

Last modified: 2018-11-05

18.02-02 [136657] 2018-11-02

+ New Features and Changes

Demand Procedures

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

PuT Assignment

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

Visum Files

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

✓ Fixed Bugs

COM-API

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

Data Model, Timetable Editor

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

Dialogs

- ✓ Adapting the attribute selection to a changed preselection: Crashes no longer occur when adapting the attribute selection to a changed preselection (e.g. analysis horizon). **(19232)**
- ✓ Insert all input attributes: No more crash when adding all input attributes to the selection in the attribute selection dialog. **(19240)**

Formulas

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

Formulas, Matrix estimation

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

Formulas, Other Procedures

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

Graphical Procedures

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

Graphics

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

Graphics 3-D

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

Installation

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

Line Blocking

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

Lists

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

Network Editor

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

Other Procedures

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

Passenger Surveys, PuT Assignment

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

PrT Assignment

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

PuT Assignment

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

Schematic Line Diagram

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

Transfers Display of Regular Services

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

Visum Files

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

18.02-01 [136087]

2018-10-09

+ New Features and Changes

Dialogs

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

I/O Interfaces

- + Aggregating optional with GTFS: When importing a General Transit Feed (GTFS), aggregating the resulting line routes is now optional. **(19096)**
- + Aggregation of line routes accelerated: The aggregation of line routes has been accelerated for many constellations. This applies both to the special function in the network editor and especially to aggregation in the context of the GTFS import. **(19097)**
- + Link stop points traversed multiple times when updating PuT supply: When importing a PuT supply from Visum, undirected link stops were traversed multiple times at the beginning or end of line routes, where the line route initially leads in the wrong direction to the end of the link and turns there. This is now avoided by an improved routing at both ends of a line route. **(18934)**

Network Editor

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

PrT Assignment

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

Fixed Bugs

Add-Ins

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

COM-API

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

Data Model

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

Dialogs

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

Formulas

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

Formulas, Network Editor

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

Graphics

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

I/O Interfaces

- Different operators in GTFS import: Up to now vehicle journeys with the same 'route_short_name' were combined to one line, even if they had different operators. This bug has been fixed. **(19098)**
- Import of PuT supply from Visum accelerated: The import of a PuT supply from Visum was unnecessarily slow and was accelerated in cases where many line route elements of the source network were not mapped but skipped to nodes or stop points in the target network. **(19093)**

- ✔ Link run times when importing an Emme network: When importing an Emme network, the link run times for each public transport system are now related to the specified link length and no longer to the direct distance length. Furthermore, the import no longer terminates if a stop was not found in the course of a line route. Only the line route item is then skipped. **(18495)**
- ✔ Unsorted shapes in GTFS: When importing a General Transit Feed (GTFS), the points of a shape for a line route were read in the order in which they are listed in the file, and not in a possibly different explicitly specified numbering. This error has been fixed. **(19149)**

Junction Editor

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

Line Blocking

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

Lists

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

Miscellaneous

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

Network Editor

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

PrT Assignment

- ✔ End time in assignment quality lists for ICA and SBA: In the PrT Assignment quality lists for assignment with ICA and for simulation-based dynamic assignment (SBA), the previous attribute 'End time', which contained the date and time, was divided into two separate attributes for the end day and the end time. **(19090)**
- ✔ Time offset of the signal programs in SBA: When using daily schedules for signal controls in the simulation-based assignment (SBA), the time offset of the first signal program was previously applied to all signal programs and even overwritten in the .sig file. This error has been fixed. **(19131)**
- ✔ User-defined ideal flow rate for node impedance according to ICU: The user-defined ideal flow rate was not taken into account when calculating node impedances for signalized nodes according to ICU for left turns. This error has been fixed. **(19202 🚫)**

Scenario Management

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

Schematic Line Diagram

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

Timetable Editor

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

❗ Breaking Changes

PrT Assignment

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

18.02-00 [135444]

2018-09-20

+ New Features and Changes

Scenario Management

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

ANM

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

Add-Ins

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

COM-API

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

Data Model

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

Dialogs

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

Formulas

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

Graphical Procedures

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

Lists

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

Other Procedures

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

PrT Assignment

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

Procedure Sequence

- ⊕ Default folder for temporary files: The default folder for temporary files, which are created during the distributed calculation of scenarios or procedure steps in the procedure sequence (e.g. before the files are transferred to the compute node), was moved from the user directory to the temporary directory of the system (%TMP%). This means that when temporary files are deleted using the standard Windows procedure, these files are also deleted. **(19041)**
- ⊕ Executing the entire procedure sequence on a compute node: Within the framework of distributed computing, it is now possible to execute the entire procedure sequence of a version file on a compute node, in particular also outside scenario management. **(13038)**

PuT Operating Indicators

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

Visum Files

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

✔ Fixed Bugs

ANM

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

COM-API

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

Data Model

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

Demand Procedures

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

Filters

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

Formulas

- ✔ Attribute IDs in formulas: Attribute IDs referenced in formulas were converted to uppercase, breaking string comparisons in relations with conditions. This error has been fixed. **(19069)**
- ✔ Sub-attributes of indirect attributes: Sub-attributes of indirect attributes were not handled correctly in relations with condition. This error has been fixed. **(19070)**
- ✔ TableLookup without suitable object: The function TableLookup returned the value of the expression specified as the third parameter even if there was no network object that satisfied the condition (formulated in the second argument) as long as the expression did not access attribute values of the network object that satisfied the conditions. This error has been fixed, i.e. if there is no network object that meets the condition, TableLookup now always returns an empty value. **(17879)**

Lists

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

Matrix Editor

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

Network Comparisons

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

Network Editor

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

Passenger Surveys

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

PrT Assignment

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

Scenario Management

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

Schematic Line Diagram

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

Signal time-space diagram

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

Subnetwork Generator

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

Timetable Editor

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

Visum Files

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

❗ Breaking Changes

Demand Procedures

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

Formulas

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

PrT Assignment

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

18.01-02 [134410]

2018-08-29

➕ New Features and Changes

COM-API

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

Dialogs

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

Graphics

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

Lists

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

PrT Assignment

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

Visum Files

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

✔ Fixed Bugs

COM-API

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

Data Model

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

Dialogs

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

Dialogs, Timetable Editor

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

Filters

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

Formulas

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

Lists

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

Schematic Line Diagram

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

Timetable Editor

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

Visum Files

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

❗ Breaking Changes

Visum Files

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

18.01-01 [133662]

2018-08-07

+ New Features and Changes

Graphics

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

I/O Interfaces

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

Installation

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

Network editor

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

Procedure Sequence

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

Visum files

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

✔ Fixed Bugs

COM-API

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

Data Model

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

Dialogs

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

Graphics

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

Lists, I/O Interfaces

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

Miscellaneous

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

Other Procedures

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

PrT Assignment

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

PuT Assignment

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

Visum files

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

❗ Breaking Changes

PrT Assignment

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

18.01-00 [133146]

2018-07-22

+ New Features and Changes

COM-API

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

Demand Procedures

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

I/O Interfaces

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

Installation

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

Junction Editor

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

Main Window

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

Network Editor

- + Changing background maps: Showing and hiding different background maps is now also possible directly via the toolbar of the network editor. **(18831)**
- + Internet map requests no longer block: In certain cases, unanswered requests to the server of an Internet map service could freeze Visum. This is now avoided by completely decoupling the requests, i.e. you do not see the Internet map as long as the server does not answer, but you can continue working in Visum. **(13620)**
- + Length and duration of inserted system routes: When manually inserting a system route, its duration and length are now set to the totaled run times or lengths of the links traversed (instead of to the value 0 as before). **(18736)**

Other Procedures

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

PrT Assignment

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

PuT Assignment

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

PuT Line Blocking

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

Scenario Management

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

Schematic Line Diagram

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

Subnetwork Generator

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

Visum Files

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

🟢 Fixed Bugs

Data Model

- 🟢 Consideration of switched off SC: If a signal control was switched off according to its properties, (main) nodes using this signal control were partly treated as signalized nodes anyway - especially in the ICA calculation. This error has been corrected. **(18854)**
- 🟢 Inserting a profile point in a coupled section: If a time profile point is inserted in the coupled section of two or more vehicle journeys and a standard dwell time greater than 0s is defined for the associated stop point, either the arrival or departure times of the coupled vehicle journeys in the coupled section could become inconsistent depending on the constellation or the activation of the profile point could fail with an error message. This error has been corrected. **(18880)**
- 🟢 Line network length at main lines: The attribute 'Line network length (directed/undirected)' showed the sum of the corresponding attributes of the lines of the main line instead of the total length of all links of the main line, so that links used by different lines entered the attribute several times. This error has been corrected. **(18827)**
- 🟢 Line network length at transport system and operator: At the network objects transport system and operator, the attribute 'Line network length (directed/undirected)' displayed the sum of the corresponding attributes of the lines with a suitable transport system or operator instead of the total length of all links travelled by these lines, so that links travelled by different lines entered the total several times. This error has been corrected. **(18861)**

Demand Procedures

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

Dialogs

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

Formulas

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

Graphics

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

I/O Interfaces

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

Installation

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

Main Window

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

Network Comparisons

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

Network Comparisons, Scenario Management

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

Network Editor

- ✔ 'Clicking through' the legend: Mouse gestures executed above the legend (clicks, double-clicks, dragging) could affect network objects below the legend. This bug has been fixed. **(18760)**
- ✔ Edit course of several line routes slow: Changing the course of several line routes at the same time was unnecessarily slow in case of a lot of line routes and has been accelerated. **(18791)**

Other Procedures

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

PrT Assignment

- ✔ Calculation error in fast variant of the blocking back model: The blocking back model provided incorrect results if the option 'Exploit capacities evenly (faster)' was active and only turn capacities, but no link capacities were taken into account. This error has been fixed. **(18183)**

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

PuT Assignment

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

PuT Operational Indicators

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

PuT Passenger Survey

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

Scenario Management

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

Transfers Display of Regular Services

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

Visum Files

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

❗ Breaking Changes

Data Model

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

Other Procedures

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

PrT Assignment

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

PuT Operational Indicators

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

18.00-00 [132360]

2018-06-27

[+](#) New Features and Changes

ANM

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

Add-Ins

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

COM-API

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

Data Model

- + Aggregation functions 'First' and 'Last': Relations using the aggregation functions 'First' or 'Last' can be edited like other 1:1 relations for editable attributes. **(18556)**
- + Attribute 'Volume' of connectors: The attribute 'Volume' with the subattributes `AHPI`, `PrTTSys` and `PuTWalk-TSys` has been removed. **(18010 🚫)**
- + Attributes of data type 'precise duration': The data type of several attributes has been changed to 'precise duration' to also display the unit of values. **(18069)**
- + Copying attributes: In the list of all attributes (ID 9712) it is possible to copy attributes using the entry 'Insert copy' from the context menu. Regular attributes can be inserted as user-defined attributes and user-defined attributes can be copied across network objects. **(14272)**
- + Maximum wait time for connecting journeys: The maximum wait time can be defined differently for reached and missed connections. **(18003)**
- + Network object planned connections: The new network object planned connection can be added between two vehicle journeys. A planned connection can have values for the guaranteed wait time and the probability how likely the connecting train will be reached. **(18604)**
- + New aggregation function: At 1:n relations the new aggregation function 'ExactlyOne' is available. **(18577)**
- + New attribute 'Post length direct': Line route items have a new calculated attribute that outputs the direct distance between the stop point of the current line route item and the stop point of the following line route item. **(17914)**
- + New relations from zone and main zone: New relations from the network objects zone and main zone, respectively, have been introduced to access the corresponding origin and destination (main) OD pairs. The standard aggregation functions of indirect attributes are available. **(5613)**
- + New relations: The relations from the line block version and line blocks to 'Network' have been added. **(18600)**
- + Relations with condition: For 1:n relations (one object to several objects) an additional condition can be set for aggregation functions. In these cases, the relation gives only objects for which the condition is fulfilled and the aggregation function is applied to those objects. Example: `'[SUM:INTURNS([TYPENO] = 2)\VOLVEHPRT(AP)'` can be defined as formula for a link attribute. **(18387)**
- + Restriction of link type numbers: The restriction to 100 link types has been lifted. It is now possible to create and delete link types in the corresponding list. **(9998)**
- + Setting for PuT connections: Connections between services of the same line can be excluded by an option under network parameters. By default, the check box is ticked. **(18063 🚫)**
- + User defined Attributes: For further non-persistent network objects formula-based user defined attributes can be created. Additional non-persistent network objects are for instance `Transfers`, `PuT Relation`, `PrT Assignment Quality` or `stop sequence items`. Because these objects not always exists, only the formula definition of the user defined attribute is stored. **(18152)**
- + VDF-Number: The ID of the VDF-Number has been unified to 'NO'. This change affects the XML file of the procedure parameter file. **(18567)**
- + Wait and transfer time: In addition to the attribute 'Time', the list `PuT transfer objects` also contains its components 'Waiting time' and 'Transfer time' separately. **(18096)**

Demand Procedures

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

Dialogs

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

Filters

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

Formulas

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

Graphical Procedures

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

Graphics

- + Draw Objects: The drawing and selection of objects can be controlled on the basis of content-related criteria. Thus, it is easy, for example, to display only the ten objects with the highest values in a selected attribute without using filters. **(17639)**
- + Graphic parameters of time-space diagram: The graphic parameters of the time-space diagram can be saved per view and also saved for several views of this type in the global layout. **(17886)**
- + High DPI support for text sizes in graphical output: If the operating system is set to a text size greater than 100%, corresponding scaled icons with higher resolution are displayed in the menu. **(18081)**
- + Line bars: Link bars of the type line bars have been extended by the aggregation level of line route items. This allows the classification according to attributes of the line route items. **(17648)**
- + Object selection: The graphic parameters offer the possibility of contextual selecting the objects to be drawn. The user selects the attribute that determines the drawing order and limits the number of objects to be drawn. **(17651)**

I/O Interfaces

- + Attribute selection in railML-Import: The attribute lists for vehicle journey and line blocks in the railML-import dialog can now be restricted to attributes which are actually present in the source file. **(17921)**
- + Automatic creation of POI categories in Shapefile import: POI categories can now be created automatically based on the contents of the source field selected for the category number. This also allows POIs to be imported in non-additive mode. **(8910)**
- + Digits in field names of Shapefiles: Shapefiles containing field names starting with can now be imported. The names of the generated user-defined attributes get the prefix 'UDA'. **(10330)**

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

Installation

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

Lists

- + Access to path lists: The access to path lists has been revised. Via the menu Lists > PrT paths and PrT path on link level, respectively, lists of paths from the assignment are opened. The menu entries Path set, Paths and Path items open lists of user-defined paths. **(18701)**
- + Attributes: A new list including all available attributes has been added which replaces the external file 'attribute.xlsx'. Optionally, only user-defined attributes can be shown, edited, created or deleted in this list. **(9712)**
- + Block item types: The dialog for PuT block item types has been replaced by a list. **(18351)**
- + Display of results for several demand segments: In the list PuT transfer objects, the results can be displayed for several demand segments that have been assigned together. **(17662)**
- + PuT Path Lists: The calculation of PuT Path Lists has been accelerated. **(18664)**
- + PuT shortest path search: The list of the PuT shortest path search can be synchronized with other views. **(18013)**
- + Sort: When sorting lists with many items, e.g. path lists, a progress bar and an option to cancel the process appear. **(12646)**
- + Sorting in path lists: Sorting is available in various path lists. **(16477)**
- + Variables: There are two lists for variables, one for the definitions and one for the values. In the list of definitions it can be determined which parameter of which procedure the variables represents. In the second list a value can be defined that is applied when the procedure is executed. **(18320)**

Main Window

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

Matrix Estimation

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

Miscellaneous

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

Network Editor

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

Other Procedures

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

PrT Assignment

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

Procedure Sequence

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

PuT Assignment

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

PuT Line Blocking

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

PuT Operating Indicators

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

Scenario Management

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

Timetable Editor

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

Visum Files

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

! Breaking Changes

Data Model

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

Dialogs

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

PrT Assignment

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

COM-API

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


Data Model

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

PrT Assignment

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

COM-API

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