the examined area in the subnetwork using the same time profiles as in the original network. **(18165)**

Timetable Editor

- Service trip patterns with a base headway of 0 min: No more crashes when calculating service trip patterns if 0 min is set as base headway and the option 'Only fractured multiples of the base headway are permitted as service intervals for a service trip pattern' is set. **(18234)**

Visum Files

- ✅ Crash during import of version files with inconsistent node geometries: No more crashes when reading version files if they contain inconsistent node geometries of signalized nodes. **(18238)**
- ✅ Project directory for path files does not work immediately: If the project directory for path files (*. pfd) is changed in the 'Edit project directories' dialog, this new project directory did not take effect immediately after opening or saving a path file from the same dialog, but only after closing and reopening the dialog. This error has been fixed. **(18195)**

17.01-04   [127934]   2018-01-16

➕ New Features and Changes

Data Model

- ➕ Origin/destination demand of a flow bundle from path sequences at the zone: New attributes at the zone allow the output of the origin/destination demand of a flow bundle from path sequences. This comprises those path sequences in which the flow bundle condition is fulfilled for a path of the demand segment used on an element (i. e. on a section from zone to zone) for a path of the demand segment used. In this way, data from disaggregated demand models (ABM) can be analyzed. **(17799)**

Junction Editor

- ➕ Detectors in junction editor: The junction editor can now be used to edit dectectors located in the node area. **(11058)**

Main Window

- ➕ Synchronization and graphics tools: If one of the graphic tools is active (e.g. flow bundle) and a network object gets into the global marking, which does not have its own Edit mode in the network editor (e.g. a PrT path or a vehicle journey), the mode for the graphics tool is now exited and the mode corresponding to this network object is now entered instead. In particular, the corresponding selection is displayed in the network editor. **(15949)**

Other Procedures

- ➕ Multimodal assignment aborts with too many paths: The multimodal assignment used abort if it found more than 65535 path sequences for an OD pair. This error has been fixed by selecting the strongest 65535 path sequences according to distribution and discarding the remaining ones. **(18103)**

PrT Assignment

- ➕ No shortest path due to high impedances at network objects: In the assignment variants Equilibrium_Lohse, TRIBUT-Equilibrium_Lohse, TRIBUT-Equilibrium_Lohse, Stochastic assignment, Bi-conjugate Frank Wolfe network objects that are not locked on the basis of your input data but have the same effect as locked network objects due to overload are now displayed in a message. Such overloaded network objects can lead to the fact that no path can be found for some OD pairs during assignment. **(18177)**

✅ Fixed Bugs

COM-API

- ✅ Access to IDemandMatrixCorrectionPara attributes: The general procedure parameters of the 'Demand matrix correction' procedure (COM class IDemandMatrixCorrectionPara) could not be accessed. This bug has been fixed by adding the general 'AttValue' property to this class. **(18202)**
- ✅ Error accessing sharing station filter: The sharing station filter could not be accessed; each access resulted in a COM error. This error has been fixed. **(18193)**

Data Model

- ✅ Incorrect vol/cap ratio of seats/total seats on links: Up to now, the calculation of the values for the attributes 'Volume seat capacity ratio PuT' and 'Volume total capacity ratio PuT' on links has not only included the volumes on PuT lines, but also those which use transport systems of the types PuT-Walk, PuT-Aux or Sharing, although these do not provide any seats in return. This error has been fixed. **(18008 🔴)**
- ✅ Nameless transport systems, modes and demand segments: Previously, an empty name in transport systems, modes or demand segments meant that subattributes with the corresponding network object as subattribute dimension in the long name were no longer recognizable. This error has been fixed. **(16031)**

Dialogs

- ✅ Demand option in 'Calculate skim matrix from path sequences': If you opened the parameters dialog for the procedure 'Calculate skim matrix from path sequences', so far, the option 'Calculate only OD pairs with demand > 0' was always inactive, independent of the actual value of the corresponding procedure parameter. This error has been fixed. **(18207)**
- ✅ General procedure parameters for skim matrices: If, in the general procedure parameters, the number of decimal places has been changed for any PrT or PuT skim matrix, this action set the settings for the diagonal values of all skim matrices to 0. This error has been fixed. **(18219)**

Graphics 3-D

- ✅ Transparent top and bottom surfaces for prisms: If the option 'Use own style for top and bottom surface' was deactivated in a simple prism display and a transparent color was set for the prisms, the top and bottom surface was drawn opaque nevertheless. This error has been fixed. **(18107)**

I/O Interfaces

- ✅ Messages during the shapefile import: Any messages generated during the shapefile import were not displayed in the message window. This error has been fixed. **(18060)**
- ✅ Overwriting a file in railML export: If an existing file was set as output file in the railML export, this file was overwritten without prompt. This error has been fixed. **(18118)**
- ✅ Target data types during shapefile import: During the shapefile import, the data type of the target attribute was not displayed in the dialog for successfully assigned target attributes. This error has been fixed. **(18180)**

Installation

- ✅ Licensing under Turkish operating system: PTV Visum could not be licensed (and therefore not started) on Windows versions in Turkish. This error has been fixed. **(18209)**

PrT Assignment

- ✅ Messages when updating the impedances at nodes: If warnings occurred when executing the procedure 'Update impedances at node', they could not be deactivated by the option 'No more messages of this priority' for the further course. This error has been fixed. **(18190)**

PuT Assignment

- ✅ Direct distance fare with imperial units of length: In the ticket type dialog for a direct distance fare, you could not enter fares based on imperial units properly. This error has been corrected. **(18124)**
- ✅ Fares in the headway-based assignment: Depending on the options selected, fares can only have a limited effect in the headway-based assignment. The messages that indicate this fact when the procedure is carried out have been made clearer. **(18199)**
- ✅ PTripsUnlinked for passenger trip chains and circle lines: If there was a passenger trip chain between two vehicle journeys on different time profiles of a passenger trip chain, the PTripsUnlinked for the time profile of the second vehicle journey (as well as for their line route and line) were not calculated correctly. In addition, at the vehicle journey item, the use of a passenger trip chain as well as the use of a circle line transition (at the last vehicle journey item of the arriving vehicle journey) was counted as an alighting or as a boarding (at the first vehicle journey item of the continuing vehicle journey). These errors have been fixed. **(17918)**

PuT Passenger Survey

- ✅ Day change for multi-line format with time specification: If an explicit departure time is specified for the preceeding or succeeding part for multi-line survey data, this path could not be checked for plausibility if there was a day change between the arrival of a path leg and the departure of the subsequent path leg. In addition, the maximum transition time was not taken into account when switching from one path leg to the next with explicitly specified times if this option was activated in the parameters for the preceeding or succeeding parts. These errors have been fixed. **(18167)**

Timetable Editor

- ✅ Copying and pasting of vehicle journeys: When copying and then pasting vehicle journeys in the timetable editor, under certain circumstances the references to master data (valid day, vehicle combination, operator) were set to an incorrect object if there was an object in the target network whose number corresponded to the number of the object required in the source network plus the possible offset. This error has been fixed. **(18218)**

⛔ Breaking Changes

Data Model

- ⛔ Incorrect vol/cap ratio of seats/total seats on links: Up to now, the calculation of the values for the attributes 'Volume seat capacity ratio PuT' and 'Volume total capacity ratio PuT' on links has not only included the volumes on PuT lines, but also those which use transport systems of the types PuT-Walk, PuT-Aux or Sharing, although these do not provide any seats in return. This error has been fixed. On links having volumes related to PuT-Walk, PuT-Aux or Sharing, the values of these attributes are changed accordingly. (18008 ✅)

17.01-03 [127455]   2017-12-18

➕ New Features and Changes

Data Model

- ➕ Trip requests for demand-oriented public transport: A new 'Trip requests' network object is available, which can be used to model the individual trip requests of demand-oriented public transport (DRT, MaaS). Such temporally and locally differentiated trip requests can be entered / imported directly or generated with a procedure. (17653)
- ➕ Units for time specifications of signal controls: In the data model of signal controls (SC) the specifications of durations (e. g. cycle time) are now equipped with units. In particular, these can be displayed and entered in lists and in the dialog 'Edit SC' with units. These times are now also listed with units in network files. (15099)

I/O Interfaces

- ➕ Name conflict when importing PuT supply from Visum: If conflicts arise between the names of lines in the source and target network when importing PuT supply from Visum, you can now cancel the import. This is particularly relevant if the 'Replace or delete active lines in the target network' option has inadvertently not been activated in the import settings, because this leads to numerous conflicts which previously had to be resolved individually by entering conflict-free names. (16199)

Main Window

- ➕ Technical support via start page: The same data is now transferred when you call up technical support via the start page as when you call up the Help menu. As a result, the information on the Visum version, operating system and license number used are already prefilled in the web form. (17624)

Miscellaneous

- ➕ Check network - Viability for ICA: As part of the check network 'Viability for ICA' function, reference is now also made to nodes and main nodes whose impedance is calculated according to ICA, but which at the same time have a connector open to a PrT transport system. (14848)

PrT Assignment

- ➕ Access to PTV MaaS Modeller: In PTV Visum demand-oriented forms of supply can now be modelled and assigned by addressing tour optimization in PTV MaaS Modeller. To use this method, a license for PTV MaaS Modeller is required. (17593)

PuT Assignment

- ➕ Access to PTV MaaS Modeller: In PTV Visum demand-oriented forms of supply can now be modelled and assigned by addressing tour optimization in PTV MaaS Modeller. To use this method, a license for PTV MaaS Modeller is required. (17593)
- ➕ Journey distance components in overall PuT statistics and zone statistics: The individual components of the journey distance (access distance, egrees distance, PuT Aux distance, walk distance, in-vehicle distance) are now displayed as attributes in the 'PuT assignment statistics' list and at the zone. (17927)

✅ Fixed Bugs

COM

- Messages via IVisum.Log: If a message was sent with at least priority 'Note' by calling the COM method IVisum.Log, it did not appear immediately in the message window but only after the calling script was finished. This error has been fixed. **(18066)**

Data Model

- Duration of the last storyboard action: The duration of the last storyboard action of a storyboard must no longer be 0s. Storyboard actions without a temporal duration have so far led to technical problems, but such a constellation is not useful either. When changing a storyboard, the last action may be adjusted in such a way that it has a duration of at least 1s. **(16951)**

Dialogs

- Wait time when opening the search dialog: When opening the search dialog in networks with many objects of the desired type, a short but unnecessary wait time ocurred. This error has been fixed. **(18119)**

Graphics 3-D

- Classified prism display with invalid attribute: If an invalid attribute was set for a classified prism display (for example, because a user-defined attribute has been deleted), a classified display was drawn yet classified according to an indistinguishable attribute. As a result, it was not noticeable that the intended presentation was no longer possible. This error has been corrected by not drawing anything in this case, as with other classifications. **(18125)**
- Duration of the last storyboard action: The duration of the last storyboard action of a storyboard must no longer be 0s. Storyboard actions without a temporal duration have so far led to technical problems, but such a constellation is not useful either. When changing a storyboard, the last action may be adjusted in such a way that it has a duration of at least 1s. **(16951)**

I/O Interfaces

- Changing the running direction during railML import of line blocks: If the option 'Regard running direction' was selected during the railML import of line blocks, the corresponding property was nevertheless not set for the resulting blocks. This error has been fixed. **(18122)**
- Choaches in HAFAS import without a calendar: No more crash when importing HAFAS data if a network without a calendar is to be created and there is a coach that switches the pulling train after 48h. If it changes the pulling vehicle journey after 24h, it could not be read in correctly so far. This error has also been fixed. **(16716)**
- Link orientation after Shapefile import: When importing a shapefile with polylines as links, invalid node geometries could emerge if one direction was blocked for all transport systems on some of these links. This error has been fixed. **(18059)**
- Negative entries for the day offset during railML import: In the time specifications (<times> element) on the course of a <trainPart> element, negative values in the <arrDay> or <depDay> attributes were not handled correctly up to now. This error has been corrected. **(17826)**

Lists

- Graphic parameters in POI lists: If you switch between different POI categories in the POI list, until now, the attribute selection per POI category was cached and restored when switching to an already known POI category, yet not the graphic parameters. This error has been fixed. **(17796)**

Main Window

- Access of the start page to web content: If PTV Visum was started via COM or in a service environment, the contents of the start page were retrieved anyway if an internet connection was established. This error has been fixed. As a result, an instance of PTV Visum started via COM will no longer display current information on the start page. **(18176)**

Matrix Estimation

- Tolerance and weight of stop area count values inverted: If the tolerance (variant TFlowFuzzy) or the weight (variant LeastSquares) changed for the count values of PuT alighting passengers at stop areas in the procedure parameters dialog for the matrix correction procedure, this new value did not have an effect on the currently selected variant, but on the respective other procedure variant (instead of tolerance as weight and weight instead of tolerance). This error has been fixed. **(18117)**

Network Editor

- ✅ Creating a new line route course: After inserting a new line route, you could not immediately start the tabular editing on the basis of system routes after clicking on a first stop point as the starting point of the line route, but had to drag the starting position with the mouse to do so. This error has been fixed. **(18061)**
- ✅ Editing the course of a line route with nodes / stop points that are traversed several times: If you handle a node or stop point that is traversed multiple times while editing the course of a line route and select the second or a later traversing of this node / stop point in the dialog box that appears, the first traversing is moved to the new location anyway. This error has been corrected. **(18040)**
- ✅ Editing the course of a line route, fixing an element: If you click on a route element to fix it while editing the course of a line route, this element was previously only displayed as a fixed element (i.e. in Marking 2 color) after moving the mouse away from the click position. This error has been fixed. **(17698)**

Other Procedures

- ✅ Filter on OD pairs in the procedure 'Calculate skim matrix from path sequences': In the procedure 'Calculate skim matrix from path sequences' the filter for OD pairs did not work properly. All OD pairs were always considered. This error has been fixed. **(18162)**

PrT Assignment

- ✅ Lots of messages when calculating the blocking-back model: In case of messages that were issued during the calculation of the blocking-backmodel, so far, you could not suppress further messages in the same context. This error has been fixed. **(18175)**
- ✅ Queue length at two-way nodes in ICA: If, at a two-way node, the inner turn led from the major flow onto a lane shared with the straight turn of the major flow, a queue length that was too long was previously calculated for the node impedance calculation according to ICA. This error has been fixed. **(18174 🔴)**
- ✅ Two-stage turning in node impedance calculation: For the calculation of node impedances according to ICA, too small capacities were calculated at two-way nodes, at which two-stage turning can be performed. This error has been fixed. **(18169)**

Scenario Management

- ✅ Crash when loading scenarios: A crash no longer occurs when loading calculation results of scenarios with certain constellations of views (e. g. Junction editor) and markings. **(18084)**
- ✅ Used key contingents when creating a project: If there was a POI or a user-defined PrT path with the number 2.147.483.647 in a version file, the creation of a scenario management project for this network failed until now. A message was issued indicating that the key contingent has been used up. This error has been fixed. **(18160)**

Timetable Editor

- ✅ Changing the direction of a line route: If the direction of a line route was changed, the tree in the 'Timetable lines' tool window did not adjust. This error has been fixed. **(17524)**
- ✅ Graphical timetable after changing the network: No more crashes when loading a version file and restoring the views contained therein (user setting) if a different network was previously loaded in the same session and a graphical timetable was displayed. **(18120)**
- ✅ Number of vehicle journeys in timetable lines when changing the time profile: When moving a vehicle journey to another time profile or a different line route in the timetable editor, the number of vehicle journey per time profile or line route displayed in the timetable lines tool window did not update. This error has been fixed. **(18112)**

Transfers display of regular services

- ✅ Deleting displayed line routes: When deleting a line route whose vehicle journeys are visible in the vehicle journey selection of an open transfers display of regular services, a strange message appeared and the user interface failed to respond correctly. This error has been corrected. **(18154)**

Visum Files, I/O Interfaces

- ✅ Change of the link type during additive network reading or railML import: If the option 'Always insert line route; direct link is opened if possible, otherwise it is inserted' is activated and a link type is specified for the opened links with which they are to be marked, then links that were already open for the transport system were also provided with this link type. This error has been fixed. **(17669)**

⚠ Breaking Changes

PrT Assignment

🛑 Queue length at two-way nodes in ICA: If, at a two-way node, the inner turn led from the major flow onto a lane shared with the straight turn of the major flow, a queue length that was too long was previously calculated for the node impedance calculation according to ICA. This error has been fixed. This changes the assignment results of assignments with ICA. (18174 ✅)

17.01-02   [126950]   2017-11-28

⊕ New Features and Changes

Data Model

⊕ Synchronization of connecting journey with vehicle journeys: If a connecting journey is marked and the current view cannot mark connecting journeys but vehicle journeys (e. g. the tabular or graphic timetable), it now marks the two vehicle journeys involved in the connection when synchronization is activated. (18019)

Graphical Procedures

⊕ Selected network objects for shortest path search and isochrones: In the tool window 'Graphics tools' on the dialog pages for isochrones and shortest path search, the selected network objects are now displayed in a table where they can be edited as well, analogous to the flow bundle. In order to increase the analogy of the different dialog pages, some existing controls have also been rearranged. (13602)

Graphics

⊕ Editing bar labels in the print preview: Bar labels can now be moved in the print preview within the Print dialog of the network editor. (16929)

Graphics 3D

⊕ Improvements in Storyboard editor: Several improvements regarding the usability have been made in the Storyboard editor, which can optionally be displayed in the 3-D network view. (16950)

Installation

⊕ Optional installation of CodeMeter-Runtime: You can now optionally disable the installation of CodeMeter-Runtime during an update or setup. This is useful if CodeMeter-Runtime already exists and a new installation could damage the existing installation. (18091)

Junction Editor

⊕ Update of the Vissim node preview: The Vissim node preview in the Junction editor now uses the program version PTV Vissim 10.00-03. (18094)

PrT Assignment

⊕ Avoidance of cycles (gridlocks) in SBA: Optionally, simulation-based dynamic assignment (SBA) can be calculated while avoiding cyclic dependencies (so-called gridlocks). In many cases, situations in which a vehicle can no longer drive because it waits moving in circles for another vehicle are detected and resolved. (17679)

Schematic Line Diagram

⊕ Multiline texts: The freely positionable texts in the schematic line diagram can now also be multiline, that is, they can contain and display line breaks. (17404)

⊕ Selecting vehicle journeys from a vehicle journey context: In the context of a vehicle journey, e. g. for marked vehicle journeys in the timetable editor or in a list, you can now include this vehicle journey directly in the vehicle journey selection of a schematic line diagram. The same applies to lines and directions if the vehicle journey selection of the schematic line diagram is defined at this level. (16600)

Timetable Editor, Network Editor

⊕ Number of vehicle journeys of the line: In the line selection of the tool window 'Timetable lines' as well as in the 'Lines / Line routes' floating dialog in the network editor, the respective number of vehicle journeys of the line or line route is now displayed. (17652)

Transfers display of regular services

- ➕ Marking of connecting journeys: If one or more connecting journeys are part of the global marking, a synchronized transfers display of regular services will now mark the arriving service group containing the From-vehicle journey item of the connecting journey and the departing service group containing the To-vehicle journey item, as far as they are visible. **(18097)**

✅ Fixed Bugs

COM

- ✅ Table 'Info signs' in 'Frequent cases: Graphics & presentation': Previously, the table 'Info signs' was not included in the template 'Frequent cases: Graphics & presentation' when saving and reading network files. This also applied to the COM method 'AddCommonUseCaseGraphicAndPresentation'. This error has been fixed. **(18052)**

Data Model

- ✅ Network check - vehicle journey items without a vehicle journey section: If the 'Check network' function 'vehicle journey items without vehicle journey sections' finds such vehicle journey items, you can delete them using the 'Repair' function. If there is a query about dependent objects, which must also be deleted (e. g. couplings), and the user cancels the operation, a crash occurred when the 'Repair' function was executed again. This error has been fixed. **(18067)**
- ✅ Origin/destination traffic flow bundle at main zones: No more crashes when evaluating one of the attributes 'Origin traffic flow bundle' or 'Destination traffic flow bundle' at a main zone. **(18085)**

Dialogs

- ✅ Conflict avoidance for frequent cases when reading networks additively: The 'conflict handling' column in the 'Read network data additively' dialog was not always updated according to the settings made after exiting the 'Use cases for additive network reading' dialog (accessible via the 'Frequent cases' button). This error has been corrected. **(18080)**
- ✅ Creating mode nodes in the procedure parameters dialog of 'Nested Demand': In the dialog for the mode selection tree, which is opened from the parameters dialog of the 'Nested Demand' procedure, no mode nodes could be created if the tree already had more than 2 levels. This error has been fixed. **(18025)**

Filters

- ✅ Effect of filter conditions on subordinate POI categories: In the POI filter, filter conditions defined at the level of a POI category optionally also affect the subordinate POI categories. If the filter conditions were then changed, this change only affected the POIs of their own category, not those of the subordinate POI categories. This error has been corrected. **(18030)**

Graphical Procedures

- ✅ Flow bundle term of type 'Line selection': If for a flow bundle term of the type 'Line selection' any property is subsequently changed in the dialog, the line selection has been reset to all lines. This error has been fixed. If the network object type is changed, all objects of the new type are still transferred to the selection. **(18089)**

Graphics

- ✅ Volume bars in case of changes to the OD pair filter: When changing the OD pair filter, the volume bars did not update immediately if the 'Filter network volumes' option was selected. This error has been fixed. **(18027)**

Graphics 3-D

- ✅ Crash on virtual machines: No more crashes when opening the 3-D network view on a virtual machine (VM). However, the 3-D network view still cannot be opened on virtual machines. Trying to do so will just no longer cause a crash. **(17998)**
- ✅ Height information in height bands display: Correction factors for the calculation of height bands were not applied correctly in the display of height bands. In particular, a set network scale did not take effect in networks without a coordinate system, but distortions were also not taken into account when using coordinate systems. **(18098)**

I/O Interfaces

- ✅ Information during Shapefile import: During the Shapefile import, the progress information and possible messages have been improved. In particular, the network objects affected by errors can now be clearly identified. **(17949)**
- ✅ Memory consumption during HAFAS import: The memory consumption during the HAFAS import has been significantly reduced. **(18083)**

- ✅ Nodes without demand for MaaS export: When exporting to MaaS Modeller, warnings are only issued for From- and To-nodes of zones in service areas for which there are no PUDO nodes if this From- or To-node belongs to at least one zone with demand. Only nodes with demand are now exported. **(18047)**
- ✅ Output of unassigned Ocps during railML import: In the course of the extended output of unassigned Ocps during railML import, not all found Ocps were issued as a message. This error has been corrected by listing all affected Ocp elements at least in the message window. Ocps that are not specified as transport-relevant and that occur only as a pass through in the route course of vehicle journeys are shown separately. **(18038)**
- ✅ Passenger trip chains after midnight when importing railML: During the railML import, passenger trip chains were not created if both the origin and the destination vehicle journey sections begin after midnight and the departure time of the destination vehicle journey section is after the departure time of the origin vehicle journey section. This error has been fixed. **(17976)**
- ✅ PuT valid days of through coaches in the HAFAS Import: When importing HAFAS data with through coaches it could happen that the corresponding vehicle journey of the through coach does also run at other calender days on which the pulling train does not run if this pulling train consists of several vehicle journey sections with different PuT valid days. This error has been fixed. **(17251)**
- ✅ Shapefile export of line routes: During the shapefile export of line routes, the issued z-coordinates were shifted in relation to the x- and y-coordinates. This error has been fixed. **(17948)**
- ✅ Unreachable candidates when importing PuT supply from Visum: No crash when importing PuT supply from Visum ('public transport updater') if the option 'Run detour test' is activated for the routing and if there are possible locations for a line route item in the destination network that cannot be reached by an imported route. **(18039)**

Juction Editor

- ✅ Procedure execution with open signal times view: No more crashes when executing a procedure sequence when a junction editor is open in the signal times view. **(17594)**

Junction Editor

- ✅ Handling of the [Del] key: If the delete key ([Del]) is pressed while the junction editor has the focus but no object is selected in the junction editor, the delete command is passed to the network editor, i. e. any selected objects that are not visible in the junction editor are deleted. This error has been fixed. **(15703)**
- ✅ Invalid results from the Node impedance calculation ICA: In certain cases the node impedance calculation ICA produced results with invalid numbers, which cannot be used in subsequent calculations. This error has been fixed. **(17938)**

Lists

- ✅ Crash when deleting filtering network objects: If a local filter was active in a list that used a network object as filter condition (for example a demand segment in a path list, a toll system in a matrix toll list, or a line route in a line route item list), and this network object was deleted, a crash could occur u'–'; especially if the command history was switched off. This error has been fixed. **(17873)**
- ✅ Restoring lists with analysis rows: Restoring certain lists while opening a version file no longer causes a crash if analysis rows are enabled in the list (minimum, maximum, average, sum). **(17858)**

Main Window

- ✅ Long message texts in the message window: If very long message texts were displayed in the message window, Visum froze when displaying the complete text as a tooltip. This error has been fixed. **(18064)**
- ✅ Zooming in the Smart map: In the Smart map you could no longer zoom using the keyboard (picture up/down buttons) as long as the Smart map was docked to other windows. This error has been fixed. **(18024)**

Matrix Editor

- ✅ Saving an external matrix under a new file name: When saving an external matrix under a new file name, the title of an open matrix editor that displayed this external matrix did not adapt. This error has been fixed. **(17328)**

Matrix Estimation

- ✅ Messages for invalid tolerances: When executing the 'TFlowFuzzy' variant of the 'Demand matrix correction' procedure, a separate message was issued for each count value with invalid tolerance, without the possibility of suppressing messages of the same type in the further execution of the procedure. This error has been fixed. **(18099)**

Network Comparisons

- ⊘ Update version comparison and graphical timetable: No more crashes after updating a version comparison with a network loaded in the background if a graphical timetable is open or opened later in the 'front' network. **(17910)**

Network Comparisons, Scenario Management

- ⊘ Stop area walk times when reassigning a stop area: If a stop area is assigned to a different stop area than before, and if this change is displayed as a model transfer file or as a modification in a scenario management project, already existing transition walk times from or to the reassigned stop area were lost when reading the model transfer file or applying the modification. This error has been corrected. **(18062)**

Network Editor

- ⊘ Default allocation t_PuTSys for routes: In the case of the default allocation of links with the run time per public transport system (attribute t_PuTSys), links were previously excluded if they had a length of 0m or if the link type for the transport system had a speed of 0km/h. This error has been corrected. Links with a length of 0m now also get a run time of 0s. In case of a speed of 0km/h at the link type, the link run time is set to the maximum possible value. **(16238)**
- ⊘ Flickering of marked objects when moving the mouse: If the network editor shows a marked object whose geometry could change (e. g. because interactive editing of geometries is activated), movements of the mouse pointer caused unpleasant flickering of these marked objects. This error has been fixed. **(17768)**
- ⊘ Inserting connectors with dialog display: No more crashes when inserting connectors if the user setting 'Show dialogs when inserting objects' is activated. **(18044)**
- ⊘ Undo aggregation of line routes by attribute: No more crashes when restoring, if aggregating of line routes with additional conditions has been executed before and this action has been undone. **(18032)**

Other Procedures

- ⊘ Allocation to vehicle journey sections in Spatial PuT analysis: In the 'Spatial PuT analysis' procedure, values from attributes were not entirely distributed in the 'Allocation per calendar day in AP' distribution rule, i.e. the share for days in the analysis period not served by any vehicle journey section was lost. This error has been corrected. **(18051)**
- ⊘ Setting run and stop times 'from link run time': In the 'Set run and dwell times' procedure, the factor from the 'From link attribute' option was used when the 'Update run times from link run time' option was set. This error has been fixed. **(18053)**

PrT Assigment

- ⊘ SBA deletes paths with low volumes: The simulation-based dynamic assignment (SBA) previously deleted paths with positive, albeit very small volumes. This could lead to new paths being found, especially when starting from an initial assignment with only one iteration, i. e. when all paths of the origin-destination relation had very low volumes. This error has been corrected. **(18078 🛑)**

PrT Assignment

- ⊘ Invalid results from the Node impedance calculation ICA: In certain cases the node impedance calculation ICA produced results with invalid numbers, which cannot be used in subsequent calculations. This error has been fixed. **(17938)**
- ⊘ Lost demand in Tribut-equilibrium assignment: If there are several demand segments in the network that use the same PrT transport system, demand may not be completely assigned in the Tribut-equilibrium assignment, i. e. the volumes on the routes of an origin-destination relation is lower than the demand for this relation. This error has been fixed. **(18029 🛑)**
- ⊘ Maximum wait time in SBA: In simulation-based dynamic PrT assignment (SBA), the maximum wait time at nodes has not been taken into account correctly in many cases. This error has been fixed. **(18086 🛑)**

PuT Assignment

- ⊘ Skim matrices for fare and number of fare zones in headway-based assignments: When calculating PuT skim matrices for the fare or the number of fare zones with the headway-based assignment, they used to have value 0 for all relations at all times if 'min. PJT connection' was selected as aggregation type. This error has been fixed. **(17999)**

PuT Line Blocking

- ⊘ Printing the line block view with page margin: If you set a left and/or right margin when setting up the printing page for the line block view, a completely incorrect printout was created so far. This error has been corrected. **(16582)**

VIsum Files

- Messages when aborting the network file import: If the import of a network file is aborted while table line route item, time profile item or system route item is read in, all line routes, time profiles or system routes that have already been read in have no course. The messages that indicate this have not yet offered an option 'No more messages of this type'. This error has been fixed. **(18036)**
- Coupling sections in omitted network references from network file: If the 'Ignore line route item with unknown network reference' option is active when reading a network file additively, and if the conflict handling option 'Overwrite object' is selected for vehicle journey items and vehicle journey sections, in certain cases coupling sections from the network file could not be read in successfully. This error has been fixed. **(18033)**
- Method for impedance calculation at node: The method selected for the impedance calculation according to ICA was represented differently in procedure parameter files of PTV Visum 16 and PTV Visum 17 ('HCM 6th Edition' vs. 'HCM 2015'). As a result, the setting was lost when reading procedure parameters in the respective other main version. This error has been fixed: both program versions can now also read and apply the 'other variant'. **(18017)**
- Reading network files with surfaces while 3-D view is open:
  No more crashes when reading a network file additively if data of surface objects is changed and the 3-D network view is open during import. **(18093)**
- Table 'Info signs' in 'Frequent cases: Graphics & presentation': Previously, the table 'Info signs' was not included in the template 'Frequent cases: Graphics & presentation' when saving and reading network files. This also applied to the COM method 'AddCommonUseCaseGraphicAndPresentation'. This error has been fixed. **(18052)**

⊘ Breaking Changes

Assignment PrT

- Maximum wait time in SBA: In simulation-based dynamic PrT assignment (SBA), the maximum wait time at nodes has not been taken into account correctly in many cases. This error has been fixed. This changes the results of the simulation-based dynamic assignment. In many cases, the change also accelerates convergence. **(18086 ⊘)**

PrT Assigment

- SBA deletes paths with low volumes: The simulation-based dynamic assignment (SBA) previously deleted paths with positive, albeit very small volumes. This could lead to new paths being found, especially when starting from an initial assignment with only one iteration, i. e. when all paths of the origin-destination relation had very low volumes. This error has been corrected. Due to the changed allocation, changes in the procedure results can occur in rare cases because individual vehicles are assigned a different path. **(18078 ⊘)**

PrT Assignment

- Lost demand in Tribut-equilibrium assignment: If there are several demand segments in the network that use the same PrT transport system, demand may not be completely assigned in the Tribut-equilibrium assignment, i. e. the volumes on the routes of an origin-destination relation is lower than the demand for this relation. This error has been fixed. Since the calculation logic had to be changed, the assignment result changes in the case of several demand segments per transport system. **(18029 ⊘)**

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⊕ New Features and Changes

Data Model

- Fallback language for attribute descriptions: The fallback language is now used for attribute descriptions, which are for example displayed in the tooltips of list headers or in the attribute selection dialog. The attribute description is thus displayed in the fallback language if no description exists in the currently set language. **(17883)**

Dialogs

- Stop identifiers in coupling dialogs: The dialogs for coupling and separating vehicle journeys now use the name of the stop as identifier if it is not empty. **(17915)**

I/O Interfaces

- ⊕ From- and To-node in MaaS export: The export to MaaS Modeller now also contains From-node and To-node for trip requests, which can be different from the pickup and dropoff nodes. **(17771)**
- ⊕ Non-allocated 'ocps' in railML import: When importing railML, 'ocp' elements, which cannot be allocated clearly to a stop point in the network, are now also issued in a warning if their property 'propService' is not set but at least one 'trainPart' with a commercial stop exists at this 'ocp'. **(17925)**

I/O Interfaces, Other Procedures

- ⊕ Walk times in MaaS export: The execution of the export to MaaS Modeller as well as the 'Tour planning' procedure are now rejected if multiple demand segments shall be handled, whose respective allocated transport systems contain different PuT-Walk transport systems, because the different walk times per demand segment cannot be mapped in the MaaS Modeller. In this case, export and tour planning need to be run separately for each demand segment. **(17966)**

Other Procedures

- ⊕ HBEFA update to version 3.3: The calculation of emissions according to HBEFA has been adjusted to the version HBEFA 3.3. In order to be able to use HBEFA, it is essential to install the new version of the HBEFA data package. Calculations according to HBEFA 3.1 are no longer possible. **(16002)**

✅ Fixed Bugs

ANM

- ✅ ANM export of a subnetwork is not imported in PTV Vissim: Even though data was prepared for an ANM export of a subnetwork, the data was not imported automatically in PTV Vissim. This error has been fixed. **(17977)**

COM-API

- ✅ Error message for IFlowBundle::CreateCondition with invalid parameter: No useful error message was issued when calling IFlowBundle::CreateCondition (in its different variants) if parameter 'NetElem' was invalid. This error has been fixed. **(17997)**

Data Model

- ✅ Access node number at sharing stations: The attribute 'access node number at sharing stations' could not be edited even though you could edit the node by entering a number. This error has been fixed. **(17712)**

Dialogs

- ✅ Sum of the times of the 'Edit line route' dialog: The total of the run and dwell times shown in the 'Edit line route' dialog was not correct. This error has been fixed. **(17951)**

Filters

- ✅ Filtered volume matrix: Function FILTEREDASSIGNEDVOLUMEMATRIX() in matrix-valent formulas, which delivers the volume matrix of the demand segment filtered by the OD pair filter, did not update its values when deactivating the filter for OD pairs. This error has been fixed. **(17981)**

Formulas

- ✅ Filtered volume matrix: Function FILTEREDASSIGNEDVOLUMEMATRIX() in matrix-valent formulas, which delivers the volume matrix of the demand segment filtered by the OD pair filter, did not update its values when deactivating the filter for OD pairs. This error has been fixed. **(17981)**

Graphical Procedures

- ✅ Sporadic crashes when calculating a flow bundle: Sporadic crashes no longer occur when calculating flow bundles with multiple cores. **(17956)**

Graphics

- ✅ Direct editing of the legend: Directly editing the legend no longer causes a crash if the mouse pointer leaves the legend after opening a shortcut menu and then reappears in order to select an entry from the shortcut menu. **(17947)**
- ✅ License confirmation in case of disabled OpenStreetMap maps: When loading a version file for which an OSM map had been set as background map, license terms were queried even if the loading of background maps was disabled in the user preferences. This error has been fixed. **(17957)**

- Text is drawn at hidden point object: Even though the 'Draw point object' option was not checked, text was drawn at point objects if the 'Avoid overlapping when drawing' option was deselected. This error has been fixed. **(17959)**

I/O Interfaces

- 'trainParts' without vehicles in railML import: When a 'trainPart' element referenced a formation element, which in turn did not reference any vehicles, no vehicle journey section was generated in Visum for this 'trainPart'. When a 'train' consisted of just one 'trainPart', the respective vehicle journey was thus not imported either. This error has been fixed, i.e. a vehicle journey section is now also generated in this case, yet without indication of vehicle information. Furthermore, a warning is now issued in this case. **(17851)**
- Database connection with MS SQL server: A crash no longer occurs during a database export to MS SQL server when you enter an incorrect connection string. **(17965)**
- railML import accelerated: The railML import has been accelerated. The effect is particularly significant if a filter is active in the target network. **(17807)**

Installation

- Network size CN not working: The network size CN could not be licensed. This bug has been fixed. **(18012)**

Matrix Editor

- Filtered volume matrix: Function FILTEREDASSIGNEDVOLUMEMATRIX() in matrix-valent formulas, which delivers the volume matrix of the demand segment filtered by the OD pair filter, did not update its values when deactivating the filter for OD pairs. This error has been fixed. **(17981)**
- Incomprehensible message for matrix swap file: The error message, which is issued when activating the matrix swap file while a network with matrices is loaded, was not very meaningful and has been improved. **(17724)**
- Projection of matrices: When projecting matrices to target values from zone attributes, any type of attribute used to be provided for the labeling of external zones. However, when running the procedure, only attributes of the type Bool were accepted. Now all numerical attributes of the zone can be used (especially AddValues) whose contents are interpreted as truth values. **(15061)**

Network Comparisons

- Network merge mode and stop points with different characteristics: A crash no longer occurs when starting the network merge mode for two networks, which contain a link stop point with the same number on the same link, but one is directed and the other one is undirected or both are directed but in opposite direction. In this case, the networks cannot be merged and the network merge mode is now rejected. **(17971)**

Network Editor

- Aggregating lines with additional conditions: When aggregating lines with an additional condition for an attribute, under certain circumstances, too many lines could be generated, i.e. certain possible aggregations were not carried out. This error has been fixed. **(17885)**
- Cancelling the deletion of connected nodes with two legs: When deleting nodes with two legs via the Multi delete dialog without the option 'Exclude connected nodes from deletion', so far, a query used to be displayed for connected nodes. When you rejected the deletion at this point (button 'No' or 'No for all'), the two links connected by the node were merged, but the node itself was not deleted. It remained in the network as an isolated node. This error has now been fixed: if the command history is active during the deletion, the original state is restored. If it is not active, the query is suppressed. **(17993)**
- Moving boundary points of surfaces in case of shared edges: When you moved a point A onto a different point B of the same surface editing a surface in the network editor, both points were merged into one point. However, if point A was also used by other surfaces, it was deleted there instead of being replaced by the new shared point. This error has been fixed. **(16104)**
- Renumbering marked matrices: In the Matrices tool window and in the matrix list, only the currently selected matrices were renumbered instead of all matrices, when calling the 'Renumber' function. This error has been fixed. **(17988)**

Other Procedures

- Messages during procedure 'PuT spatial analysis': So far, exceptions that occurred while running procedure 'Spatial PuT analysis' were not issued as error messages. This error has been fixed. **(17195)**
- Vehicle hours in assignment analysis: When calculating the assigned and observed vehicle hours in the course of the 'Assignment analysis' procedure, so far, calculations were based on the travel time in the uncharged network t0. This error has now been fixed: the program now uses a travel time averaged over the volumes of the individual transport systems in the charged network tCur, assuming that the distribution of the volume to transport systems with different maximum speeds is similar to the distribution in the assignment result for the observed values. **(17764 ⊘)**

PrT Assignment

✅ Executing an assignment while a path is marked: A crash no longer occurs when running a PrT assignment while a path is marked in the PrT path list. **(17854)**

PuT Assignment

✅ Headway-based assignment with irregular headways: In headway-based assignments, Visum calculated a faulty distribution if time profiles with irregular headways (in seconds) existed. If coordinated time profiles with irregular headways existed on top of that, certain paths were sometimes not found. This particularly occurred when the coordinated time profiles had different headways. This error has been fixed. **(17961 🔴)**

✅ Too many progress dialogs when reading in connection files: If you read in connections from files for a timetable-based assignment, so far, a separate progress dialog used to be opened for each file with the effect that the main window was displayed in the foreground again and again. This error has been fixed. **(17974)**

PuT Line Blocking

✅ Finish calculating iteration during line blocking with vehicle interchange: When canceling an assignment with vehicle interchange during the iteration phase, users could no longer decide whether to finish the running iteration and output the interim result or cancel the procedure without a result. This error has been fixed. **(17983)**

PuT Passenger Survey, Graphical Procedures

✅ Shortest path search at stop areas with long walk links: Paths that require a long walk link were not found in the shortest path search from/to stop areas, neither in interactive PuT path searches nor in the course of the plausibilization of survey data. This error has been fixed. **(17941 🔴)**

Timetable Editor

✅ Crash when deleting a line: Under certain circumstances, the program used to crash when deleting a line, line route, or time profile while the associated vehicle journeys were displayed in the tabular timetable. This has been fixed. **(17919)**

Visum Files

✅ Reading in matrices from $O files: Reading in matrices from $O files was too slow, especially when running the OD relations in an unfavorable order. This error has been fixed. **(17973)**

🔴 Breaking Changes

Other Procedures

🔴 Vehicle hours in assignment analysis: When calculating the assigned and observed vehicle hours in the course of the 'Assignment analysis' procedure, so far, calculations were based on the travel time in the uncharged network t0. This error has now been fixed: the program now uses a travel time averaged over the volumes of the individual transport systems in the charged network tCur, assuming that the distribution of the volume to transport systems with different maximum speeds is similar to the distribution in the assignment result for the observed values. This changes the results of the assignment analysis for the assigned and observed vehicle hours. **(17764 ✅)**

PuT Assignment

🔴 Headway-based assignment with irregular headways: In headway-based assignments, Visum calculated a faulty distribution if time profiles with irregular headways (in seconds) existed. If coordinated time profiles with irregular headways existed on top of that, certain paths were sometimes not found. This particularly occurred when the coordinated time profiles had different headways. This error has been fixed. This leads to changes in the results of the headway-based assignment, particularly in connection with coordination. Small deviations also occur without coordination. **(17961 ✅)**

PuT Passenger Survey, Graphical Procedures

🔴 Shortest path search at stop areas with long walk links: Paths that require a long walk link were not found in the shortest path search from/to stop areas, neither in interactive PuT path searches nor in the course of the plausibilization of survey data. This error has been fixed. This leads to changes in the results of the procedure 'Plausibilisation of survey data' in the affected networks. **(17941 ✅)**

⊕ New Features and Changes

Data Model

⊕ Modification of Passenger trips unlinked calculation: The meaning and thus the values of the 'Passenger trips unlinked' and 'Passenger trips unlinked' DSeg attributes of lines, routes and operators have been changed. A path that uses multiple vehicle journeys of the same line, the same line route or the same operator is only counted once and not once every time. At the level of the travel time profiles and vehicle journeys, the same procedure has already been used. **(11626 ❗)**

Add-Ins

⊕ Time series analysis of accident data: A new Add-In enables a time series analysis of accident data. The Add-In requires an existing installation of JAGS (http://mcmc-jags.sourceforge.net). **(16172)**

Demand Procedures

⊕ Use of multimodal paths in P+R: The procedures 'P+R lot choice' and 'P+R leg split' now exclusively use multimodal paths to save and output P+R relations. This reduces memory consumption and the distribution of the demand of a relation to the P+R lots can be retraced. **(17286 ❗)**

Graphics

⊕ OSM Cycle Background Map has been removed: The OpenStreetMap (Cycle Map) map service has been removed from the installation, due to the introduction of API keys for personal authentication at the provider thunderforest.com. **(17880 ❗)**

I/O Interfaces

⊕ Connecting to a Personal Geodatabase with 64bit: The connection to a Personal Geodatabase can now be established with the 64bit version of PTV Visum in order to display objects as GIS objects. **(6308)**

⊕ Export to MaaS Modeller impossible: If the export to MaaS Modeller is not possible because predictable conditions are violated, the parameters dialog does not open. Instead, the circumstance, which prevents the export, is pointed out directly. **(17842)**

Main Window

⊕ Drag & drop files on start page: You can now use drag & drop on the start page. **(17801)**

⊕ Main menu for lines, PrT paths, and system routes: The 'Edit' menu has been restructured for objects of the PuT line hierarchy as well as for PrT paths and system routes. **(17758)**

⊕ Start page: At startup, PTV Visum now provides a start page with current information. **(15306)**

⊕ Window menus: The menus belonging to a specific window (list, timetable, matrix editor, etc.) have been unified, means that the selection and sequence of recurring entries have been brought into line. **(17181)**

Miscellaneous

⊕ Settings for completing the course of line routes or system routes: The settings for completing the course of line routes or system routes in the context of reading a network additively can now be saved in the user preferences under Network > Lines. **(16456)**

Network Editor

⊕ Cancel via progress dialog when normalizing surfaces and when merging points with equal co-ordinates: Normalizing surfaces and merging points with the same co-ordinates can take a long time. Therefore, you can now cancel both operations via a progress dialog. **(15869)**

PrT Assignment

⊕ Handling of special values in the demand: In PrT and PuT assignments, Visum not only checks the demand of each relation for negative values but also handles special values like #inf (infinite) or #nan (not a number) now, which are sometimes generated during matrix calculations. Affected relations are issued as warnings and a demand of 0 is assumed. **(17810)**

PuT Assignment

- ⊕ Handling of special values in the demand: In PrT and PuT assignments, Visum not only checks the demand of each relation for negative values but also handles special values like #inf (infinite) or #nan (not a number) now, which are sometimes generated during matrix calculations. Affected relations are issued as warnings and a demand of 0 is assumed. **(17810)**
- ⊕ Modelling of roundtrip systems: The modelling of roundtrip systems with in Vehicle Sharing is now possible. The calculation of the load dependent impedance on picked up vehicles is analogously to the calculation on stations. An attribute is introduced to model the minimum dwell time in the zone. The load dependent network impedance and the balance factor on zones were removed. **(16893 ❗)**
- ⊕ Modification of Passenger trips unlinked calculation: The meaning and thus the values of the 'Passenger trips unlinked' and 'Passenger trips unlinked' DSeg attributes of lines, routes and operators have been changed. A path that uses multiple vehicle journeys of the same line, the same line route or the same operator is only counted once and not once every time. At the level of the travel time profiles and vehicle journeys, the same procedure has already been used. **(11626 ❗)**

Schematic Line Diagram

- ⊕ Direct editing of legend: The legend of the schematic line diagram and the graphical timetable can now be edited directly, just like the one in the network editor (see ID 16595). **(17541)**

Timetable Editor

- ⊕ Direct editing of legend: The legend of the schematic line diagram and the graphical timetable can now be edited directly, just like the one in the network editor (see ID 16595). **(17541)**

Visum Files

- ⊕ Display area in global layout: The global layout file now also contains the current display area of the network editor. **(17678)**
- ⊕ Layout for timetable lines and line block selection in global layout: The layouts of the tool windows 'Timetable lines' and 'Line block selection' are now part of the global layout, i.e. the contents of these tool windows are restored when saving and later reading in a global layout. **(17747)**

✅ Fixed Bugs

Data Model

- ✅ Additive network reading and applying model transfer files: Additive network reading with the options 'Overwrite object' or 'Overwrite attributes' as well as applying model transfer files did not work for path sequence sets and path sequence activities. This error has been fixed. **(17830)**
- ✅ Messages during building meso graph: Messages generated during the building of the meso-graph because certain attributes, which requires the calculation of the graph, for example, are displayed in a list are now no longer interrupt the procedure, but only creates entries in the message window. **(17798)**
- ✅ Transport systems with invalid default values: If a transport system was created with program version 16.01-00 to 16.01-05 or a network from previous versions of the program was opened and saved as a version file, the new or transferred transport systems could not be edited via the dialog. This error has been corrected. **(17616)**

Demand Procedures

- ✅ Overflow in Multi procedure and Furness procedure: If you left the value range for floating-point numbers while executing a Multi or Furness procedure in the context of an 'EVA distribution/mode choice', 'Combined tour-based model - trip generation/mode choice' or 'Tour-based freight trip generation' operation, invalid entries could occur in the result matrices. The procedure is now canceled (with a warning) in this case and the values of the last iteration with valid values are issued. **(15893)**
- ✅ Weight for P+R vol/cap ratio: The skim calculation and the distribution of the demand now consistently consider the factor for the weight for P+R vol/cap ratio. So far, a factor of -1 was assumed for the distribution. This error has been fixed. **(17358)**

Dialogs

- ✅ 'Hidden' buttons for formulas: In some dialogs in which you can enter a formula, some buttons to insert formula components were hidden depending on the current size of the dialog. In such cases, a graphical message now appears with the option to reach the hidden buttons anyway. **(16952)**
- ✅ Activating a route point without a time profile: A crash no longer occurs if, in the 'Edit line route' dialog, you activate a route point for an element of a line route that has no time profile. **(17862)**

- Dropdown list for network object refernces with blank values: When editing attributes which represent an optional reference to a network object (for example, operator number), the empty reference can now be selected directly dropdown list when using the extended input options. **(17929)**
- Floating-point numbers in link dialog: In the 'Edit link' dialog, Visum always rounded floating-point numbers (for example speeds) to whole numbers instead of using the number of decimal places specified in the network settings for the given attribute type. This error has been fixed. **(17855)**

Filters

- Deleting and restoring a user-defined attribute: If a filter condition applied to a user-defined attribute and this attribute was first deleted and then restored, the corresponding filter condition was not also restored. This error has been fixed. **(17426)**

Graphical Procedures

- Button for the calculation of flow bundles: Sometimes the button for the calculation of the flow bundle was falsely grayed out. This error has been fixed. **(17828)**

Graphics

- Drawing link bars while executing a script: A crash no longer occurs when parallel calculations are carried out for the drawing of the bars during script execution. **(17539)**
- Hovering uses attributes of marked objects: If network objects were highlighted because the mouse pointer hovered over them, attributes of a different, marked network object were displayed if the table was activated for the network object type in the 'Marked' graphic parameters. This error has been fixed. **(17773)**
- Line filter in legend: The line filter was not taken into account so far when displaying line bars in the legend, i.e. bars were also displayed for inactive objects in the legend. This error has been fixed. **(17576)**

Graphics 3-D

- Extended markings in 3-D network view: By mistake, instead of activating or deactivating the extended markings in the 3-D network view, a screenshot used to be created when running the respective command. This error has been fixed. **(17861)**

Main Window

- Collapsing a group in message window: Visum could not be used any more when collapsing a group in the message window and then clicking this group. This error has been fixed. **(17848)**
- Continued display of start page when loading a version file: If, in the user preferences under 'GUI - General', you set option 'Load from version file' for windows and 'Keep configuration' for tool windows and then loaded a version file with more than one window, the previously displayed start page remained open in a separate tab group instead of being replaced by the windows found in the version file. This error has been fixed. **(17875)**
- Menus and tooltips in case of focus on another program: If the focus was on a program other than PTV Visum, several tooltips were no longer displayed (e.g. of the list of recently used files) and buttons of the tool windows were no longer highlighted, even though they could still be used. This error has been fixed. **(17912)**

Network Editor

- Changing allocations of nodes to main nodes with PrT paths: If a user-defined PrT path existed, which passed through a main node and, in the course of this, used two different cordon nodes to enter and exit the main node, it was not deleted (nor adjusted) when removing the allocation of one of the cordon nodes to the main node. This error has been fixed. **(17881)**
- Closing the network editor while editing a line route: If you closed the network editor while editing the course of a line route, system route, or PrT path, you could not exit this mode any more. The error has been fixed by permitting the user to reopen the network editor in this situation in order to finish or cancel the modification of the course. **(17906)**
- Connecting nodes with links: A crash no longer occurs when connecting nodes with links in certain specific cases. **(17833)**
- Parameters dialog for 'Connect nodes via links' does not open: The parameters dialog for the operation 'Connect nodes via links' remembers the settings during a Visum session. If you repeated this operation in a network with fewer target nodes than the required minimum number of links, the dialog did not open but a message indicated that fact. This error has been fixed. **(17769)**

Procedure Sequence

- Warning when overwriting skim matrices: When calculating PuT skim matrices, a warning that matrix files will be overwritten will only be issued if data is actually overwritten. **(17816)**

PuT Assignment

✅ Headway-based assignment with PuT-Aux and specific origin start time: A crash no longer occurs when calculating a headway-based PuT assignment if one of the demand segments includes a transport system of the type PuT-Aux and a specific origin wait time is defined in the perceived journey time. **(17911)**

✅ Ride distance at zone and PuT assignment statistics: The 'mean ride distance' and 'total ride distance' (including variants) at the zone and in the PuT assignment statistics was based on ride distance within the timetable based PuT, but not on PuT-Aux or Vehicle Sharing trips. This bug has been fixed. **(17656)**

Schematic Line Diagram

✅ Indication of units: The units in the graphic parameters of the schematic line diagram were not indicated correctly. This error has been fixed. **(17767)**

Subnetwork Generator

✅ Path sequence sets and path sequence activities: The generation of a subnetwork used to fail in networks that contained path sequence sets and path sequence activities. This error has been fixed. **(17832)**

Visum Files

✅ External matrices in version file: Occasionally, external matrices that were open in the matrix editor were saved to file when saving a version file. This led to the generation of version files that could not be read in again. This error has been fixed by skipping such external matrices that were saved by mistake when reading in version files. **(17887)**

✅ Version files with matrix histogram: Reading in version files that contained an opened matrix histogram failed if no classification matrix was selected in the histogram. This error has been fixed. **(17864)**

🛑 Breaking Changes

PuT Assignment

🛑 Modification of Passenger trips unlinked calculation: The meaning and thus the values of the 'Passenger trips unlinked' and 'Passenger trips unlinked' DSeg attributes of lines, routes and operators have been changed. A path that uses multiple vehicle journeys of the same line, the same line route or the same operator is only counted once and not once every time. At the level of the travel time profiles and vehicle journeys, the same procedure has already been used. The modification will change the values of these attributes. For technical reasons, the affected attributes contain the value 0 after loading a version file written with PTV Visum 16 or earlier. In order to obtain the correct values, the PuT assignment with PTV Visum 17 must be executed again. **(11626 ➕)**

Demand Procedures

🛑 Use of multimodal paths in P+R: The procedures 'P+R lot choice' and 'P+R leg split' now exclusively use multimodal paths to save and output P+R relations. This reduces memory consumption and the distribution of the demand of a relation to the P+R lots can be retraced.
In the 'P+R leg split' procedure, the updated demand from mode choice is no longer redistributed, but the demand matrices are derived from the path sequences generated during 'P+R lot choice'. Volumes are thus balanced yet stem from the last iteration of the demand model. If the demand model is converged, theoretically this should not make a difference; de facto, different procedure results are produced. To update the volume, a second lot choice procedure must be inserted right before the leg split procedure (and after mode choice). In this case, you do not have to save path sequences in the first lot choice procedure, because this is executed only to calculate the skim matrices for the mode choice. In return, the volumes and the distribution to the different P+R lots are then in equilibrium. **(17286 ➕)**

🛑 Weight for P+R vol/cap ratio: The skim calculation and the distribution of the demand now consistently consider the factor for the weight for P+R vol/cap ratio. So far, a factor of -1 was assumed for the distribution. This error has been fixed. The results of the distribution of P+R lots change if the default value -1 for the factor is changed. **(17358)**

Graphics

🛑 OSM Cycle Background Map has been removed: The OpenStreetMap (Cycle Map) map service has been removed from the installation, due to the introduction of API keys for personal authentication at the provider thunderforest.com.
Version files that refers to this map service start without a background map. The map service can still be used if added manually (manual 24.7.1) and corresponding personal registration at http://www.thunderforest.com/docs/apikeys/ **(17880 ➕)**

PuT Assignment

- ⚠ Modelling of roundtrip systems: The modelling of roundtrip systems with in Vehicle Sharing is now possible. The calculation of the load dependent impedance on picked up vehicles is analogously to the calculation on stations. An attribute is introduced to model the minimum dwell time in the zone. The load dependent network impedance and the balance factor on zones were removed. If a assignment under consideration of Vehicle Sharing System has been calculated, the results will now change. **(16893 ⊕)**
- ⚠ Ride distance at zone and PuT assignment statistics: The 'mean ride distance' and 'total ride distance' (including variants) at the zone and in the PuT assignment statistics was based on ride distance within the timetable based PuT, but not on PuT-Aux or Vehicle Sharing trips. This bug has been fixed. In networks with such traffic systems, this changes the values of the zone attributes as well as the PuT assignment statistics. **(17656)**

Data Model

- ⚠ Modification of Passenger trips unlinked calculation: The meaning and thus the values of the 'Passenger trips unlinked' and 'Passenger trips unlinked' DSeg attributes of lines, routes and operators have been changed. A path that uses multiple vehicle journeys of the same line, the same line route or the same operator is only counted once and not once every time. At the level of the travel time profiles and vehicle journeys, the same procedure has already been used. The modification will change the values of these attributes. For technical reasons, the affected attributes contain the value 0 after loading a version file written with PTV Visum 16 or earlier. In order to obtain the correct values, the PuT assignment with PTV Visum 17 must be executed again. **(11626 ⊕)**

17.00-03 [123950]

2017-08-29

⊕ New Features and Changes

Lists

- ⊕ Create new network objects: Lists in which the creation of new network objects (e.g. Path sequence sets, Storyboards) is possible have got new buttons and menu entries, respectively, for the creation, editing and deletion of objects. **(17677)**
- ⊕ Grouping and aggregate functions for path sequences: Grouping with the corresponding aggregate functions is now available in lists of path sequences and path sequence items. **(17815)**
- ⊕ Sorting in lists 'Path sequences' and Path sequence items': The lists 'Path sequences' and Path sequence items' can now be sorted for arbitrary columns. **(17760)**

Main Window

- ⊕ View-specific menu for the network editor: If the network editor is the active view, in the menu the view-specific menu 'Network editor' is shown. Entries in this menu refer to functionality which is available via icons in the network editor too. **(11291)**

Timetable Editor

- ⊕ Sorting in the tabular timetable editor: The tabular timetable editor maintains its sorting of displayed vehicle journeys as long as the number is reduced either by changing the line selection or by other changes of the data. If the number of displayed vehicle journeys increases, the new vehicle journeys are added at the end and all other vehicle journeys remain in sorting order. **(17649)**

✓ Fixed Bugs

Dialogs

- ✓ Edit valid day when using an annual calendar: The dialog 'Edit valid days' did not show vacation days when the dialog were displayed for an annual calendar. This error has been fixed. **(17753)**
- ✓ Labels in the parameter dialog of line blocking: In the parameter dialog of the procedure 'Line blocking' some labels could not be read completely in some languages. This error has been fixed. **(17781)**
- ✓ Pocket lane length within ICA calculation: The option 'Use the pocket length for the determination' in the 'General procedure settings' under 'Node impedance calculation (ICA)' - 'Signalized' was not greyed out when the selected calculation method did not consider this option. This error has been fixed. **(17762)**
- ✓ Procedure parameter dialog 'EVA weighting': The subdialog 'Define assessment types' of the EVA weighting parameter dialog did not show correctly when changing size, in particular with regard to the buttons 'Create' and 'Delete'. This error has been fixed. **(17732)**

Graphics

- ✅ Classified display for control types: When using the classified display for the node attribute 'Control type' the automatic setting of symbols for each class did not work anymore. This bug has been fixed. **(17823)**
- ✅ Display of turn volumes for main nodes: The program does not crash anymore when for the display of turn volumes the alignment is set to 'Sum per bar'. **(17797)**

I/O Interfaces

- ✅ Infinitive loop when importing SATURN data: The SATURN import does not end in an infinitive loop when a sector appears in section 5 of the import data. **(17755)**
- ✅ Infinitive loop when importing SATURN data: The SATURN import does not end in an infinitive loop when comments of less than 6 lines exist in section 1 of the import data. **(17819)**
- ✅ Permitted transport systems for railML export with infrastructure: The railML export with infrastructure exports all PuT line transport systems of the link as 'AllowedCategories' and not only those with an actually exported vehicle journey of the link. **(17785)**
- ✅ Using 'PuT supply from Visum ..' with filter: Line routes with line names similar to a name of a line in the target network were not imported If the option 'Only transfer active vehicle journey sections (and corresponding basic data) from source network' is used for the import and a filter is applied in the source network which directly or indirectly contains a condition in relation to the Line-Name. This error has been fixed. **(17696)**
- ✅ railML Import: Invalid data structures could arise if several consecutive OPC of a 'train' in the railML data cannot be allocated to stop points. As a consequence the railML import was aborted or the program could crash. This error has been fixed. **(17800)**

Matrix Editor

- ✅ Undo and restore: The program does not crash anymore when zones are aggregated followed by undo and restore actions while the matrix editor is open. **(17700)**

Network Editor

- ✅ Merge points of the same coordinates: Merging points with the same coordinates did not work when coordinates were of huge numerical values. This error has been fixed. **(17704)**

Other Procedures

- ✅ Procedure 'Edit attribute' with subattribute: If in the procedure 'Edit attribute' the target attribute is a subattribute this information was lost when closing the dialog. As a consequence the procedure could not be executed. This error has been fixed. **(17751)**

PrT Assignment

- ✅ Approach capacity for Kimber roundabouts: Within the assignment with ICA the definition of the minimum capacities for turns was ignored when the approach capacity of the link for Kimber roundabouts was defined. This error has been fixed. **(17794 🛑)**
- ✅ Reset attributes when initializing assigment with ICA: If there is no result of 'Assignment with ICA' procedure in the network, nevertheless some attributes of net objects depending on assignment with ICA were not set to default values. This bug has been fixed. **(17737)**

Procedure Sequence

- ✅ Messages from procedure sequence execution: If a procedure is executed in single step mode, messages were not replaced but appended to those from the previous execution. Consequently, the number of messages in the procedure sequence dialog did not match the number of visible messages in the message window. This error has been fixed. **(17701)**

PuT Operating Indicators

- ✅ Calculation of transport performance of territories for analysis time intervals: The program does not crash anymore when calculating transport performance for territories per analysis time interval if a link is traversed twice and the first crossing is outside the analysis time interval considered. **(17752)**

Schematic Line Diagram

- ✅ Crash when changing between pages of the graphic parameter dialog: The program does not crash anymore when changing from the dialog page 'Labeling forms' to the dialog page 'Labeling variants' and one is editing a cell of the 'Labeling forms' table. **(17572)**

Subnetwork Generator

- Crash after Subnetwork generation with a matrix: The program does not crash anymore when opening a new network after a subnetwork with a matrix for at least one demand segment has been generated. **(17750)**

Timetable Editor

- Synchronization and sorting: When sorting objects in the tabular timetable editor and then e.g. a vehicle journey item is marked, the synchronization of that element was incorrect. This error has been fixed. **(17395)**

ⓞ Breaking Changes

PrT Assignment

- Approach capacity for Kimber roundabouts: Within the assignment with ICA the definition of the minimum capacities for turns was ignored when the approach capacity of the link for Kimber roundabouts was defined. This error has been fixed. Assignment results of assignment with ICA can change if Kimber roundabouts are included in the network. **(17794 ⊘)**

17.00-02 [123159]

2017-08-04

⊕ New Features and Changes

Data Model

- Relations of PuT path and PuT path leg to connecting journeys: New relations of PuT path permit access to all connecting journeys used by the path. Furthermore, you can use a new relation to access the corresponding connecting journey of a PuT path leg. The relations only provide results if assignment results are saved as connections and the respective connecting journey objects exist (i.e. the maximum transfer times for connecting journeys are long enough). **(17610)**
- Simultaneous allocation of detectors to nodes and count locations: A detector can now be allocated to both a node as well as a count location (and thus indirectly to a link). A consistency of the two allocations is not required. **(15847)**

I/O Interfaces

- Sharing stations in OpenStreetMap import: Some of the provided configurations now also import Sharing stations during OpenStreetMap imports (Car sharing and Bike sharing). **(15963)**

Main Window

- Country setting for regionalized start page: The contents of the start page may differ depending on the country, for example regarding event information. A country setting in the user preferences now allows an explicit selection of the region. (However, the start page does not feature regional differences during the beta test.) **(17711)**

Procedure sequence

- Finishing an iteration step before 'Cancel': Some iterative procedures allow to complete the running iteration when canceling the procedure to issue a consistent (yet possibly not converged) result. This option is now provided directly in the process dialog of the procedure, alternatively to canceling without completing the current iteration step. **(17673)**

Safety

- Calculation of accident rate for main nodes: Accident rates for historical accident data can now also be calculated for main nodes, consistent with the Accident Prediction Model APM. **(16045)**

Subnetwork Generator

- Aliases in the subnetwork generator: Aliases are now included when exporting a subnetwork, i.e. they are also available in the subnetwork after the export. **(17560)**

⊘ Fixed Bugs

Add-Ins

- ✅ Message in case of non-existent file selection: If, for an Add-In, no file was selected as input or output file, a detailed error message is now issued indicating the input error. **(17708)**
- ✅ Possible crash in 'Generic Accident Model': A crash no longer occurs when running the add-in 'Generic Accident Model'. **(17744)**

COM-API

- ✅ Academic program version via COM: The academic program version of PTV Visum can now be started via COM again. **(17085)**

Data Model

- ✅ Deleting a zone allocated to a POI: If you deleted a zone that was allocated to a node, the data model did not react correctly. As a consequence, amongst other things, version files could not be saved any more. **(17713)**
- ✅ Skims of paths and relations with Sharing: The skims Ride time, Journey time, Journey distance, and PuT Aux distance at PuT paths and PuT relations, as well as in the complete statistics and the zone statistics (not all of them at every object) did not properly take into account the path legs traveled by Sharing transport systems. **(17614)**

Dialogs

- ✅ Fill style for marked point-polygonal objects: In the graphic parameters dialogs for marked point-polygonal objects (e.g. zones), the control for the fill style was in the wrong place, so that it looked like it belonged to the 'Draw chart' option. This error has been checked. **(17716)**
- ✅ Focus on input field in modal search dialog: The modal variant of the search dialog (e.g. used for local filters in lists) now also provides a direct focus on the input field when opened, so that you can enter the search criterion right away. **(17534)**
- ✅ Initial column widths in filter dialog: The 'Edit filter' dialog displayed column widths that were not in accordance with the size of the dialog when opened for the first time. This error has been fixed. The modification takes effect with a new installation or when executing function 'Reset table settings' from the View menu. **(17699)**
- ✅ Labeling formats for bars: The 'Label' tab of the graphic parameters dialog for single bars ('Edit bar') used to display control elements for the display format that did not match the type of the selected attribute. This error has been fixed. **(17717)**

Graphics

- ✅ Invalid values for class limits of classified graphic parameters: So far, classified graphic parameters could be generated with invalid values in different ways. This is now reliably prevented. **(17749)**

Main Window

- ✅ Message bars for scenario management and stop sequence in case of high DPI: If a high DPI setting is used, the message bars for scenario management and the stop sequence are dimensioned incorrectly, so that some buttons might not be displayed. This error has been fixed. **(17725)**

Network Editor

- ✅ Aggregating line routes by a vehicle journey attribute: When aggregating line routes and grouping the line hierarchy by a vehicle journey attribute in the course of this, canceling a disaggregation or aggregation step (either by the user or due to a coupling that could not be restored) could cause a crash. This error has been fixed. **(17739)**

PrT Assignment

- ✅ Message regarding the blocking back model with no network object reference: If the blocking back model could not be executed because the remaining capacity of a network object was too low, the message provided contained the wrong network object number in some languages. This error has been fixed. **(17754)**
- ✅ Reset attributes when initializing assigment with ICA: If there is no result of 'Assignment with ICA' procedure in the network, nevertheless the link attribute 'Approach capacity for assignment with ICA' was not set to default values. This bug has been fixed. **(17714 ⛔)**

PuT Assignment

- ✅ Skim matrix calculation after renaming a transport system: A crash no longer occurs when calculating a PuT skim matrix if you used a skim with subattribute transport system (e.g. In-vehicle time TSys or In-vehicle distance TSys) and renamed the transport system after setting the parameters. **(17554)**

PuT Passenger Survey

✅ Stay on board in case of blocked walk links at stop areas: If two path legs existed in multiline survey data format between which a stay on board was possible (i.e. the transition turned into a passenger trip chain) and the transition time at the respective stop area was 24h (i.e. the transition was blocked), the total path received the status 'Unplausible: Required walk link not found', even though the transition at the stop area was not used because of the onward journey. This error has been fixed. **(17721)**

Schematic Line Diagram

✅ Edit course in connection with shortened vehicle journeys containing several vehicle journey sections: No more crash when editing the course of a line route, if one of its time profiles contains a shortened vehicle journey that has two vehicle journey sections and that is currently depicted in a schematic line diagram. **(17710)**

Timetable Editor

✅ Changing the status of an item in the line or line block selection tree via the space key: If you pressed the space key while an item in the line selection tree was marked (both in the 'Base line selection' dialog and the tool window 'Timetable lines'), the tick in the box was removed, yet the actual line selection did not change. Above all, the change did not affect subordinate elements. The same applied to the tool window. The error has been fixed. **(17686)**

✅ Restoring a tabular timetable with switched-off symbols: A crash no longer occurs when restoring a tabular timetable from a version file if all symbols are switched off in the graphic parameters of this tabular timetable. **(17742)**

✅ Sorting in tabular timetable: Running the procedure no longer leads to a crash if the vehicle journeys in the tabular timetable were previously sorted. **(17709)**

Visum Files

✅ Empty values in user-defined attributes: If you read in version files saved with Visum 16 or earlier, which included user-defined attributes of a type that does not allow empty values (e.g. text of file), empty values contained in the file were set to the default value. If this default value was not the empty string, the behavior changed, because so far, empty values of these types were implicitly interpreted as empty strings. Now, empty values of such types found in the version file are always turned into empty strings, independently of the default value set for the user-defined attribute. **(17715)**

⛔ Breaking Changes

PrT Assignment

⛔ Reset attributes when initializing assigment with ICA: If there is no result of 'Assignment with ICA' procedure in the network, nevertheless the link attribute 'Approach capacity for assignment with ICA' was not set to default values. This bug has been fixed. This affects the result of an assignment with ICA using the option 'Use current assignment result as initial solution', if a former assignment with ICA has been initialized. **(17714 ✅)**

| **17.00-01 [122203]** | **2017-07-11** |

⊕ New Features and Changes

COM-API

⊕ Loading and saving global layouts: You can use new methods at IWorkbench and IVisum to load or save global layout files. **(17469)**

Data Model

⊕ Relation from PuT transfers to stops and stop points: A new relation has been added from the object PuT transfers (visible in the 'Passenger transfers stops / time profiles' list) to the From- and To-stop as well as to the From- and To-stop point. **(17644)**

Main Window

⊕ 'Edit' menu always the same: The 'Edit' menu of the main window of PTV Visum now always offers access to the available functions of all network object types, independently of the network object type currently selected for editing. **(17120)**

⊕ Drop-down list for global layouts: The toolbar of the main window provides a drop-down list that enables users to load existing global layout files from the current project directory and to save the current layout as global layout file, analogous to the existing drop-down lists, e.g. for graphic parameter files and filter files. **(17468)**

PuT Assignment

⊕ Output attributes for Sharing at PuT paths and OD pairs: At PuT paths, new attributes are provided, which output the total of the egress penalties and access penalties of all Sharing path legs. These attributes and Sharing travel time and Sharing distance were also added at OD pairs. **(16761 🛑)**

Visum Files

⊕ Specific list settings in global layout: In the global layout file, specific list settings are now also saved. They go beyond the general specifications (such as column selection, aggregation, and analysis rows), i.e. in case of some lists, individual filters and further options will be saved. **(17617)**

✅ Fixed Bugs

Data Model

✅ Delete transport system when there are time-varying attributes: If an attribute of type 'transport system set' is marked as being time-varying and if there are concrete time-varying values for this attribute, then deleting a transport system damages the data model in a way that no version file can be saved any more. This bug has been fixed. **(17577)**

Dialogs

✅ Access to Graphic parameters dialog via 'Network' tool window: If you opened the Graphic parameters dialog via a shortcut menu entry in the shortcut menu of the network objects of the 'Network' tool window, in most cases, the Graphic parameters dialog did not open at the corresponding page but at any other page. This error has been fixed. **(17620)**

✅ Crash in 'Alias' dialog: Selecting a network object type in the 'Alias' dialog no longer causes a crash. **(17683)**

✅ Crash in graphic parameters dialog for lane allocations: A crash no longer occurs when opening page 'Lane allocation > Display' in the graphic parameters dialog of the network editor. **(17676)**

✅ Cross-section logic for user-defined attributes: If you changed the cross-section logic for one of the network object types occuring in pairs (such as links and connectors) in the 'Edit user-defined attribute' dialog, the changed value was not saved. This error has been fixed. **(17585)**

✅ Editing a sharing station deletes results of assignment: If you closed the 'Edit sharing station' with OK, an existing PuT assignment result would be deleted even if no changes were made in the dialog. This error has been fixed. **(17567)**

✅ Editing the name of a line route from Timetable lines: If you called the Edit dialog for a line route from the line selection of tool window 'Timetable lines' and changed the name of the line route first, subsequently clicking the 'Edit course' button closed the dialog but did not lead to the display of the dialog to edit the course. This error has been fixed. **(17550)**

Graphics

✅ Overlapping labels of line bars: The labels of line bars were all drawn at the same position, so that they overlapped. This error has been fixed. **(17637)**

Lists

✅ Path lists with origin zone filter: If you saved a version file with an open path list for which an origin zone filter has been set, this filter was not restored correctly when reading in the version file and restoring the list view, i.e. it was displayed on the button but had no effect on the contents of the list. This error has been fixed. **(17630)**

Main Window

✅ Window title of the schematic line diagram: The window title of the schematic line diagram was displayed incorrectly when restoring the schematic line diagram during a version file import, yet was updated during later actions. This error has been fixed. **(17623)**

Network Editor

✅ Editing surfaces in case of very large surfaces with shared points and edges: Moving a polygon point of a surface also used to be very slow if the surface shared a polygon point or an entire edge with a different very large surface but not the moved point or edge on which it was located. This error has been fixed. **(17579)**

- No progress when renumbering zones: When renumbering zones in a way that the order of zones is changed in a network containing several matrices, there was no progress information, although the action taking a while to complete. As a consequence the PTV Visum application seemed to have crashed. This error has been fixed. **(17692)**

PuT Operating Indicators

- OD pair filter in transport performance per territory: When calculating the transport performance for territories in the context of the 'PuT Operating Indicators' procedure, the OD pair filter had no effect on the indicator 'PTripUnlinked'. If indicators were calculated additionally for analysis time intervals, the OD pair filter had no effect on passenger kilometers, passenger hours, and variations thereof either. This error has been fixed. **(17059)**

Timetable Editor

- Tabular timetable too slow: The tabular timetable responded too slowly to changes of the line selection. This error has been fixed. **(17688)**

Visum Files

- Image section of graphical timetable and global layout: The image section of the graphical timetable was not restored when reading in a global layout file. **(17654)**
- Reading attribute files deletes ticket types: Reading an attribute file containing attributes of lines (or pasting data into the 'lines' list) deleted certain ticket types. This bug has been fixed. **(17655)**
- Version files with a cycle time smaller than the green time start/end: You could edit the data of stage-based signal controls in such a way that the cycle time of the SC was smaller than the green time start or the green time end of a stage. Version files could be saved in this condition, but not be read in again. This error has been fixed. **(17586)**

⊘ Breaking Changes

PuT Assignment

- ⊘ Output attributes for Sharing at PuT paths and OD pairs: At PuT paths, new attributes are provided, which output the total of the egress penalties and access penalties of all Sharing path legs. These attributes and Sharing travel time and Sharing distance were also added at OD pairs. **(16761 ⊕)**

17.00-00 [121769]	**2017-06-27**

⊕ New Features and Changes

ANM

- ⊕ New attribute ANM node number: The attribute shows the node number that is used in ANM for a node and main node, respectively, and that is used as a reference for the ANM import in Vissim. **(17355)**

Add-Ins

- ⊕ General Transit Feed Import: If the date filter is active for the import, the dialog is set per default to the first entry of the calendar.txt file. **(16534)**
- ⊕ General Transit Feed Import: In addition to the traffic system defined in the standard, a mode 'PuT' and a demand segment 'PuT' are also created and linked during the import. **(16533)**
- ⊕ OD- Import: The Add-In 'OD- Import' reads csv files and import OD based datasets. The given data will be summarized in demand and skim matrices and is immediately available within PTV Visum. **(16390)**

COM-API

- ⊕ Aggregating Zones or Territories: Zones and Territories can be aggregated by any given attribute. The COM Interface is extended by the method 'AggregateSurfacesByAttribute' at IZones and ITerritories. **(16604)**
- ⊕ Create connectors: Under INet a new method for creating connectors for multiple OD pairs ('CreateODConnectors') is offered. **(14957)**
- ⊕ Deprecated methods for matrices removed: The methods AddODMatrix, AddSkimMatrix, RemoveODMatrix, RemoveSkimMatrix were marked as deprecated in Visum 16 and are removed now. **(15724 ⊘)**
- ⊕ Extensions to COM for multimodal applications: COM access is available to lists of objects for multimodal applications, to graphic parameters and to the definition of skim matrices for path sequences. **(17304)**

- ⊕ Filename of the version file: The full filename of the currently loaded version file can now be determined through the new readonly property Visum.IO.CurrentVersionFile. This information was so far accessible through Visum.UserPreferences.Document name. This property will be preserved parallel to the new one. **(16809)**
- ⊕ Filtering objects by expression: A new generic property FilteredBy(<formula>) available on all container objects returns a subset of the container containing all objects for which the passed formula (string value, same syntax and semantics as in the formula editor for user-defined attributes) results in true (if bool) or non-zero (if numerical). **(17291)**
- ⊕ In VBA, the command "Option base 1" (to use 1-based Arrays) works now correctly for the methods GetMultipleAttributes, SetMultipleAttributes and SetMultiAttValues. (The command still doesn't affect GetMultiAttValues - here, the Array is always 0-based.) **(16674 🔴)**
- ⊕ New Identifiers for procedure and commands: The procedure 'Demand matrix correction (TFlowFuzzy)' is renamed to 'Demand matrix correction'
  The COM class 'ITFlowFuzzyPara' is renamed in 'IDemandMatrixCorrectionPara'. This also includes their derivations. The method 'TFLowFuzzyParameters' co-exists with the new method 'IDemandMatrixCorrectionPara, but is marked as deprecated and won't be available in the next releases. **(17227 🔴)**
- ⊕ New option when reading general procedure settings: A new option 'Reset general procedure settings prior to reading' is available when reading general procedure settings. If this option is active, values are set to their defaults prior reading. For reading the general procedure parameters with the new parameter a new COM method 'OpenXmlWithOptions' has been added. **(17141 🔴)**
- ⊕ Specification of column layout for saving various file types: Various functions used for exporting data from Visum to external files now allow to configure the tables and columns exported directly through the COM-interface instead of requiring to use layout files. This facilitates e.g. to include project-specific POI-categories or UDAs in the exports. The functionality is exposed through new methods such as Visum.IO.SaveNetUsingLayout, Visum.IO.SaveDemandFileUsingLayout, Visum.IO.SaveAccessDatabaseUsingLayout, Visum.IOSaveToMsSqlServerDatabaseUsingLayout and similar functions for version comparisons. All these methods require to pass a ITableAttrSelection-object which describes the table and column layout. Create a new empty object through Visum.IO.CreateTableAttrSelection and then use its methods to configure the layout. **(17220)**
- ⊕ Update of the Python libraries: The Python libaries installed with PTV Visum in Folder PythonModules were updated to the most recent compatible versions. The new versions are
  omx
  dateutil 2.6.0
  matplotlib 1.5.3
  pyparsing 2.2.0
  numexpr 2.6.2
  numpy 1.12.0
  osgeo
  pyproj 1.9.5.1
  pytz 2016.10
  tables 3.3.0
  pandas 0.19.2
  wyPython 2.9
  Custom scripts should be checked for compatibility with these versions. **(16220)**

Data Model

- ⊕ Attribute 'File extension' for skims: The attribute 'File extension' for skim matrices has been renamed in 'Code'. **(17071)**
- ⊕ Extension for multimodal application: The Visum data model has been extended for multimodal applications. Consequently new objects are available such as path sequence sets, path sequences, path sequence items and path sequence activities. These objects are accessible via corresponding lists. Synchronization and graphic parameters have been extended too. **(16343)**
- ⊕ Operating periods: When using the annual calendar, it is possible to enter an operating period. This period divides the calendar in individual time periods (e.g. school holidays, summer, winter,…) Now, not only valid days (e.g. weekdays), but also operating periods can be specified for vehicle journey sections. This allows a massive reduction in valid days. Additional functionality provides the conversion of existing valid days in introduced operating periods. **(16416)**
- ⊕ Serving Vehicle Journeys: At stop points, a new relation to serving vehicle journeys is established. Serving vehicle journeys are defined as journeys, which allows boarding or alighting at the stop point. With this relation it is easy to calculate the number of active journeys at one stop point. **(16448)**
- ⊕ User defined Attributes: For non-persistent network objects formula- based user defined attributes can be created. Non-persistent network objects a for instance PrT paths, PuT path legs, path sequences, connecting journeys or OD pairs. Because this objects not always exists, only the formula definition of the user defined attribute is stored. **(17297)**
- ⊕ User-defined Attributes: When creating a number- or bool based user defined attribute, it's possible to allow or prohibit the usage of empty values. **(16597)**

- Line blocking: The Attributes 'ScheduledBlockAndBLockingDay' and 'ScheduledBlocksAndBlockingDaysWithinBlockingPeriod' combines the Attributes BlockNumber and BlockingDay. This enables the identification of a single vehicle without usage of user defined attributes. **(17292)**
- Network check: If a vehicle journey section is shortened or deleted, that journey items are no longer covered by a journey section, the network check 'vehicle journey items without vehicle journey sections' will find those and correct them if necessary. **(16615)**
- Qualification of values of time-restricted attributes: The individual values of time-restricted values can now be qualified by two additional properties 'Name' and 'AddVal'. Thereby the meaning of the values can be documented. **(16939)**

Demand Procedures

- Calculation of demand matrices from path sequences: A new procedure has been implemented for the calculation of demand matrices from path sequences. **(16980)**
- Optional output of P+R paths as path sequences: The result of the procedure P+R lot choice can optionally be saved as path sequences by demand strata and direction. Once the results are stored in a path sequence set the entire paths can be visualized. **(16984)**
- Distribution of doubly-constrained across demand strata: In the tour-based demand model, for the doubly-constrained calculation, multiple demand strata (e.g. different person groups with the same trip purpose) can compete for the same attraction and exhaust them collectively. Consequently, the distribution of the attraction potential in a zone is a result of the calculation and not anymore implicitly given. The option 'Couple DStrata together' can be set in the demand model Tab 'Activities'. **(12715)**

Dialogs

- Couple / Separate vehicle journey: The identifiers for the vehicle journeys, which will be coupled / separated now contains the name instead of the number. This will simplify the reference. **(16447)**
- Demand data: The order of the tabs are changed in the dialog 'OD demand data'. It now starts and open with the tab 'demand segments'. **(16492)**
- Dialog network settings: The dialog network setting have been reorganized and the numbers of tabs is reduced. The clarity has been improved. **(13694)**
- Display of main activity for rubberbanding: A new column 'Activity chain with main activity' is displayed in the procedure dialog for the Tour-based model - Combined trip distribution/mode, Tab 'Rubberbanding'. The cells are colored if the main activity is not defined for the activity chain. **(17397)**
- Edit / Create Link: Modifications via the dialog 'Create Link' or 'Edit Link' can be automatically applied to the opposite direction. Only edited attributes will be modified on the opposite direction. **(16714)**
- Edit flow bundle term: In the dialog 'Edit flow bundle term' on the register 'supply' the buttons 'select all', 'select active ones', 'reset selection' and 'invert selection' provides an easy way to adapt the considered supply. **(16618)**
- Edit line routes: The marking in the dialog u',';Edit Line routes' has been improved. In addition it displays the sum of the marked run times and length. **(16161)**
- Edit surfaces: The functionality for editing surfaces has been removed from the 'Network settings' dialog. The corresponding entries for editing surfaces can now be found under Menu 'Edit'. **(13695)**
- Fuzzy surface alignment: The dialog 'Fuzzy surface alignment' contains to additional options to normalize surfaces and merge all points with identical co-ordinates after execution. Both functionalities are not part of the step 'fuzzy alignment'. **(17138)**
- Graphic parameter dialog of the 3D network view: In order to improve the understanding of the settings, some identifiers were renamed. In addition, it is possible to transfer the settings of classes between classified display and the height bands in the prism display. **(16932)**

Graphical Procedures

- Flow Bundle Analysis: It's possible to duplicate marked terms in the flow bundle definition. In addition, multi selected terms can be deleted in one step. **(16451)**
- Flow Bundle: Multiple new stop and stop point attributes are available to assess the flow bundle calculation. 'Passengers boarding (- at origin) flow bundle', 'Passengers alighting (-at destination) flow bundle', 'Passengers transferring total flow bundle' and 'Passengers transferring direct flow bundle' base their calculation on the current flow bundle. **(16594)**
- PrT- Isochrones: It can be selected whether the selected network objects are origins or destination of the IV isochronous calculation. If the new option 'reference objects are destinations' is selected, the isochrones specifies the locations from which the network object can be reached at the same time. **(10592)**
- PuT- Flow Bundles: The calculation of PuT u'–'; Flow Bundles have been accelerated. **(17467)**

Graphics

- ⊕ Information signs: Information signs are displayed in the 3D network view. These signs depicts user defined text or attributes of the attached network objects. Storyboard actions can dynamically show or hide information signs. **(15898)**
- ⊕ Legend: The parameters for displaying the legend are now directly editable within the network editor. For instance, Headings, Font sizes as well as margins and spacing can be interactively adapted. **(16595)**
- ⊕ Line bars: If some line bars can't be depicted, cause their width is less a pixel, a substitute bar can display the sum of all bars, not depicted and thus guarantee, that the total width is correct. **(16450)**
- ⊕ Link bars: Graphic parameters for link bars and link bar labels are accessible directly from the network editor. Hovering with the cursor above a bar highlights it and after a short delay, a button appears which grants access to the graphic parameters for the highlighted element. **(16596)**
- ⊕ Point objects: Drawing of point objects (e.g. nodes or stop points) can be turned on or off independently from drawing tables or charts. If the drawing option is selected in the dialog 'table' or 'diagram', this is activated in the 'Display' dialog if it was previously deactivated **(16616)**

I/O Interfaces

- ⊕ Routing parameters in railML import: The import from railML now offers the same options for the routing of items through the existing network as in network reading etc. **(16449)**
- ⊕ railML-Export: The infrastructure export now takes different modes for link selection into account: Export all links; export all links needed for active vehicle journey sections; export all links, needed for active vehicle journey sections and active links additionally. **(17171)**
- ⊕ railML-Export: The railML- Export supports the makroscopic representation of the infrastructure in railML 2.2. **(16693)**
- ⊕ railML-Import: The railML-Import is able to import line blocks. In this case, the import expects datasets including line blocks as well as vehicle journeys. **(4868)**
- ⊕ Import of ferries from OpenStreetMap: The OSM import now also imports ferry connections into Visum networks. **(16543)**

Installation

- ⊕ CodeMeter Runtime: The CodeMeter Runtime is updated to the most recent version 6.50a. **(17574)**
- ⊕ Support for Windows Vista ends: PTV Visum 17 officially does not support Windows Vista anymore. **(17393)**

Junction Editor

- ⊕ Vissim-Preview: The Vissim-Previewer is now based on PTV Vissim 10. **(17405)**

Lists

- ⊕ New aggregation functions: New aggregation functions are available: 'First' / 'FirstActive' returns the first element of a concatenation. 'Last' / 'LastActive' returns the last element. The function works within grouped lists as well as for indirect attributes. **(16501)**
- ⊕ Path lists: The search for paths in path lists is improved. The entry of the origin zone in the search dialog is synchronized with the origin zone filter of the list. The lists PrT Path, PrT path on link level, PuT OD pairs, PuT paths and PuT path legs are benefit from this. **(16453)**
- ⊕ Selection in Combo- Boxes: It's possible to select an element within a combo box using the keyboard. The according element is marked after the swift entry of the first characters. **(16593)**

Main Window

- ⊕ Help Menu: In the help menu two new entries appears. 'Introduction to the Visum COM-API' u'–'; This document gives a quick start in using the COM Interface. 'Open documents directory' u'–'; This links to helpful documents, like an overview document or release notes, which comes with every installation. **(17115)**
- ⊕ Menu bar: In the menu bar item 'Edit' the entry 'Matrices' gives access to insert and edit matrices. It also insert, create and open external matrices. **(11828)**
- ⊕ Menu bar: The entry 'Print' and 'Export graphic' is always located in the menu bar item 'File'. It refers to the current active window and is named accordingly. **(12175)**
- ⊕ Menu bar: The items set window section, zoom, previous window section, display entire network are now always visible in the menu 'View' and greyed out if not available. The functionality next section, refresh, set section to print area, measure distance mode, move window section mode, as well as the column chart functionality are exclusively available in the toolbars. **(17064)**
- ⊕ Menu bar: The items to open the views procedure sequence, 3-D network view, Timetable (tabular, graphical, both) line block editor, schematic line diagram, transfer display of regular services, signal time-space diagram have been moved from the menu 'Edit' to 'View'. Additional items to open the matrix editor, matrix histogram and matrix comparison have been created und replace the item matrix editor in the menu 'Edit' **(16908)**

- Messages and warnings: The handling and output of messages and warnings has been revised. The messages are now grouped by their source (e.g. procedures, file import) in the message window, and only the relevant messages from the last action are displayed. All other outputs are still listed chonologically in the log files. Where possible, multiple message dialogs shown during a single action have been replaced by a single link to the message window displayed at the end of the action. **(15720)**
- New file for global layout of a model: It is now possible to save the global aspects of a model in a new file type called global layout and transfer them to another version file. This global layout file contains window positions, filter settings as well as graphic parameters and layouts of all open windows in a version file. **(10104)**
- Notification about new Service Packs: With the program start, it is checked whether a newer program version is available. If this is the case, a notification appears in the main window and on the start page. This provides direct access to the download area. This functionality is only available with internet access. **(17563)**

Matrix Editor

- Copy to Clipboard: It's now possible to copy the data to the clipboard even if multiple matrices are depicted in the editor. **(9771)**
- External matrices: Searching for identifiers is enabled also in external matrices. **(16455)**
- Multidimensional evaluation in matrix histogram: When creating a matrix histogram it is possible to add multiple classification matrices (e.g. journey time and number of transfers). In the graphical display one can change between the corresponding displays. In the list display of the histogram there is an additional list that contains all possible combinations of classes and the corresponding evaluations. **(16454)**

Matrix Estimation

- Calculation of flow matrix: The calculation of the flow matrix has accelerated considerably. The flow matrix serves as the basis for matrix estimation. **(16769)**
- Method of least squares: For the procedure 'Demand matrix correction' an alternative solution algorithm has been implemented. It is the method of least squares which in contrast to TFlowFuzzy always produces a solution. **(6725)**
- New Identifiers for procedure and commands: The procedure 'Demand matrix correction (TFlowFuzzy)' is renamed to 'Demand matrix correction'
  The COM class 'ITFlowFuzzyPara' is renamed in 'IDemandMatrixCorrectionPara'. This also includes their derivations. The method 'TFLowFuzzyParameters' co-exists with the new method 'IDemandMatrixCorrectionPara, but is marked as deprecated and won't be available in the next releases. **(17227 ⛔)**

Miscellaneous

- Transfer display of regular services: The synchronization of the transfer display has been improved. The selection of the service groups now marks the according vehicle journey elements and not the vehicle journeys anymore. **(15748)**
- 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 unify the scaling of bars across multiple layers; new attributes for labelling the service groups are available; through passenger edges and a new transfer display mode as well as the functionality to switch to the next time interval has been introduced. **(16599)**
- User preferences: The option 'Use AP as preset analysis time slot for attribute selection' is now activated by default after installing the application. **(16928)**

Network Comparisons

- Load comparison networks: Only the comparison networks of the current version files are loaded, but not their comparison networks. This prevents circular references and shortens loading times. **(16273 ⛔)**

Network Editor

- Aggregate line routes and time profiles: The conditions for aggregating line routes and time profiles have been extended by considering any given attribute. PuT Supply with the identic attribute values is summarized to a selected higher level. **(16457)**
- Aggregating Zones or Territories: Zones and Territories can be aggregated by any given attribute. The COM Interface is extended by the method 'AggregateSurfacesByAttribute' at IZones and ITerritories. **(16604)**
- Allocation of POIs to network objects: The user interface for managing allocations of POIs to other network objects has been refurbished. The network objects are now selected using the standard search dialog with many search and filter functions. Furthermore, POIs can now also be allocated to zones. **(11504)**

Other Procedures

- Blocking back: Iterations at the start of blocking back are calculated together as long as the limiting capacities are not reached. **(17004 ⛔)**

- Special function for creating lane turns: The Special function 'Create missing lane turns' generates lane turns for two-leg nodes in such a way that for each incoming lane at least one outgoing lane turn exists and each outgoing lane has at least one incoming lane turn. This is recommended for networks where SBA is used. **(17440)**
- Multimodal assignment: A new assignment procedure has been implemented. The assigned demand can use several different modes for the entire paths. **(16342)**

PUT Operational Indicators

- Number of vehicle journey section journeys: For links, line route items and vehicle journey items a new calculated attribute Number of section service trips is available, which contains the number of vehicle journey sections using an object. This facilitatesto evaluate multiple unit tractions. **(16614)**

PrT Assignment

- BFW in Assignment with ICA: The newly implemented PrT assignment procedure Bi-conjugate Frank Wolfe (BFW) is available as subordinate assignment procedure within Assignment with ICA. **(16740)**
- Control type 'unknown' in SBA: In SBA crossing now conflicts at nodes of control type 'unknown' are neglected. **(17437 ⚠)**
- Modeling different speed limits in SBA: For certain link types, e.g. freeways, the effect of different speed limits of transport systems can be approximated using the option 'Use only outermost lane' for the corresponding transport systems. **(17042)**
- Multimodal assignment: A new assignment procedure has been implemented. The assigned demand can use several different modes for the entire paths. **(16342)**
- New PrT assignment BFW: The new PrT assignment procedure Bi-conjugate Frank Wolfe (BFW) has been implemented. **(16463)**
- Warmstart for SBA: For the simulation-based assignment (SBA) it is possible to use an existing assignment result as initial solution for a new simulation-based assignment. **(17041)**

PrT Assignment,PuT Assignment

- Calculation of skim matrices for path sequences: A new procedure has been implemented for the calculation of skim matrices from path sequences. **(16983)**

Procedure Sequence

- New group 'Multimodal' for procedures: A new group 'Multimodal' has been added In the dialog for the selection of procedures. In this group all procedures making use of path sequences can be found. Also P+R procedures have been moved to this group. **(17140)**
- New option when reading general procedure settings: A new option 'Reset general procedure settings prior to reading' is available when reading general procedure settings. If this option is active, values are set to their defaults prior reading. For reading the general procedure parameters with the new parameter a new COM method 'OpenXmlWithOptions' has been added. **(17141 ⚠)**
- Skim matrices for path sequences: In the General procedure settings a new entry for the definition of skim matrices for path sequences has been added. Skim matrices for path sequences can be defined. It is also determined e.g. which skim matrices of subordinate demand segments are considered in the calculation. **(16976)**

PuT Assignment

- Fare calculation: The fare calculation has been further accelerated. The attribute 'Number of fare zones' returns a blank value if the fare structure of the used ticket type is not a zone-based fare. **(16402 ⚠)**
- Multimodal assignment: A new assignment procedure has been implemented. The assigned demand can use several different modes for the entire paths. **(16342)**
- PuT relations analysis: The PuT relations analysis is introduced as a procedure. It derives demand and skim stop area matrices based on the active PuT supply. **(8678)**
- PuT- Aux: The route search in big networks, which contains links that are open for PuT- Aux have been accelerated. **(17347)**
- Runtime timetable- based Assignment: The timetable- based Assignment have been accelerated, if tariff systems with multiple demand segments were used. **(17184)**
- capacity restricted time table based PuT assignment: The convergence oft he procedure is now based on shifts in connection volumes. That applies to smoothing and the terminations condition. The smoothing method is limited to MSA. It is mandatory to merge the results of the first and second connection search. **(16695 ⚠)**
- filter PuT network volumes: The calculation of the filtered PuT network volumes has been accelerated. **(17403)**

PuT Line Blocking

⊕ Line Block Editor: The line block editor can be synchronized by the marking of vehicle journey items in other windows like the tabular or graphical timetable editor. **(17335)**

PuT Operating Indicators

⊕ Distribution of values proportional to capacity: Different options are now available for the distribution of person kilometers/hours to vehicle journey sections when vehicle combinations are used. It can be chosen between
- equal distribution (as before)
- weighted by seat capacity
- weighted by total capacity **(16446)**

⊕ Number of Service Trips: The indicator 'Number of Service Trips', 'Service kilometers' and 'Service time' considers multiple passings of the same vehicle journey. If one journey pass the same link, turn or main turn multiple times, it will also be counted multiple times. **(12421 ⚠)**

⊕ PuT Operating Indicators only for active territories: The PuT Operating Indicators optional consider only the active territories. Indicators of passive territories will be set to '0'. **(16452)**

Safety

⊕ Error messages during data import: The error messages during the import of accident data from CSV with empty column headers have been improved. **(16970)**

⊕ Generation of Accident Prediction Models: A new Add-In allows to estimates parameters for log-linear Accident Prediction Models (APM). Segmentizing variables can be used to generate model variants for all combinations of values. **(16171)**

Scenario Management

⊕ Duplicate of elements: While duplicating scenarios, modifications, procedure parameter set and comparison patterns the entry in code is appended by '-Copy'. **(17076)**

Schematic Line Diagram

⊕ Passenger trip chains: The schematic line diagram is able to display passenger trip chains as well as forced chainings. **(16437)**

⊕ Text: It is now possible to display user defined texts within the schematic line diagram. **(11443)**

Timetable Editor

⊕ Adjustable time range for relevant connections: The time range, which defines relevant connections for a vehicle journey item is now adjustable via the network settings. **(16680)**

⊕ Connecting Journeys: Connecting Journeys connects two vehicle journey items and are represented by logical network objects. This allows depicting reached and missed connecting journeys in lists and including them into synchronisation. **(16465)**

⊕ Selection in Combo- Boxes: It's possible to select an element within a combo box using the keyboard. The according element is marked after the swift entry of the first characters. **(16593)**

⊕ Tabular timetable: The attributes time profile and line route are editable via a drop down selection direct in the tabular timetable. **(14888)**

Visum Files

⊕ Accelerated reading and writing of version files: The reading and writing of version files, especially with many demand strata, has been accelerated **(17263)**

⊕ Import of path sequences: Path sequences can be imported into a Visum model from external sources. The format corresponds to an attribute file of path sequence items in which certain columns are mandatory. **(16986)**

⊕ List layouts: List layouts (*.lla), that have been created with Visum 10.2 or less can no longer be loaded. This layout files have to be imported in Visum 16 or less and can be saved again to preserve their content. **(14724 ⚠)**

⊕ Matrices: Loading and saving of matrices has been accelerated by using a faster method of compression. **(16737)**

⊕ New option when reading general procedure settings: A new option 'Reset general procedure settings prior to reading' is available when reading general procedure settings. If this option is active, values are set to their defaults prior reading. For reading the general procedure parameters with the new parameter a new COM method 'OpenXmlWithOptions' has been added. **(17141 ⚠)**

⊕ Skim matrices for path sequences: In the General procedure settings a new entry for the definition of skim matrices for path sequences has been added. Skim matrices for path sequences can be defined. It is also determined e.g. which skim matrices of subordinate demand segments are considered in the calculation. **(16976)**

⚠ Breaking Changes

COM-API

- Deprecated methods for matrices removed: The methods AddODMatrix, AddSkimMatrix, RemoveODMatrix, RemoveSkimMatrix were marked as deprecated in Visum 16 and are removed now. **(15724 ⊕)**

- Final removal of deprecated methods: Some methods which have been flagged as 'obsolete' if former releases have been removed definitely. Scripts using these methods must be adapted.
  -
  IVISEMDGroupModeModeChoicePara.NumItems
  IVISEMDGroupModeModeChoicePara.ItemByKey
  IVISEMDGroupModeModeChoicePara.AddItem
  IVISEMDGroupModeModeChoicePara.RemoveItem **(17161)**

- In VBA, the command "Option base 1" (to use 1-based Arrays) works now correctly for the methods GetMultipleAttributes, SetMultipleAttributes and SetMultiAttValues. (The command still doesn't affect GetMultiAttValues - here, the Array is always 0-based.) **(16674 ⊕)**

- Removal of deprecated methods: Some deprecated methods were finally removed from the COM-interface. These are:
  - Visum.Net.ODMatrices, Visum.Net.SkimMatrices, Visum.Net.AddSOdMatrix, Visum.Net.AddSkimMatrix, Visum.Net.RemoveOdMatrix, Visum.Net.RemoveSkimMatrix
  - Visum.CreateMatrixTable, Visum.CreateMatrixTableListMode und - Visum.CreateMatrixHistogram (--> Visum.Workbench)
  - Visum.WriteToTrace, Visum.WriteToError
  - Visum.WriteToMessageFile, Visum.WriteToLogFile
  - Flowbundle.Save

  Please adapt scripts using these methods. **(16272)**

Matrix Estimation

- New Identifiers for procedure and commands: The procedure 'Demand matrix correction (TFlowFuzzy)' is renamed to 'Demand matrix correction'
  The COM class 'ITFlowFuzzyPara' is renamed in 'IDemandMatrixCorrectionPara'. This also includes their derivations. The method 'TFLowFuzzyParameters' co-exists with the new method 'IDemandMatrixCorrectionPara', but is marked as deprecated and won't be available in the next releases. Users have to adjust their scripts until the next major release accordingly. **(17227 ⊕)**

Network Comparisons

- Load comparison networks: Only the comparison networks of the current version files are loaded, but not their comparison networks. This prevents circular references and shortens loading times. Comparison networks of comparison networks are not loaded anymore. **(16273 ⊕)**

Other Procedures

- Blocking back: Iterations at the start of blocking back are calculated together as long as the limiting capacities are not reached. These changes in the calculation can result in slightly different results of the blocking back calculation. **(17004 ⊕)**

PrT Assignment

- Assignment with ICA: Numerical problems could result in negative averaged volumes. This bug has been fixed. Consequently, assignment results can change. **(17421)**

- Control type 'unknown' in SBA: In SBA now crossing conflicts at nodes of control type 'unknown' are neglected. This changes the results of SBA. **(17437 ⊕)**

- Determination of ranks for major flows with turn types 1 and 3: The determination of ranks for two-way stop nodes where the turn types of the major flow directions are 1 and 3, respectively, takes the existence of other legs next to the major flow approaches into account. This changes ranks, and consequently, also the conflicts between turn movements can change. This leads to changes of the ICA calculation. Also, the results of an Assignment with ICA and of the simulation-based assignment (SBA) can change. **(15516)**

- ICA calculation for roundabouts: The leg attribute 'ICA Share of bypass volume' has been evaluated also for roundabouts without bypass. This error has been fixed. As a consequence, the ICA calculation results can change as well as the results of Assignment with ICA. **(17283)**

- Initial saturation flow rate for Assignment with ICA: The parameter for the initial saturation flow rate in Assignmnet with ICA has been ignored so far, instead a value of 1800 was used. This error has been fixed. When reading version files of previous release versions a value of 1800 is set, because calculations are based on this value. **(16822)**

⚠ Pocket lanes of different length: The simulation-based assignment (SBA) takes now also pocket lanes into account where the nearer to the origin lane defined pocket is shorter than the one further away. So far, the length of the nearer to the origin lane defined pocket lane has been adjusted. This error has been fixed. Consequently, SBA assignment results can change. **(16561)**

⚠ Share of Bypass volume: The turn volume share which does not use a bypass, but the roundabout has been neglected for the calculation of conflict volumes. This error has been fixed. Consequently, the ICA calculation of roundabouts for which a bypass is defined can change. **(17364)**

Procedure Sequence

⚠ New option when reading general procedure settings: A new option 'Reset general procedure settings prior to reading' is available when reading general procedure settings. If this option is active, values are set to their defaults prior reading. For reading the general procedure parameters with the new parameter a new COM method 'OpenXmlWithOptions' has been added. The default behaviour when reading can change. So far, the general procedure settings were reset when the procedure sequence and the procedure settings were read together and the procedure sequence replaced. **(17141 ⊕)**

PuT Assignment

⚠ Connections influencing preselection in capacity-restrained assignment: The evaluation of connections in the preselection of the second search in capacity restrained assignment is now restricted to only such connections which are only found in this second search. Connections also found in the first search are now longer considered when calculating indicators. This can lead to the selection of different connections and thereby to different assignment results. **(16775)**

⚠ Dominance in Headway- based Assignment: If multiple different 'PuT Aux' - Transport Systems are used and connections exists, which only differ by the usage of these PuT Aux- TSys on the same path leg, the path is dominated by the other one and has been deleted. This error has been fixed. This will lead to different path sets as well as different assignment results in these rare occasions. **(17193)**

⚠ Fare calculation: The fare calculation has been further accelerated. There might be minimal numeric deviations to previous results. The attribute 'Number of fare zones' returns a blank value if the fare structure of the used ticket type is not a zone-based fare. So far, a '0' has been output. **(16402 ⊕)**

⚠ capacity restricted time table based PuT assignment: The convergence oft he procedure is now based on shifts in connection volumes. That applies to smoothing and the terminations condition. The smoothing method is limited to MSA. It is mandatory to merge the results of the first and second connection search. This changes lead to differing connection sets and volumes for user of the capacity restricted time table based PuT assignment **(16695 ⊕)**

PuT Operating Indicators

⚠ Number of Service Trips: The indicator 'Number of Service Trips', 'Service kilometers' and 'Service time' considers multiple passings of the same vehicle journey. If one journey pass the same link, turn or main turn multiple times, it will also be counted multiple times. In former PTV Visum versions one journey was counted just once. **(12421 ⊕)**

Visum Files

⚠ List layouts: List layouts (*.lla), that have been created with Visum 10.2 or less can no longer be loaded. This layout files have to be imported in Visum 16 or less and can be saved again to preserve their content. **(14724 ⊕)**

COM-API

⚠ Global variables in internally executed Python scripts: Global variables created by Python scripts executed from within Visum (e.g. procedures) used to be preserved beyond the execution of the actual script. Thus, they could still be evaluated in successive calls. This behaviour was changed, all varaibles and their contents are now deleted when the script terminates. Scripts which rely on the previous behaviour may need to be adapted. **(17284)**

⚠ New Identifiers for procedure and commands: The procedure 'Demand matrix correction (TFlowFuzzy)' is renamed to 'Demand matrix correction'
The COM class 'ITFlowFuzzyPara' is renamed in 'IDemandMatrixCorrectionPara'. This also includes their derivations. The method 'TFLowFuzzyParameters' co-exists with the new method 'IDemandMatrixCorrectionPara', but is marked as deprecated and won't be available in the next releases. Users have to adjust their scripts until the next major release accordingly. **(17227 ⊕)**

⚠ New option when reading general procedure settings: A new option 'Reset general procedure settings prior to reading' is available when reading general procedure settings. If this option is active, values are set to their defaults prior reading. For reading the general procedure parameters with the new parameter a new COM method 'OpenXmlWithOptions' has been added. The default behaviour when reading can change. So far, the general procedure settings were reset when the procedure sequence and the procedure settings were read together and the procedure sequence replaced. **(17141 ⊕)**

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