PTV Visum 2023 Release Notes

PTV | GROUP

Last modified: 2023-02-21

2023.01-05   [255739]

2023-02-21

⊕ New Features and Changes

Data Model

⊕ Conversion of RBC controls to Vissig controls: RBC type signal controllers can be converted to Vissig type (fixed-time) controls. When converting actuated controls, information is inevitably lost in the process. **(23956)**

I/O Interfaces

⊕ No more Access driver installation: We no longer install drivers for MS Access for security reasons. In return, Visum is now able to use all found Access drivers in 32bit or 64bit. This means that importing or exporting Access databases will only work if there is either an Access installation on the computer or a suitable driver has been installed manually or from other software. Suitable drivers can be obtained free of charge from Microsoft if required ("MS Access Database Engine"). Since the Access driver was installed in previous versions of PTV Visum, it is also sufficient to have an older Visum version installed. **(24544)**

Installation

⊕ Update CodeMeter Runtime: The CodeMeter Runtime deployed with PTV Visum has been updated to CodeMeter 7.60. **(25064)**

Main Window

⊕ MRU entries for cloud models: Open models as well as models newly saved in PTV Vision Cloud now appear in the list of recently used networks ('MRU list') both in the main menu and on the start page. **(21209)**

Network Editor

⊕ Fare points when creating the opposite direction of a line route: When creating the opposite direction of a line route, the attributes of the line route and time profile items that refer to the path from this item to the following item are now transferred to the neighboring item, so that they still refer to the same item-item section (just in the other direction). This concerns in particular the specification of fare points. **(23670)**

Other Procedures

⊕ Network-wide signal optimization based on time range: Network-wide signal optimization (offset time, split and cycle time) can now also be carried out based on a specific time period. The condition is that a dynamic assignment result is available, which was calculated with the simulation-based dynamic assignment (SBA) or the pseudo-dynamic procedure (PDV). **(24073)**

✓ Fixed Bugs

Add-Ins

✓ Crash in 'Generate PuT Zone Connectors': Crashes no longer occur when running the 'Generate PuT Zone Connectors' add-in if there are zones with multi-part polygons in the network. **(24991)**

Data Model

✓ Consistent change of modes of an EVA assessment type: Changing the set of modes of an EVA assessment type by importing the demand file or via COM previously resulted in an inconsistent state of the procedure parameters, which could lead to a crash during subsequent operations. This error has been fixed. Changes made via the procedure parameters dialog of the procedure 'EVA weighting' were not affected. **(24488)**

✓ Incorrect warning when removing a route point: When removing a route point where no vehicle journeys start or end, an incorrect warning was issued that this action would delete vehicle journeys. This bug has been fixed. **(25068)**

Demand Procedures

- ✅ Numerical instability in tour-based model: Numerical instability could occur in tour-based model combined mode choice and distribution, especially when rubberbanding was used, such that very small changes to the input data resulted in extreme differences in the results. In particular, the sums of the matrices per activity transition of a chain no longer matched. This error has been fixed. **(25007 ⚠️)**

Dialogs

- ✅ Input demand matrix in incremental mode of Nested Demand: In the incremental mode of the demand procedure 'Nested Demand', the input demand matrix on the highest level of the decision tree is not used. However, it was still displayed in the dialog. This bug has been fixed. **(25071)**

Graphics

- ✅ Incorrect graphic display of marked line routes: Marked line routes were partially displayed with the graphic parameters of marked links instead of the global "Marking 1" color. This error has been fixed. **(25019)**

I/O Interfaces

- ✅ Existing tables option did not work on database import: When importing from a database, the tables present in the database were no longer displayed. This error has been fixed. **(25018)**
- ✅ MapFan DB import crash: A crash no longer occurs when importing 'MapFan DB' network data. **(25031)**
- ✅ No OSM import with user-defined configuration: The import of OpenStreetMap data could not be carried out based on a user-defined configuration in the Windows user application data directory (...\AppData\Roaming\PTV Vision\PTV Visum 2023\Importer\OSM). This error has been fixed. **(25063)**
- ✅ Ring shapes during GTFS import: When importing a ring shape, the first or last stop-stop-section of the shape could be missing during GTFS import, resulting in incorrect routing of the line route. This bug has been fixed. **(25032)**
- ✅ Special characters in aliases during Publisher export: When exporting to PTV Visum Publisher, special characters in aliases for attributes of the exported tables led to errors during export. This error has been fixed. **(24960)**

Junction Editor

- ✅ Node loses focus in case of changes: When making certain changes to attribute values, the node or main node displayed in the junction editor lost focus, i.e. no node/main node was subsequently displayed. This bug has been fixed. **(23563)**

Network Editor

- ✅ Splitting links at polylines: Splitting links at surface boundaries did not work if the used surfaces were polylines (which is only possible for POI surfaces). This bug has been fixed. **(24196)**
- ✅ Too few transport systems after simplifying node-link network: After executing the network editor special function 'Simplify node-link-network', some merged links were not open for all transport systems for which those of the replaced links were open. This bug has been fixed. **(25012)**

PrT Assignment

- ✅ Wrong wait time at the leg for unsignalized turns: The wait time of a leg was calculated incorrectly if there was an unsignalized turn with a wait time of 0. This error has been fixed. **(25022 ⚠️)**

PuT Assignment

- ✅ Acceleration in case of numerous PuT-Aux transport systems: If a network contained several PuT-Aux transport systems, too many nodes were previously considered as relevant transfer points. This had a particularly negative effect on the waiting time when opening a version file with PuT assignment results. This error has been fixed. **(25009)**
- ✅ Skims per AI from headway-based assignment: If the calculation of skim matrices was additionally requested for each analysis time interval during the headway-based assignment, the resulting matrices only contained the value set for the case 'No path found'. This error has been fixed. **(25069)**
- ✅ Tour planning more error-tolerant: If a tour plan is generated in the tour planning procedure with events in a swapped order, it is now read in with a corresponding warning. The procedure is then considered successfully executed. **(25094)**

Visum Files

- ✅ Broken path files: Visum saved corrupt path files when using environment variables (e.g. '%APPDATA%'), which could then no longer be imported correctly. This error has been corrected. **(24951)**
- ✅ Operating periods missing for predefined cases: For the predefined case 'Timetable' in the context of saving a network file, the network object type 'operating periods' was not selected. This error has been fixed. **(24810)**

⊘ Breaking Changes

Demand Procedures

⊘ Numerical instability in tour-based model: Numerical instability could occur in tour-based model combined mode choice and distribution, especially when rubberbanding was used, such that very small changes to the input data resulted in extreme differences in the results. In particular, the sums of the matrices per activity transition of a chain no longer matched. This error has been fixed. Changing the sequence of arithmetic operations can cause the arithmetic results to change within the accuracy of floating-point number arithmetic. In networks where the numerical instability occurred, this deviation is massive. **(25007 ⊘)**

PrT Assignment

⊘ Wrong wait time at the leg for unsignalized turns: The wait time of a leg was calculated incorrectly if there was an unsignalized turn with a wait time of 0. This error has been fixed. This changes the results of the assignment with ICA in affected networks. **(25022 ⊘)**

2023.01-04 [254547]

⊕ New Features and Changes

Junction Editor

⊕ Vissim node preview updated: The Vissim node preview has been updated to version PTV Vissim 2023.0-3. **(24833)**

Line Blocking

⊕ Warning for e-mobility with open line blocks: If open line blocks are formed and recurring user-defined (charging) activities are scheduled in the process, a warning now indicates the serious methodological deficiencies of this combination. **(24658)**

⊘ Fixed Bugs

ANM

⊘ Incorrect link polygons during ANM export of roundabout main nodes: During ANM export, incorrect link polygons could occur for main nodes modeled as roundabouts. This error has been corrected. **(24839)**

Add-Ins

⊘ 'Demand Calibration' adds output matrices: If the add-in 'Demand Calibration' was canceled, additional output matrices remained in the associated tour-based model procedure and were created again when executed later. This bug has been fixed. **(24569)**

Data Model

⊘ WktWGS84 attributes generally available: The attributes "WKT...WGS84" existing at all geometric network objects for the output of the geometry as WKT string in the projection WGS84 were made generally available. **(24887)**

Demand Procedures

⊘ Nested demand slower: The procedure 'Nested demand' had become slower compared to previous program versions if values occurred on many relations, which resulted in subnormal values when applying the exponential function. This bug has been fixed. **(24918)**

Dialogs

⊘ Attribute selection very slow in version comparison: If there was a version comparison with transferred attributes from the comparison network and there were many time intervals in these networks, the interaction in the attribute selection dialog was extremely slow. This bug has been fixed. **(24949)**

⊘ Attributes for version comparison missing in attribute selection: In the attribute selection dialogs, the entries for the attributes of a version comparison with a network loaded in the background were missing in the systematic and alphabetical sorting. They were only displayed in the hierarchical sorting. This bug has been fixed. **(24727)**

- ✅ Display of network minimum and maximum incorrectly formatted: In the Edit dialog of a single line or path bar as well as in the table of all bars, the min and max values were formatted incorrectly. This error has been fixed. **(24987)**
- ✅ Selection of projections for project directory without backslash: If the path for the project directory for projections did not end with a backslash, no entries were displayed in the projection selection dialog. This bug has been fixed. **(24903)**

Graphical Procedures

- ✅ Error in flow bundle calculation when continuing between path legs: If a PuT path originated from a survey data set in which two consecutive path legs were completed with the same vehicle journey, flow bundle evaluations based on it were cancelled with an error. This error has been fixed. **(24911)**

Graphics

- ✅ Placeholders for graphics in the legend: Placeholders for graphics used in the header or footer of a legend were displayed differently after closing and reopening the legend parameter dialog, and were actually changed when the dialog was subsequently closed. This bug has been fixed. **(24798)**

I/O Interfaces

- ✅ Inconsistent length information after GTFS import: After a GTFS import, the length information of links and line route items partly matched the airline length and partly matched the polygon length. This error has been corrected, i.e. all lengths of links and line route items now match the polygon length. This does not affect imported length specifications ('shape_dist_traveled') that are stored in a user-defined attribute. **(24773)**
- ✅ Loops in walk links when updating PuT: If two stop areas separated in the source network were mapped to the same stop area in the target network when importing PuT supply from Visum, a possibly existing walk link between them could not be transferred to the target network as a link. This error has been corrected in that the transition is now saved to the transition matrix of the stop. **(24801)**
- ✅ Unconnected shapes in GTFS import: The geographical courses could not be taken into account during GTFS import if the points of each course were not listed in direct succession in the 'Shapes.txt' file. This bug has been fixed. **(24936)**

Installation

- ✅ User-defined background maps: User-defined services for background maps are stored in the registry. However, these were no longer read when the program was restarted. This error has been corrected. **(24953)**

Junction Editor

- ✅ Lanes could not be selected: Under certain circumstances, some lanes could not be marked in the junction editor. This bug has been fixed. **(24672)**

Line Route Editor

- ✅ Copy and paste did not work with fixed times: Pasting previously copied line route items into the line route editor failed if the target line route had a fixed arrival or departure time (except for the first departure time). This bug has been fixed. **(24831)**

Main Window

- ✅ Synchronization of messages from check for multiple straight turns: Messages indicating multiple straight turns and main turns in the corresponding 'Check network' function could not be synchronized, i.e. when clicking on the message, the affected (main) turns were not marked. This error has been fixed. **(24643)**

Matrix Estimation

- ✅ Floating-point numbers as weights for distributions: In case of skim data distribution, in the parameters dialog of the 'Demand matrix correction' procedure in the 'Least squares' variant, it was previously only possible to enter a whole number as weight, although values smaller than 1 would be more useful. In the variant 'TFlowFuzzy', only integer percentages were allowed. This error has been fixed. **(24676)**

Miscellaneous

- ✅ Log of the startup phase: All entries from the phase immediately after the program start were missing in the log file. This error has been fixed. **(24735)**

Network Comparisons

- No default selection for version comparison with transferred attributes: No attributes are preset anymore when creating a version comparison with attributes taken from the comparison network. This error has been fixed. **(24812)**

Network Editor

- Fixed line route items not detectable when rerouting: When editing the course of one or more line routes, if you fixed a line route item, it was not immediately drawn in the second marker color, but only after the mouse was moved to a different position. This error has been fixed. **(23413)**
- Selectable volume for updating impedances: The selectable volume for signal time optimization did not work for ICA calculation when it was called as part of the multi-edit special function 'Update impedances at nodes'. This bug has been fixed. **(24937)**

Other Procedures

- Crash of local signal optimization in the Junction editor: A crash no longer occurs when executing the signal time and split optimization of a signal controller based on volumes calculated with the simulation-based dynamic assignment (SBA) if the calculation is executed outside of the procedure sequence, e.g. from the Junction editor. **(24902)**
- Message during headway offset optimization: When executing the procedure 'Headway offset optimization' in the procedure sequence, a warning interrupting the procedure occurred even if the display of warnings should be suppressed during procedure execution. This error has been fixed. **(24917)**

PrT Assignment

- Crash of equilibrium assignment with ICA nodes: A crash no longer occurs when running an equilibrium assignment if the ICA calculation shall be executed during assignment and ICA nodes in the still unloaded network have impedance 0. **(24941)**
- Unnecessary consistency check for base volume: Even if no hybrid but a standard simulation-based assignment was set, a check was made whether the settings for the base volume in the macroscopically considered area from the general procedure settings matched the settings for the base volume in the simulated area in the procedure parameters of the SBA assignment. This error has been corrected. **(24963)**

PuT Line Blocking

- Potential infinite loop: In line blocking with vehicle interchange, an infinite loop could occur under certain circumstances. This error has been fixed. **(24981)**

PuT Operating Indicators

- Projected indicators for AH with passenger trip chains incorrect: If there are passenger trip chains, indicators that incorporate the times of the passenger trip chains were partially projected with incorrect projection factors for the territory and territory PuT detail. This affects all times as well as the indicator cost-time for territory and territory PuT detail. This error has been fixed. **(24930)**

Scenario Management

- Crash when selecting attributes for modifications: A crash no longer occurs when opening the attribute selection on the Modifications tab of the Scenario management floating dialog. **(24822)**

Schematic Line Diagram

- Selecting texts after loading a layout: After loading a layout for a schematic line diagram containing texts, these texts could not be selected and edited. This was only possible again after some other change to the line diagram. This error has been fixed. **(24802)**

Visum Files

- Global layout files: Opening a global layout file via COM in the procedure sequence could lead to a crash of PTV Visum. This error has been corrected. **(24884)**

2023.01-03 [252885]

⊕ New Features and Changes

Data Model

⊕ More patterns for RBC controls: Up to 120 patterns (instead of 8) are now available for RBC controls. **(24525)**

Demand Procedures

⊕ Memory problem with SynPop import: If too many user-defined attributes were provided at objects of the synthetic population, a memory shortage could occur during SynPop import in the ABM example. The script code of our example has now been improved so that many user-defined attributes no longer cause problems. **(24800)**

Installation

⊕ License size for stop areas adjusted: The factor for the allowed number of stop areas per licensed zone has been increased, i.e. with the same number of zones in the license, networks with more stop areas can now be edited. **(24746)**

⊕ The Vissim previewer has been updated to version Vissim 2023.00-02. **(24741)**

Junction Editor

⊕ The Vissim previewer has been updated to version Vissim 2023.00-02. **(24741)**

Other Procedures

⊕ Also subnormal values in network check 'Invalid matrix values': The 'Check network' function 'Invalid matrix values' can now optionally search for and replace subnormal numbers, i.e. floating-point numbers whose absolute value is so small that it no longer has a normalized display. Such extremely small numbers are always replaced by 0 during the repair. **(24149)**

PuT Line Blocking

⊕ Acceleration of the last stage: The last stage of the procedure 'Line blocking' (all variants) has been accelerated. This has a particular effect in networks where the arrival and departure times of the vehicle journey sections used are not rounded (e.g. to minutes or multiples of 10s). **(23872)**

✅ Fixed Bugs

COM-API

✅ Column filters did not work when applying list layouts via COM: When a list layout file was applied via COM, column filters contained in it did not work, unlike when the same file was applied interactively. This bug has been fixed. This also changes the output of calls of type Visum.IO.SaveAttributeFile when column filters are active in the specified list layout file. **(24541 🛑)**

✅ Crash on MainTurns.SetDefaultsFromGeometryAndTurnStandard without main turns: In networks without main turns, calling MainTurns.SetDefaultsFromGeometryAndTurnStandard caused a crash. This bug has been fixed. **(24816)**

✅ Export of PrT paths lists slow in case of many demand segments: When a lot of assigned PrT demand segments existed, exporting PrT paths lists (all variants) as an array was unnecessarily slow. The export has been accelerated. **(24704)**

Data Model

✅ Warnings for incorrect line route lengths: Due to errors in adjustment operations, line route items could have negative lengths or the last line route item of a line route could show a To-length different from 0. If a version file with such errors is opened, a warning now indicates this condition. Line route items at the end of a line route are automatically corrected. As a user, you should manually check the affected line routes for correct lengths. **(24825)**

Formulas

✅ No more crash when using TableLookup for temporary network object types: No more crashes when using the TableLookup function for network object types with a temporary character. Prominent examples of such types are: OD pair and main zone relations, PrT and PuT paths (all variations), walk and wait times within stops, path sequences, and various assignment objects. **(24804)**

Graphics

✅ WMS services could not be added: Since ID 24677, WMS map layers could not be added in the user settings. This bug has been fixed. **(24790)**

I/O Interfaces

- ✅ Crash on shapefile export if the file already existed: A crash no longer occurs when exporting shapefiles if a file with the same name already exists in the target directory. **(24817)**
- ✅ Emme import failed due to license size for stop areas: The Emme import failed if during the import the number of stop areas became larger than allowed by the license. This error has been fixed in that Visum now switches to oversize mode in this case, in which it is then still possible to select a suitable subnetwork. **(24700)**
- ✅ z-values incorrect: For z-values (height specifications), arbitrary values as well as incorrect bounding box specifications were output in certain cases. This error has been fixed. **(24733)**

Installation

- ✅ Wrong default language: For some operating system languages, German was selected as the default language instead of English. This error has been fixed. **(24674)**

Lists

- ✅ 'Only active' not saved: Some PuT detail lists did not save the option 'Only active' in their layout file or the global layout file. Affected were the lists for the objects territory PuT detail, stop point PuT detail, and territory PuT detail-vehicle journey item. This error has been fixed. **(24464)**
- ✅ Export of PrT paths lists slow in case of many demand segments: When a lot of assigned PrT demand segments existed, exporting PrT paths lists (all variants) as an array was unnecessarily slow. The export has been accelerated. **(24704)**

Main Window

- ✅ Long file names led to warnings: If files with very long names were opened in previous sessions, this led to warnings displayed in modal dialogs per affected file the next time the program was started. This bug has been fixed. **(24791)**

Miscellaneous

- ✅ Crash after loading a version file via command line: A crash no longer occurs when changing the network if the version file to be opened was previously indicated without the '-h' option when starting the Visum instance via the command line. **(24823)**
- ✅ Distributed computing failed occasionally: The execution of calculations on a compute core failed from time to time due to file access conflicts. This bug has been fixed. **(24732)**

Network Editor

- ✅ Inconsistent data model after line route modifications: Applying model transfer files or modifications to a scenario management project could lead to an inconsistent state of the data model of line routes if the user setting 'Adjust time profiles to route point changes' was selected. Re-routing in the network editor could then also corrupt the data model. As a result, data errors and also program crashes could occur. This error has been fixed. **(24834)**

PrT Assignment

- ✅ PDV cannot be executed twice: If the Pseudo Dynamic Volumes (PDV) procedure was executed once, it could not be recalculated for the same demand segment. This error has been fixed. **(24707)**
- ✅ Shortest path search did not correctly observe through traffic prohibitions: In certain very special constellations, the shortest path search could find paths that did not observe an existing through traffic prohibition ('No through traffic'). As a result, the equilibrium assignment could crash. This error has been fixed. **(24826)**

PuT Assignment

- ✅ Performance issue concerning rounded demand: The timetable-based assignment took longer than necessary if demand was rounded, especially in networks with many zones, but little supply, such that the path search for each origin zone was fast. This bug has been fixed. **(24851)**

PuT Line Blocking

- ✅ Acceleration for very large examples: Line blocking (all variants) has been accelerated for very large examples, especially for applications with open line blocks. Additionally, a note explains that in such cases rounding the arrival and departure times of all relevant vehicle journey sections reduces the runtime. **(24739)**
- ✅ Warning if vehicle costs are too low: If a vehicle cost rate was too low, a warning has been issued so far. However, the decisive factor is the product of the coefficient of the vehicle costs in the procedure parameters and the respective cost rate. Therefore, a warning is now issued if this product is too small. **(24650)**

Scenario Management

- Importing stage-based controls: Importing modified data of a stage-based control from model transfer files or modifications in a scenario management project did not succeed because the absence of overlap was checked after each modified stage, but this is temporarily necessary. This bug has been fixed. However, data from stage-based controls saved with Visum 2021 or earlier cannot be imported into Visum 2022 or newer if they are inconsistent with regard to intergreens, because such constellations are no longer allowed. **(24717)**
- Inconsistent data model after line route modifications: Applying model transfer files or modifications to a scenario management project could lead to an inconsistent state of the data model of line routes if the user setting 'Adjust time profiles to route point changes' was selected. Re-routing in the network editor could then also corrupt the data model. As a result, data errors and also program crashes could occur. This error has been fixed. **(24834)**

Subnetwork Generator

- Crash when loading procedure parameters for 'Estimate gravitation parameters (KALIBRI)': A crash no longer occurs when loading a procedure parameters file containing parameters of the 'Estimate gravitation parameters (KALIBRI)' procedure for a demand stratum that does not exist in the current network. In the subnetwork generator, this situation could occur if the 'Include the demand model in the subnetwork' option was disabled. **(24778)**

Visum Files

- Crash when loading procedure parameters for 'Estimate gravitation parameters (KALIBRI)': A crash no longer occurs when loading a procedure parameters file containing parameters of the 'Estimate gravitation parameters (KALIBRI)' procedure for a demand stratum that does not exist in the current network. In the subnetwork generator, this situation could occur if the 'Include the demand model in the subnetwork' option was disabled. **(24778)**
- Importing stage-based controls: Importing modified data of a stage-based control from model transfer files or modifications in a scenario management project did not succeed because the absence of overlap was checked after each modified stage, but this is temporarily necessary. This bug has been fixed. However, data from stage-based controls saved with Visum 2021 or earlier cannot be imported into Visum 2022 or newer if they are inconsistent with regard to intergreens, because such constellations are no longer allowed. **(24717)**

🛑 Breaking Changes

COM-API

- Column filters did not work when applying list layouts via COM: When a list layout file was applied via COM, column filters contained in it did not work, unlike when the same file was applied interactively. This bug has been fixed. This also changes the output of calls of type Visum.IO.SaveAttributeFile when column filters are active in the specified list layout file. **(24541** ✅**)**

2023.01-02 [251518]   2022-11-09

⊕ New Features and Changes

COM-API

- ⊕ Access to parameters of dynamic PrT skim matrix calculation: The new property PrTDynSkimMatrixParameters at IOperation provides access to the parameters of the procedure 'Calculate dynamic PrT skim matrix'. **(24121)**

I/O Interfaces

- ⊕ Extended import of UTDF data: The import of data in UTDF format (Synchro, Centracs) has been extended. Additional file types can now be imported and an additive import of UTDF files, e.g. with data on node geometry and signaling into an existing network, is also possible. **(24113)**

Installation

- ⊕ Component zlib updated: The zlib library, which was affected by a security vulnerability, has been updated. **(24709)**

Other Procedures

⊕ Selectable design hourly volume for split optimization of signal controllers: In the procedure 'Signal cycle and split optimization' as well as in the multi-editing special function for signalized nodes and main nodes, a (main) turn attribute can be selected as the source for the design hourly volume. In particular, this enables optimization for different time slices by selecting the volume in a time interval as the attribute. **(22181)**

Visum Files

⊕ Conflict avoidance for signal coordination groups: You can now also select conflict avoidance for signal coordination groups when reading network files additively. **(24656)**

✓ Fixed Bugs

ANM

✓ ANM export of static backgrounds did not work: During ANM export, static backgrounds (i.e. image files included as background) were not transferred. This error has been fixed. **(24731)**

Add-Ins

✓ VBA functions called with 'Run VBA' could not access Visum: The 'Run VBA' add-in could not call VBA functions that access data from Visum. This error has been fixed. **(24740)**

COM-API

✓ ILinks.SplitAtPolygonPoints did not consider 'only active': The ILinks.SplitAtPolygonPoints method did not consider the 'onlyActive' parameter. Only active links were always split, even if the parameter was set to 'false'. This bug has been fixed. **(24552)**

Data Model

✓ Crash on Undo after deleting line blocks: A crash no longer occurs when using 'Undo' after deleting line blocks or block versions containing line blocks. **(24532)**

✓ Infinite loop when removing link intermediate points at roundabouts modeled as main nodes: An infinite loop no longer occurs when removing link intermediate points at roundabouts modeled as main nodes. **(24719)**

Demand Procedures

✓ More messages in the economic traffic model: In the procedure 'Tour-based freight trip generation', there was no warning so far when negative savings occurred. Such are set to zero, which leads to unexpected results. This warning has been added. Likewise, a warning is now issued when negative return trips occur and are set to zero, causing the sums of the start and return trip matrices to differ. **(24651)**

Dialogs

✓ Axis labels in assignment analysis diagram incorrect: The axis labels in the assignment analysis diagram were incorrect. This error has been corrected. **(24419)**

✓ Departure time of PuT shortest path search adjusted: In the 'Graphic tools (Shortest path search)' tool window, on the dialog page for the interactive PuT shortest path search, when the start or destination stop area was selected, the start time was reset to the time that was set when the dialog was opened. However, this did not update the display, so the dialog may have shown a different start time than the one actually used for the search. This error has been fixed. **(24698)**

Formulas

✓ TableLookup and user-defined tables with umlauts: The TableLookup function did not work in user-defined tables whose name contained an umlaut (or other characters that do not belong to the Latin1 font). This bug has been fixed. **(24653)**

Graphics

✓ WMS services with server-specific attributes in the URL not usable: WMS services with server-specific attributes in their URL could not be included as a background map via the dialog. This error has been corrected. **(24677)**

I/O Interfaces

- ✅ Handling of one-way streets when importing bicycles: When using the 'Detailed urban bicycle network' configuration, one-way streets are now opened in the opposite direction for cyclists if the 'osm_oneway_bicycle' attribute has the value 'no' or if the 'cycleway=opposite' tag is set. **(24461)**
- ✅ Incorrect allocation to line blocks during railML import: Under certain circumstances, the individual actions were allocated to the wrong line block days during railML import. This error has been fixed. **(24616)**
- ✅ Incorrect walk and wait times of PuT paths during Publisher export: When exporting trips and activity executions from an ABM demand model, the resulting PuT paths did not take into account any walk times that may have occurred between stop areas at the boarding and alighting locations. I/O Interfaces: Incorrect walk and wait times of PuT paths during Publisher export: When exporting trips and activity executions from an ABM demand model, the resulting PuT paths did not take into account any walk times that may have occurred between stop areas at the boarding and alighting locations. In addition, a constant wait time existed at the boarding location, and when the export was executed, any flow bundle definition that may have existed in the network was deleted. These errors have been fixed. **(24702)**
- ✅ Pedestrians on one-way streets during OSM import: One-way streets were previously also closed for pedestrians in the opposite direction during OpenStreetMap import. This bug has been fixed, i.e. normally links are open for pedestrians in both directions if not explicitly indicated otherwise. **(24462)**
- ✅ Publisher export could not be read in case of minimum and maximum values: Export to Visum Publisher failed when the data contained certain special values that were displayed in lists as 'MIN' or 'MAX'. This error has been fixed. **(24711)**
- ✅ Speed of SBA vehicle trajectories when entering export section: When exporting trajectories of SBA vehicles to PTV Visum Publisher, vehicles had an incorrect speed when entering the exported (spatial and temporal) section. This error has been fixed. **(24691)**
- ✅ Speed v0 from OSM: Previously, a speed specified in the OpenStreetMap data was simply saved in a user-defined attribute of the link, and the speed v0 effective in the assignment resulted from the speed of the link type. This error has been corrected, i.e. v0 is now determined from the specified value, and if this is not available, the value of the 'Highway' type indicated in the OSM data takes effect. **(24460)**
- ✅ Transfer walk times and import of PuT supply from Visum: If a special transfer walk time at a stop (transfer walk times between transport systems, between lines and directions, or between time profiles) that already existed in the target network was created when importing a PuT supply from Visum, it was not transferred without a warning (Visum 22) or a crash occurred (Visum 23). This error has been fixed. **(24708)**

Junction Editor

- ✅ Infinite loop when removing link intermediate points at roundabouts modeled as main nodes: An infinite loop no longer occurs when removing link intermediate points at roundabouts modeled as main nodes. **(24719)**
- ✅ Shift of the view when switching to adjacent nodes: When switching to an adjacent node using the blue buttons in the 'Nodes' view of the Junction editor, the image section of the geometry view was not shifted so that the selected node was in the center of the view. This bug has been fixed. **(24415)**
- ✅ Unfavorable display of detectors: When detectors were arranged in an unfortunate way, in the geometry view of the Junction editor, they were drawn in such a way that the allocation to the lane was not easily recognizable. This error has been fixed. **(24526)**

Line Blocking

- ✅ Negative consumption is tolerated: In line blocking with recurring user-defined activities (e-mobility), a consumption function on any activity with a negative consumption (i.e. a positive value) did not always lead to an error until now, although the actual calculation was then no longer useful. This error was corrected, i.e. a charging function with a negative consumption leads to a termination of the procedure. If charging is actually to be performed on an activity that is not charging itself, this must be indicated by the charging function instead of implicitly via a negative consumption. **(24661)**
- ✅ e-mobility problematic with open line blocks: Line blocking with recurring actions (e-mobility) did not generate good solutions when open line blocks were used. This bug has been fixed. The combination of e-mobility and open line blocks nevertheless remains methodologically problematic, because in this case, it is not possible to check whether the vehicle can be charged sufficiently to provide the intended services by the time it is used the next day. We therefore recommend using only closed line blocks for e-mobility. **(24663)**

Main Window

- ✅ Expandable controls showed empty lists when invisible: If a toolbar becomes too narrow, the controls it contains become invisible, but can be brought back into view by clicking the 'Continue' button. Controls with expandable lists showed empty lists in this case, i.e. did not offer any options. This bug has been fixed. **(23352)**

Network Editor

- ☑ Creating surfaces failed without snapping vertices: If the option 'Automatic snapping of vertices' was not selected in the user preferences under 'Editing of polygonal objects', no new surfaces could be created. This bug has been fixed. **(24678)**
- ☑ Markings of sections of time profiles were merged: If several separate sections of time profiles were implicitly marked, the intermediate section of the time profile was also displayed as marked in the network editor. This could happen, for example, when marking several spatially separated coupling groups or when marking an edge in the schematic line diagram where an intermediate stop that was not displayed represented the circle line transition of the time profile. This error has been fixed. **(23610)**

Schematic Line Diagram

- ☑ Infinite loop in graphic parameters dialog: When opening the subdialog for setting labels at edges of the schematic line diagram, an infinite loop occurred. This error has been fixed. **(24729)**

Transfers Display of Regular Services

- ☑ Function for bar scaling no longer directly accessible: The function for unifying the bar scaling was no longer accessible via the symbol in the toolbar of the transfers display of regular services. This error has been fixed. **(24670)**

Visum Files

- ☑ Crash when opening version file with strongly shifted time series: If a time series existed in a network created with Visum 22 or earlier, whose start was shifted to a day outside the first year by specifying the start day in the demand description, Visum 2023 crashed when opening a version file saved with it. This error has been fixed. **(24685)**
- ☑ Possible infinite loop when saving an attribute file: When saving an attribute file, an infinite loop could occur if among the exported attributes the relation of a node was used to the locations whose nearest node was that node. **(24621)**

2023.01-01 [250553]   2022-10-12

⊕ New Features and Changes

Demand Procedures

- ⊕ Generate path sequences from ActivitySim tours: The procedure 'Generate path sequences from tours' previously rejected tours as input where only the activity locations matched, but not the activities themselves on successive trips. The procedure has been extended so that it can now also process tours that only fulfill the weaker condition. In particular, tours created with ActivitySim can now be processed. **(24536)**
- ⊕ Mode choice accelerated in ABM example: The mode choice in the ABM example code has been accelerated, which is particularly effective in large networks. **(22616)**

I/O Interfaces

- ⊕ Calculate slope after OSM import: As the import of OpenStreetMap data uses existing elevation data since ID 23726 (where applicable), the input attribute 'Slope' at links is now also calculated correctly from this during the import. **(24199)**

PrT Assignment

- ⊕ Extended route import faster: The procedure 'Extended route import' has been accelerated. **(24258)**

PuT Line Blocking

- ⊕ Consideration of operating times for e-mobility: In line blocking with recurring user-defined activities ('e-mobility'), desired durations of the vehicles' operations, defined as the time span between leaving the depot and the next entry into the depot, can now be specified and the deviation from this can be weighted against other properties in the objective function. **(20658)**

⊘ Fixed Bugs

Data Model

- ☑ Maximum slope/gradient did not consider network scale: The attributes 'Maximum positive slope' and 'Maximum negative slope' did not consider the network scale. The values were therefore incorrect if no projection was used and the network scale was not 1. This error has been fixed. **(24551)**

Graphics

- ✅ Displaying non-conform WMS services: Some Web Map Services (WMS) which do not completely conform to the WMS standard of version 1.3.0 are handled more gracefully, enabling them to be used in PTV Visum. **(24607)**

I/O Interfaces

- ✅ Blanks during synchro import: During synchro import, cells of data tables whose numerical content consists only of blanks are no longer interpreted as 0, but as empty. For cells containing strings (e.g. names), leading or following blanks are removed. This may change node names in the imported networks. **(24395)**
- ✅ Export of SIG file did not work with special characters: Using UTF8 special characters in strings (e.g. controller name) resulted in a corrupted *.sig file during export. This error has been fixed. **(24633)**

Installation

- ✅ Visum did not start on Windows server 2019 and Windows 8.1: PTV Visum did not start on the Windows server 2019 and Windows 8.1 operating systems. Already during the installation, an error message could occur. This error has been fixed. **(24570)**

Junction Editor

- ✅ Missing pedestrian detectors for RBC signal controllers: When opening the RBC dialog, detectors should be created in the Visum sense for detectors existing in the RBC data model. However, no detectors assigned to the respective crosswalks were created for pedestrian detectors. This error has been fixed. **(24565)**

Network Editor

- ✅ Inserting of faces incorrect: If several new faces were inserted into an existing surface one after the other when editing a polygon, the end result could be incorrect. This error has been corrected. **(24284)**

PrT Assignment

- ✅ Vehicles incorrectly positioned in SBA visualization at very low speeds: Vehicles on links whose speed v0 was less than 1m/s (=3.6km/h) in the unloaded network were incorrectly positioned in the visualization of the results of simulation-based dynamic assignment (SBA). This error has been fixed. **(24605)**

Procedure Sequence

- ✅ Missing check for merge procedure: When starting a procedure sequence, Visum did not check whether there was also an (also active) 'Merge procedure results' procedure step for each active procedure step executed on a compute node. This error has been fixed. **(24604)**

Subnetwork Generator

- ✅ Crash when cutting a subnetwork: A crash no longer occurs in cases where cutting a PrT path includes only two connectors and the node connecting them enters the subnetwork only indirectly. **(24493)**

Timetable Editor

- ✅ Formatting error in line block editor: A formatting error occurred in the line block editor when displaying the header data of a line block at which the consideration of the orientation was not enabled. This error has been fixed. **(24582)**

Visum Files

- ✅ Keyboard shortcuts are not read from script menu file: If the settings for the script menu were saved as a file and later reloaded (e.g. in another Visum instance), the provided keyboard shortcuts were not restored. This error has been fixed. **(24631)**

2023.01-00　[249702]   2022-09-21

⊕ New Features and Changes

ANM

⊕ New RBC data format: The ANM export for networks with controllers of type RBC makes use of the new RBC data format, i.e. exports files with the extension .prbc. These can be imported using the ANM import in PTV Vissim 2023. **(23094)**

⊕ RBC and detectors: When opening and closing the RBC dialog, the previously automatic generation of queue detectors is omitted. Usually, these were unused detector objects. **(24478)**

COM-API

⊕ Discontinued COM methods removed: Various COM methods that have been discontinued for some time have been removed. In detail, these are the following methods and properties: IVisum.GetWorkingFolder, IVisum.CreateAddNetReadController, IVisum.CreateNetReadRouteSearch, IVisum.CreateNetReadRouteSearchTSys, IVisum.IsJunctionEditorRunning, IVisum.CreateJunctionEditor, IVisum. GenerateModelTransferFileUsingLayout, IVisum.GenerateModelTransferFileBetweenVersionFilesUsingLayout, IVisum.CreateVersionComparisonBasedOnAttributesUsingLayout, IGraphic. Plot, IIO.SaveNetUsingLayout, IIO.SaveDemandFileUsingLayout, IIO.SaveAccessDatabaseUsingLayout, IIO.SaveToMsSqlServerDatabaseUsingLayout, IIO. SaveSQLiteDatabaseUsingLayout, ILists.CreateLineBlockingBaseList, ILists.CreateLineBlockingItemList, IEvaAssessmentType.ID, IEvaAssessmentType.Modes, IEvaAssessmentType.AddMode. Notes on how to replace these methods can be found in the description of the respective method in the COM help of PTV Visum 2022. **(22987)**

Data Model

⊕ Changed handling of RBC detectors: When using RBC controls, detectors on lanes that are identified with an RBC detector via the RbcNo attribute are now retained, even if they do not cover all relevant lanes from RBC's perspective. As a result, detectors remain in the network if they fit the RBC data model. **(24484)**

⊕ RBC and detectors: When opening and closing the RBC dialog, the previously automatic generation of queue detectors is omitted. Usually, these were unused detector objects. **(24478)**

Demand Procedures

⊕ ABM: The input data for a demand calculation with the software ActivitySim can be exported from Visum with the new procedure "Export ActivitySim input data". ActivitySim is not developed by PTV and is not part of the Visum installation. **(12132)**

⊕ ABM: The procedure "Generate path sequences from tours" now also sets the attribute PostDSegCode to the path sequence items. **(23676)**

⊕ Enhanced export of ABM trajectories to PTV Visum Publisher: The export of trips and tours from an ABM model to PTV Visum Publisher has been enhanced. In particular the option of spatial filtering has been enabled. **(20901)**

⊕ Output of number of required iterations for EVA: The number of actually required iterations of the procedure 'EVA distribution/mode choice' can now be stored in a selectable attribute of the demand stratum. **(24452)**

Dialogs

⊕ Use own virtual Python environment: An own virtual Python environment can be selected in the user preferences (under working environment) and then be used for the execution of scripts. **(24226)**

I/O Interfaces

⊕ Enhanced export of ABM trajectories to PTV Visum Publisher: The export of trips and tours from an ABM model to PTV Visum Publisher has been enhanced. In particular the option of spatial filtering has been enabled. **(20901)**

⊕ Export of SBA trajectories from a hybrid application: SBA trajectories from a macro-meso simulation with multiple meso areas can be exported to PTV Visum publisher. **(24391)**

⊕ Order of imported line routes for PuT supply from Visum: The import of a PuT supply from Visum now imports the line routes in the order of the average distance between the relevant locations (depending on the option stop point, nodes and intermediate points of links), i.e. line routes whose route course is determined very precisely by many relevant locations are imported first. This is relevant because the evaluation of subsequent routes takes into account the route courses of the already existing line routes. **(24348)**

⊕ Reading empty 'formation' elements during railML import: If a railML file contained a 'formation' without any reference to 'vehicles', during import (with vehicle data) it became a vehicle combination without vehicle units. Since such a combination can exist in Visum but has no permissible transport system and therefore cannot be used for vehicle journey sections, the information about the vehicle used was previously lost in this case. Now a placeholder vehicle unit is created in this case so that the vehicle information can be used in the target network. **(23821)**

⊕ Use of latest Access Database Engine: To access MS Access databases (reading and writing), the latest installed MS Access Database Engine is now used. In particular, this can be a newer version than the one installed with Visum. **(24245)**

Installation

- ⊕ Academic packages as product variants: Academic licenses are now configured differently than before. **(24428)**
- ⊕ Microsoft SQL Server Compact (SQLCE): The installation of SQLCE 4.0 is optional because it is required for the Safety module only. **(24283)**
- ⊕ Update CodeMeter Runtime: The CodeMeter Runtime deployed with PTV Visum has been updated to CodeMeter 7.50. **(24421)**

Junction Editor

- ⊕ Display of links: Options to restrict the display of links in the geometry view have been added in the graphic parameters of the junction editor. **(24181)**
- ⊕ Vissim previewer update: PTV Vissim node previewer has been updated to PTV Vissim version 2023. **(24356)**

Lists

- ⊕ More line breaks in column names: Line breaks in the column names of lists are now also possible within the individual components of the names, considering only useful separation points (hyphens, CamelCase identifiers). **(23240)**

Miscellaneous

- ⊕ Update of memory allocator: The memory allocator has been updated to a newer version. This improves the performance of some procedures and frees memory more quickly. **(21266)**

Network Comparisons

- ⊕ Output of synchronization status when copying to clipboard: When copying the structure of a model transfer file from the Tra viewer to the clipboard, the synchronization status is now also output for each node in the tree, i.e. the empty or filled circle, which indicates whether the 'same' object exists in the 'other' network or not. **(24442)**

Network Editor

- ⊕ Link orientations: The special function at links for recalculating link orientations has been removed (see ID 22550 and ID 21965). **(24138)**
- ⊕ Projections: PTV Visum supports the China Geodetic System 2000 (EPSG:4490 – EPSG:4555) **(23037)**

PrT Assignment

- ⊕ Ring Barrier Controller (RBC): For controllers of signalization type RBC the RBC DLL developed by PTV is used. This means that less data is displayed in the dialog of the controller. When saving the signal data, the extension .rbcd is used. **(24177)**

Safety

- ⊕ Check of the SQL Server CE installation: For the PTV Visum Safety module, the optional installation of MS SQL Server Compact Edition V4.0 must be switched on during the installation of PTV Visum. If this installation is missing, the Safety module now indicates this fact. **(24385)**

Visum Files

- ⊕ Version files: Reading and writing of line costing results for vehicle journey items have been accelerated. **(24150)**

✓ Fixed Bugs

COM-API

- ✓ Shortening of a line route deletes the route course: If one of the two ending line route elements were not specified when calling the ILineRoute.Shorten method, the complete course of the line route was deleted instead of taking the line route from its start or to its end. This error has been fixed. **(24349)**

Data Model

- ✓ Deleting a node results in invalid PrT paths: Deleting a node could result in invalid (userdefined) PrT paths. This error has been fixed. **(24351)**
- ✓ Deleting nodes too slow: Deleting nodes was too slow and has been accelerated. **(24435)**

- Deleting nodes with a lot of legs too slow: Deleting nodes with a lot of legs was too slow and has been accelerated. **(24453)**

Demand Procedures

- Crash when outputting path sequences in the Tour-based model: No more crashes when executing the 'Tour-based model - Combined trip distribution/mode choice' procedure if it outputs path sequences with a partitioning size (= number of persons represented by a path sequence) greater than 1. **(24332)**

Dialogs

- Access node of a stop area is not drawn as marked: When allocating an access node via the search in stop area dialog, the node selected was not drawn as marked in the network. This error has been fixed. **(24325)**
- Crash when creating a From-to zone based fare: No crash when creating a From-to zone based fare in the dialog 'Edit ticket type' if the fare is already complete, i.e. an entry already exists for all combinations of fare zones. **(24345)**
- Dialog 'Edit Symbol' too small: The dialog 'Edit Symbol' was too small to show all control in case of symbols allowing the display of additional characters. This bug has been fixed. **(24504)**
- Parameters for path search for line routes are not saved: The parameters for the path search as part of editing the course of a line route were not saved. This error has been fixed. **(24416)**

Graphical Procedures

- Public transport flow bundles for zone conditions with limited supply: The meaning of a PuT flow bundle condition for an origin/destination zone with limited supply was not consistently defined with regard to transport systems of type PuTWalk. This has changed. The condition is checked if PuTWalk is not allowed, but a link has been used for the access or egress. An access or egress is not considered as footpath if only connectors or walk links between stop areas within a stop have been used. **(24269)**

Graphics

- Graphic scale not correct when exporting as raster graphic: When exporting the network editor as a raster graphic, the graphic scale was not displayed in the correct size. This bug has been fixed. **(24448)**
- Infinite loop when drawing: When drawing the view in the network editor, Visum could enter an infinite loop. This error has been corrected. **(24413)**

I/O Interfaces

- Boarding or alighting permissibility sometimes incorrect when importing GTFS: When importing GTFS data, the boarding or alighting permissibility was set incorrectly in certain cases, in both directions, i.e. a boarding/alighting permitted according to the data could be prohibited as well as a boarding/alighting not permitted. This error has been fixed. **(24447)**
- Export to PTV Visum Publisher does not work with Proxy: Export to PTV Visum Publisher did not work if a proxy server with authentication was used for network communication. This error has been fixed. **(24360)**
- Incorrect element name in railML export: The railML export output an incorrectly named railML element 'passengers' (instead of 'passenger') for the description of vehicle units. Therefore, the underlying indications for seats and total seats could not be processed by reading systems. This error has been fixed. **(24516)**
- Number of lanes when importing OpenStreetMap: If a link in the OSM data has different numbers of lanes for one direction and the opposite direction, the link attribute Number of lanes was allocated incorrectly. In particular, the import could fail in certain cases. This error has been fixed. **(24387)**

Junction Editor

- Display when moving a node: When moving a node or main node, those parts of the network that were not affected by the change were no longer displayed. This error has been fixed. **(24466)**
- Options 'Leg template definition' and 'Define geometry template' missing: In the geometry view of the junction editor, the options 'Leg template definition' and 'Define geometry template' were missing in context menus. These are now restored. **(24257)**

Lists

- Crash when removing grouped columns: A crash no longer occurs when removing a column that is currently grouped from the column selection of a list. **(24483)**

Main Window

- Main menu could become inactive: Certain click sequences, especially in connection with editing signal programs, could cause the main menu to become inactive. This error has been fixed. **(24399)**
- Visum freezes on certain actions: On some computers, Visum seemed to freeze during certain actions (e.g. 'Network new' or loading a version file). This error has been fixed. **(24379)**

Network Comparisons

- Comparisons of objects from RBC controls incorrect: In network comparisons, objects belonging to RBC controls were not correctly identified with each other, causing incorrect differences between networks with RBC controls to be displayed in the network comparison. This error has been fixed. **(24434)**
- Simple network comparison also compares version comparisons: If the 'Compare all attributes' option was selected for the 'Compare current network with version file' function, this previously also included attributes that already belonged to an existing network comparison. Since comparison networks are not loaded transitively for the second network, this leads to unexpected differences even if identical networks containing a version comparison are compared. Therefore, as a rule, attributes belonging to version comparisons will be excluded from the selection in the future. **(24433)**
- Update note does not disappear: If the version file of the background network changes during a version comparison with the network loaded in the background, a notification bar appears in the main window with the option to reload the background network. This notification bar no longer disappeared when a new network was loaded in this situation, which removed the version comparison. This bug has been fixed. **(24446)**

Network Editor

- Opening turns when repairing zigzag routes: If zigzag routings were searched and turns had to be opened for a transport system when repairing these routings, the query appearing in this context did not have a 'Yes for all' button, so the question had to be answered for each turn. This bug has been fixed. **(24294)**
- Route course layer too slow: The calculation of the 'Route course' layer was too slow in complex networks and has been accelerated significantly. **(24441)**
- Simplifying the network creates incorrect time profiles: Under certain circumstances, the network editor's special function 'Simplify node-link network for public transport' could result in time profiles that did not follow the conventions in Visum (departure at the first time profile item at 00:00, no dwell time at the last time profile item). This error has been fixed. **(24300)**

PrT Assignment

- Crash during SBA for nodes with more than 16 legs: A crash no longer occurs when running a simulation-based dynamic assignment (SBA) if there are nodes with more than 16 legs in the network. **(24376)**
- Crash during SBA in network with invalid node geometry: A crash of the simulation-based dynamic assignment (SBA) no longer occurs in networks containing nodes with invalid node geometry. **(24492)**

Procedure Sequence

- Actions on procedure steps not possible: Various actions on procedure steps in the procedure sequence (e.g. "Create") were grayed out in certain situations. This error has been fixed. **(24469)**
- Incomplete application of procedure variables in the event of an error: If a procedure variable could not be applied, e.g. because the value was not within the permissible value range of the target attribute, this circumstance was pointed out with a warning, but further procedure variables were then not applied at all. This error has been fixed, i.e. invalid procedure variables with a warning are now ignored and all valid ones are applied. **(24485)**

PuT Assignment

- Service frequency incorrect in case of passenger trip chain and circle line transfer: The calculation of the timetable-based service frequency and the derived adjusted start wait time was incorrect if transfers were used on the relation that followed a passenger trip chain or a circle line transfer. This error has been fixed. **(24494)**

PuT Operating Indicators

- Times from passenger trip chains allocated incorrectly: The time of a passenger trip chain was previously allocated inaccurately if the passenger trip chain did not start or end at the beginning or end of the vehicle journey, but at one of the middle vehicle journey items (at which a vehicle journey section must then start or end). This affected the following indicators: Service time at vehicle journey item as well as at territory PuT detail vehicle journey item; stop time at stop point PuT detail. Also affected was the projection of passenger trip chain times to the analysis horizon and the distribution of passenger trip chain times to vehicle combinations in evaluations at detail levels with vehicle combinations. This error has been fixed. **(22840)**

PuT Passenger Survey

- ✅ Crash on check-in/check-out data: Crashes no longer occur when processing a single check-in/check-out record with incorrect timing. **(24436)**

Visum Files

- ✅ Correction of wrong node geometries from version files: When loading version files, node geometries for which the number of through lanes for a leg differs from the number of lanes of the underlying link are reset to the default geometry. They are then consistent in themselves, but may no longer be consistent with the desired modeling. Therefore, a warning is issued for the affected nodes and main nodes. **(24389)**
- ✅ Crash after loading a global layout with signal time-space diagram: Crashes no longer occur after loading a global layout file that produces a view that includes a signal time-space diagram. **(24458)**
- ✅ Crash when reading network files: Under certain circumstances, a crash could occur when reading a network file non-additively. This bug has been fixed. **(24291)**
- ✅ Double prompt for saving changes: If there were unsaved changes to data and, for example, the opening of a version file was started via the menu, the prompt whether the changes should be saved as a version file appeared twice. This bug has been fixed. **(24465)**
- ✅ Format change for timestamps in the version file: The internal format in which timestamps are written to the version file has changed. As a result, the timestamps of the individual iterations could no longer be read in the various PrT assignment quality lists if the assignment was carried out with PTV Visum 2022 or earlier and then saved as a version file. **(24438)**

❗ Breaking Changes

Visum Files

- ❗ Format change for timestamps in the version file: The internal format in which timestamps are written to the version file has changed. As a result, the timestamps of the individual iterations could no longer be read in the various PrT assignment quality lists if the assignment was carried out with PTV Visum 2022 or earlier and then saved as a version file. Running the assignment again once with PTV Visum 2023 fixes the problem. **(24438)**

2023.00-00 [247197]   2022-07-25

⊕ New Features and Changes

ANM

- ⊕ ANM import with negative link offset: Files that contain negative values for link offsets can now be imported. More specifically, negative values for the attributes ELO and SLO are now possible. **(24030)**
- ⊕ Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). **(23489 ❗)**
- ⊕ Transport systems for lanes and lane turns: For the definitions of transport systems on lanes and lane turns the following conventions apply: All transport systems permitted for a lane (lane turn) must also be permitted on the link (turn or main turn). Accordingly, adjustments are made automatically when the TSysSet of the link (turn or main turn) changes. The transport system set allowed on through lanes must be identical at the FromNode and at the ToNode. Transport systems of type PuTWalk are no longer allowed on lanes. **(23930 ❗)**

COM-API

- ⊕ Add or Delete Operations: Due to the introduction of nested groups, the semantics of the COM functions IOperations::AddOperation and IOperations::RemoveOperation have changed. **(24079 ❗)**
- ⊕ COM access to the parameters of PuT Isochrones: At IIsochrones a new method ExecutePuTWithParameterObjects([in] INetElements * NetElms, [in] IPuTIsochroneBasePara * BaseParameters, [in] IPuTIsochroneRequestPara * RequestParameters) has been implemented. The methods CreatePuTIsochroneBaseParameters and CreatePuTIsochroneRequestParameters for creating the parameter objects were also added there. **(22004)**
- ⊕ COM list interface: Releasing a COM list interface no longer causes the associated list to be closed if Show() was previously called. The Detach() method is thus unnecessary and has been removed. Close() can be used instead to explicitly close a list. **(23290 ❗)**

⊕ Renaming of directions: To resolve naming conflicts, the 'Direction' enumeration type, which specifies the direction of connectors, has been renamed to 'ConnectionDirection', and the network object type 'PuT direction' (ID 'Direction') has become 'PuTDirection'. **(22905 🔴)**

Data Model

⊕ Elimination of the Start time in the demand description: The attributes "Start time' and 'Start day index' in the demand description have been removed. This means that the Start day/Start time and the End day/End time of time series are considered as absolute times. When reading version files saved with Visum 2022 or earlier, in which start times not equal to zero were used in the demand description, copies of the time series are created taking the start time into account. The new time series then are allocated to demand segments. **(22367)**

⊕ Generate zones for stop areas: Converting stop areas into zones allows to reallocate data from stop area matrices. The function creates the corresponding zones without deleting the existing ones and adjusts the dimensions of each matrix accordingly. The connection of the new zones is also done automatically. **(22011)**

⊕ Parameters of signal offset optimization: The parameters of the signal offset optimization have been removed from the General procedure settings. They have been integrated into the new procedure 'Network-wide signal optimization' (see ID 11327). **(23103)**

⊕ Recalculation of link orientations: For the recalculation of link orientations implemented in Visum 2022 (ID 22550), the conditions for combining two links into one leg have been extended. Two links are combined into one leg if the absolute angle between the links is less than 10 degrees or the two links lead to the same main node. **(23453)**

⊕ Renaming of directions: To resolve naming conflicts, the 'Direction' enumeration type, which specifies the direction of connectors, has been renamed to 'ConnectionDirection', and the network object type 'PuT direction' (ID 'Direction') has become 'PuTDirection'. **(22905 🔴)**

⊕ Userdefined Groups: A new network object 'Userdefined groups' has been added with its own list. Userdefined attributes (UDA) can be allocated to one userdefined group to improve the overview of userdefined attributes in a model. **(24132)**

Data Model, COM-API

⊕ Attribute groups: Attribut groups are defined enumerations that now have ID status. English identifiers are to be used with the COM interface. **(22770 🔴)**

Demand Procedures

⊕ ABM: A synthetic population generated with the software PopulationSim can be read into Visum with a new importer. PopulationSim is not developed by PTV and is not part of the Visum installation. **(23759)**

⊕ ABM: The new procedure "Start ActivitySim" starts the ABM software ActivitySim. ActivitySim must be installed on the computer beforehand. ActivitySim is not developed by PTV and is not part of the Visum installation. **(23758)**

⊕ ABM: The result data of a demand calculation with the software ActivitySim can be read into Visum with a new importer and alternatively with the new procedure "ActivitySim Import". ActivitySim is not developed by PTV and is not part of the Visum installation. **(24065)**

⊕ Path sequence activities: New path sequence activities can be created in the List (Path sequence activities). **(24014)**

Dialogs

⊕ Better explanation of the options for connector shares (PrT): In the general procedure settings, the user interface has been improved so that the meaning of the various options is clearer. Furthermore, messages are issued if the selected option is not effective or only effective to a limited extent due to overrides of individual zones. **(20464)**

⊕ Easier access for editing time-varying attributes: Editing of time-varying attributes is now accessible from the context menu in the lists of the respective network objects as well as from the context menu in the network editor, as well as from context menus in the embedded lists in the lower part of the junction editor and on a selection of a corresponding network object (e.g. for a marked leg) in the geometry view of the junction editor. **(23732)**

⊕ Moving classes in the graphic parameter dialog: For the classified display with alphanumeric attributes classes can be moved upwards and downwards using new buttons ('Move marked classes upwards / downwards'). If numeric attributes are selected, the buttons are greyed out. **(22831)**

⊕ New control: A new control for managing global layouts, filter and graphic parameter files has been added. This control makes it easier to add new files, delete or rename existing files. **(19123)**

⊕ Preview in the attribute selection dialog: The attribute selection dialog for lists and other tabular views has a 'Preview' button that displays the currently selected layout in the respective window as it will appear when confirming with OK. **(21671)**

⊕ User-defined attributes in the attribute selection dialog: In addition to creating user-defined attributes (UDA) in the attribute selection dialog, it is also possible to edit and delete UDA in this dialog. **(19020)**

Filters

- ⊕ Formulas as filter condition: In filters boolean formulas can be used as condition. These can also be combined with other conditions. The condition of the formula row is fulfilled if the value 'True' is returned. **(22602)**

Formulas

- ⊕ Formulas as filter condition: In filters boolean formulas can be used as condition. These can also be combined with other conditions. The condition of the formula row is fulfilled if the value 'True' is returned. **(22602)**

Graphics

- ⊕ Fill Style: For object hatching, both the foreground and background colors can be set. Transparent colors are still possible. **(22373)**
- ⊕ Line route course display: Line routes can be aggregated by any attributes and displayed classified in the network editor. **(22497)**
- ⊕ Line route course display: The order of the displayed line routes in the legend can now be defined in the graphic parameters of the route course display. The order can be changed by sorting by any attribute in the dialog and thus influences the display in the legend. **(19245)**
- ⊕ Rotation of bar labels: Bar labels of links can be rotated interactively. In addition, there is a new link attribute 'Bar text angle' that can be used to specify the angle and a new special function 'Initialize rotation angle' to restore the default. **(22426)**
- ⊕ Route course: The aggregation level of the displayed route course can be subdivided by user-defined groups. If possible, the route courses of a grouping are not mixed with other groups during display. The legend label inserts a separate subheading for each grouping. **(22600)**

I/O Interfaces

- ⊕ GTFS Import: The General Transit Feed import has been accelerated. **(23680)**
- ⊕ GTFS Import: The optional courses of the line routes are now read in as intermediate link points and no longer as nodes. This simplifies and speeds up the import process. **(23701)**
- ⊕ GTFS Import: The optional file 'frequencies.txt' contains headways and time periods for certain journeys in the timetable. This file is now taken into account in the import and copies of the vehicle journeys are inserted according to duration and headway. **(18252)**
- ⊕ GTFS import with selectable calendar: When importing GTFS, it is possible to explicitly specify the type of calendar of the resulting network. In particular, this enables the import of a selected week into a network with a weekly calendar. Importing a key date into a network without a calendar is still possible. **(24148)**
- ⊕ HAFAS Import: The optional file 'Line' contains various meta-information about the line. This file will now be considered in the HAFAS import. **(20316)**
- ⊕ Open Street Map Import: Elevation data, stored at nodes in OSM format (key:ele), will be transferred to the z-coordinate of the node and via points in PTV Visum during the import. **(23726)**
- ⊕ Open Street Map Import: In rare cases, elevation data is modeled as 'tags' at the nodes in OSM. The provided configurations "Detailed Urban Road and Railway Network" and "Detailed Urban Bicycle Network" read these data and write these elevation data to the node in PTV Visum. **(19034)**
- ⊕ Open Street Map Import: The configuration "Detailed urban bicycle network" additionally transfers links and attributes that are relevant for the route search and bicycle assignment. **(23014)**
- ⊕ Open Street Map Import: The configuration "Detailed urban bicycle network" additionally transfers the information about the official classified cycle route network **(23446)**
- ⊕ PuT supply from Visum: Base data from the target network can be assigned to the data to be imported. If there is an object with the same key and attributes in the target network, the object from the target network is used. **(17430)**
- ⊕ PuT supply from Visum: For improved routing of line routes in the target network, the location of intermediate points of links from the source network is used optionally. **(23488)**
- ⊕ PuT supply from Visum: If direct walk links between stop areas exist in the source network, e.g. from the transfer.txt of the GTFS format, it is checked after the import whether such a path also exists in the target network. If not, such a connection will be created. **(23783)**
- ⊕ PuT supply from Visum: Turns over acute angles and especially U-turns are uncommon in public transport routing. Therefore, such maneuvers receive a malus during routing. A different course becomes more likely. **(23598)**
- ⊕ Replace boundaries from shape file for POI: When importing shape files additively, the boundaries of POIs can now also be replaced, analogously to other two-dimensional network object types. **(20201)**

Installation

- ⊕ Python: Python is only installed as part of the Visum installation below the Visum EXE directory. Python is no longer installed separately from Visum. The corresponding parts have been removed from the Visum setup. **(22437)**
- ⊕ Update of Python libraries: The Python libraries of the Python installation under Visum have been updated to newer versions. **(24050)**

Lists

⊕ Path sequence activities: New path sequence activities can be created in the List (Path sequence activities). **(24014)**

⊕ Userdefined Groups: A new network object 'Userdefined groups' has been added with its own list. Userdefined attributes (UDA) can be allocated to one userdefined group to improve the overview of userdefined attributes in a model. **(24132)**

Main Window

⊕ New buttons for tool window Network: The tool window 'Network' has new buttons to switch the visibility of the rows in the tool window as well as all filters. **(22188)**

⊕ Open working directory in Explorer: An entry 'Open working directory' has been added under Menu File to open the current working directory in the Explorer. **(23768)**

Matrix Estimation

⊕ Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). **(23489 ⓘ)**

Network Editor

⊕ Determine Couplings: A new special function is searching within active vehicle journeys for plausible couplings. Couplings are created between vehicle journeys that run on a common section with the same departure and arrival time. Additional conditions are optional. **(21668)**

⊕ Legend: The width of the legend is optionally adjustable. For this purpose, the width of a legend element can be set via drag and drop. It is possible to specify an exact width in the legend dialog. Line breaks are inserted automatically. Minimum widths are complied. **(19424)**

⊕ Simplify Node-link network for public transport: The function for simplifying a node-link networks for public transport takes the intermediate points of links into account. **(24004)**

Other Procedures

⊕ Drawing of random numbers: In line blocking with vehicle interchange and in headway offset optimization, random numbers are drawn within the genetic algorithm. This drawing has been improved. **(22605 ⓘ)**

⊕ Network-wide signal optimization: The procedures 'Signal offset optimization' and 'Signal offset analysis' have been integrated into the new procedure 'Network-wide signal optimization'. This procedure can be used to optimize and analyze offset times for all type of controllers. In addition, it is suitable for the network-wide optimization, i.e. green time, cycle time and offset optimization, for Vissig controllers with stage-based signal programs as well as controllers of type RBC. **(11327 ⓘ)**

⊕ Noise protection on roads: The new version of the German FGSV guideline for noise protection on roads (RLS 19) replaces the guideline RLS 90. PTV Visum calculates the emission value of the length-related sound power level per direction of travel. This replaces the calculation of the average noise level according to RLS 90. **(21158)**

⊕ Parameters of signal offset optimization: The parameters of the signal offset optimization have been removed from the General procedure settings. They have been integrated into the new procedure 'Network-wide signal optimization' (see ID 11327). **(23103)**

⊕ Settings for t0 of main turns: There is an additional option to set t0 of main turns. This option allows to sum up the time from the shortest path search and the default value from turns standards. **(10976)**

⊕ Update of HBEFA to version 4.2: The emission calculation according to HBEFA has been updated to the current version HBEFA 4.2. To use this calculation, the corresponding HBEFA data package version 4.2 must be installed. **(24007 ⓘ)**

⊕ Value of diagonal for skims from path sequences: The value of the diagonal for skims from path sequences can be set. The corresponding options are similar to other skims. **(21350)**

PrT Assignment

⊕ BFW with impedance method ICA for nodes: For the assignment method Bi-conjugate Frank-Wolfe (BFW) an option has been added to enable the node impedance calculation (ICA) during assignment. **(23364)**

⊕ Blocking back in combination with MPA: The blocking back calculation in networks where connector shares are used for each individual relation (MPA) is now performed on the actually calculated assignment paths and thus consistent with a subsequent calculation. Furthermore, the combination of the blocking back model with dynamic assignments is now explicitly prohibited. **(23122 ⓘ)**

- Calculation of PrT skim matrices: The procedure 'Calculate PrT skim matrix' has been modernized. This results in a reduction of memory consumption and run time. **(20670 ⓘ)**
- Evaluation of OD pair filter: The evaluation of the OD pair filter has been accelerated by improving iterations over assignment paths. **(23572)**
- Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). **(23489 ⓘ)**
- Incremental assignment: The incremental assignment has been modernized. **(23078 ⓘ)**
- Macro-meso hybrid simulation: The simulation-based assignment (SBA) has been extended to allow for a macro-meso hybrid simulation. If this option is selected, the links on which a mesoscopic simulation is performed are identified by a non-zero attribute value. On the remaining links, vehicles are propagated with the travel time determined by the VD functions. **(23849)**
- Modeling of roundabouts for SBA: The behavior of vehicles in roundabouts has been improved. The modeled lane turns for roundabouts, which so far were ignored in the simulation, determine which lanes are used by vehicles on the approach and exit. Within multi-lane roundabouts, unnecessary lane changes and conflicts between vehicles entering and vehicles in the roundabouts are avoided. **(23306 ⓘ)**
- Modeling of temporary lane closures in SBA: In the simulation-based assignment (SBA), temporary lane closures for one or more transport systems can be modeled by using the time-varying attribute Transport system - Set for lanes. **(23639)**
- Parameters for calculating skim matrices: Simplifications have been made in the dialog for the calculation of skim matrices. The column 'Open' has been removed. Also, the the options to save the means of transport number and 'Confirming overwriting (both PrT only) are removed. **(23550)**
- Reset of assignment results: Under certain circumstances, assignment results were automatically discarded by Visum before executing the procedure sequence, even without running the 'Delete assignment results' procedure. **(24108 ⓘ)**
- SBA with evaluations for lanes: In SBA, additional results for lanes are provided. These are results from the simulation and can be found in the list for lanes. A distinction is made between results for the junction area and the remaining part of the link. **(22262)**
- Transport systems for lanes and lane turns: For the definitions of transport systems on lanes and lane turns the following conventions apply: All transport systems permitted for a lane (lane turn) must also be permitted on the link (turn or main turn). Accordingly, adjustments are made automatically when the TSysSet of the link (turn or main turn) changes. The transport system set allowed on through lanes must be identical at the FromNode and at the ToNode. Transport systems of type PuTWalk are no longer allowed on lanes. **(23930 ⓘ)**
- Usage of weights for connectors: The usability of methods for connectors has been improved, in particular, unused attributes such as the weights of connectors are grayed out if they are not relevant. **(21494)**

Procedure Sequence

- Groups: Several groups can be duplicated and moved within the procedure sequence. **(20861)**
- Nested groups: The previous possibility to divide procedures into groups has been extended to subgroups. Groups can now be nested with each other to any depth. **(23218)**

PuT Assignment

- From the procedure 'PuT relation-based analysis', skims are derived from existing routes as stop area matrices. Matrices representing passenger journeys are now generated and stored as demand matrices and no longer as skim matrices. **(23813)**
- Headway-based Assignment: In rare cases, when two connection options have very high costs, their utility is numerical '0'. Previously, none of these options were then chosen. Now, this is reported to the user and the volume is distributed equally between both connections. **(23580 ⓘ)**
- Parameters for calculating skim matrices: Simplifications have been made in the dialog for the calculation of skim matrices. The column 'Open' has been removed. Also, the the options to save the means of transport number and 'Confirming overwriting (both PrT only) are removed. **(23550)**
- Usage of weights for connectors: The usability of methods for connectors has been improved, in particular, unused attributes such as the weights of connectors are grayed out if they are not relevant. **(21494)**

PuT Line Blocking

- Convert line block item to empty trip: The line block item of a vehicle journey can be converted into an empty trip. The vehicle journey itself remains unaffected. **(23140)**
- Drawing of random numbers: In line blocking with vehicle interchange and in headway offset optimization, random numbers are drawn within the genetic algorithm. This drawing has been improved. **(22605 ⓘ)**

PuT Passenger Survey

- ⊕ Plausibilization: The maximum deviation of survey data to the real departure time can now be specified separately to positive and negative deviation. Thus, different time periods can be defined here. **(15649)**
- ⊕ Processing of check-in & out ticket data: Two dedicated modes are now available for the plausibilization of mass data from access control systems (Check-In & Check-Out). Those allow performing the necessary short path searches much more performant and thus to save runtime. The minimum required information of one dataset has been reduced to start and end stop, as well as a time stamp. **(22747)**
- ⊕ Rename 'Read survey data' / 'Plausibilization of survey data': The two procedures have been renamed in some languages 'Read survey data' / 'Plausibilization of survey data' to clarify their purpose. **(23628)**

Scenario Management

- ⊕ Database of the calculation server: The database of the calculation server was changed to SQLite. **(24038)**

Timetable Editor

- ⊕ Access via the context menu: Access to both timetable editors, graphical and tabular, is available via the context menu for additional network elements. **(23556)**

⊗ Breaking Changes

COM-API

- ⊗ Add or Delete Operations: Due to the introduction of nested groups, the semantics of the COM functions IOperations::AddOperation
and IOperations::RemoveOperation have changed. If groups exist, the behavior of these functions may change. **(24079 ⊕)**
- ⊗ COM list interface: Releasing a COM list interface no longer causes the associated list to be closed if Show() was previously called. The Detach() method is thus unnecessary and has been removed. Close() can be used instead to explicitly close a list. Scripts may need to be adjusted. **(23290 ⊕)**
- ⊗ No OR group when adding Active net objects conditions for flow bundles: When inserting an Active net objects condition using CreateConditionActive... or CreateConditionSelected... to IFlowBundle, a new OR group was always created until now. This prevented such conditions from being combined with other conditions using AND. This error has been fixed. This changes the behavior when several conditions, including an Active net elements condition, have been inserted one after the other via COM. To achieve the OR combination of conditions as before, a new group must be explicitly created by calling CreateNewGroup. In addition, the ExecuteActiveTimeProfiles method has been removed. **(24296)**
- ⊗ Renaming of directions: To resolve naming conflicts, the 'Direction' enumeration type, which specifies the direction of connectors, has been renamed to 'ConnectionDirection', and the network object type 'PuT direction' (ID 'Direction') has become 'PuTDirection'. **(22905 ⊕)**
- ⊗ SEH exception handling: COM methods previously contained exception handling for SEH exceptions. This has been removed to make severe exception visible to the user, i.e. result in a program crash. **(23110)**

Data Model, COM-API

- ⊗ Attribute groups: Attribut groups are defined enumerations that now have ID status. English identifiers are to be used with the COM interface. Since it also affects the return value of the attribute group, scripts must be adapted. **(22770 ⊕)**

Data Model, PrT Assignment

- ⊗ New logic for attribute 'TurnedOff' of signal controllers: The attribute 'TurnedOff' of signal controllers is no longer an input attribute, but is derived directly from the selected signal program. The signal controller is considered to be turned off if the signal program 0 (for Vissig controller) or 99 (for RBC controller) is selected or if an invalid signal program number is set. Signal controllers that previously had a valid signal program number but the signal controller was explicitly turned off are now no longer considered turned off, which correspondingly changes the results of all procedures that use that signal controller. **(23993)**

Data Model, Visum Files

- ⊗ Attribute link number at lanes: The attribute for the link number of lanes used to always contain the number of the incoming link of the leg, even if the leg combines two opposite links and thus the relevant link of the lane for incoming and outgoing lanes are different. This bug has been fixed, i.e. the attribute now always outputs the number of the relevant link of the lane. This also affects network files because the interpretation of the key changes. Network files written with PTV Visum 2023 and later are therefore misinterpreted by PTV Visum 2022 and earlier when there are legs with opposite links combined. **(23697)**

Other Procedures

- Network-wide signal optimization: The procedures 'Signal offset optimization' and 'Signal offset analysis' have been integrated into the new procedure 'Network-wide signal optimization'. This procedure can be used to optimize and analyze offset times for all type of controllers. In addition, it is suitable for the network-wide optimization, i.e. green time, cycle time and offset optimization, for Vissig controllers with stage-based signal programs as well as controllers of type RBC. The results of the offset optimization will change. **(11327 ⊕)**
- Update of HBEFA to version 4.2: The emission calculation according to HBEFA has been updated to the current version HBEFA 4.2. To use this calculation, the corresponding HBEFA data package version 4.2 must be installed. Due to a change in the distribution of vehicle strata, the adjustments made to the fleet compositions when reading version files from previous release versions of Visum should be checked. The results of the emission calculation change due to the update. **(24007 ⊕)**
- Analysis of the offset times of signal controllers reacts to a constant shift: The results of the procedure 'Signal offset analysis' (now part of the procedure 'Network-wide signal optimization') depended on the absolute amount of the offset, i.e. the procedure resulted in different values if the offsets of all involved signal controllers were changed by the same value. This error has been fixed. This changes the results of the analysis of the offset times. **(24005)**

PrT Assignment

- Blocking back in combination with MPA: The blocking back calculation in networks where connector shares are used for each individual relation (MPA) is now performed on the actually calculated assignment paths and thus consistent with a subsequent calculation. This changes the PrT assignment results of static assignments in combination with the blocking back model. Furthermore, the combination of the blocking back model with dynamic assignments is now explicitly prohibited. **(23122 ⊕)**
- Calculation of PrT skim matrices: The procedure 'Calculate PrT skim matrix' has been modernized. This results in a reduction of memory consumption and run time. As a result, calculation results may change slightly. **(20670 ⊕)**
- Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). This changes the calculation results of the procedure. **(23489 ⊕)**
- Incremental assignment: The incremental assignment has been modernized. This may change assignment results. **(23078 ⊕)**
- Modeling of roundabouts for SBA: The behavior of vehicles in roundabouts has been improved. The modeled lane turns for roundabouts, which so far were ignored in the simulation, determine which lanes are used by vehicles on the approach and exit. Within multi-lane roundabouts, unnecessary lane changes and conflicts between vehicles entering and vehicles in the roundabouts are avoided. These improvements will change results of SBA. **(23306 ⊕)**
- Removal of the option 'Ignore turns' in the dynamic stochastic assignment: The dynamic stochastic assignment offered previously an option 'Ignore turns' to save memory. This option has been removed. The impedances of turns are now always considered correctly. This changes the results of the dynamic stochastic assignment if the option was set (default). **(23211)**
- Reset of assignment results: Under certain circumstances, assignment results were automatically discarded by Visum before executing the procedure sequence, even without running the 'Delete assignment results' procedure. This is now no longer the case. The procedure 'Delete assignment results' must be inserted to reproduce the behavior. **(24108 ⊕)**
- Transport systems for lanes and lane turns: For the definitions of transport systems on lanes and lane turns the following conventions apply: All transport systems permitted for a lane (lane turn) must also be permitted on the link (turn or main turn). Accordingly, adjustments are made automatically when the TSysSet of the link (turn or main turn) changes. The transport system set allowed on through lanes must be identical at the FromNode and at the ToNode. Transport systems of type PuTWalk are no longer allowed on lanes. When reading models saved with release versions of Visum 2022 and older, transport systems on lanes and lane turns are adjusted automatically to follow these conventions. **(23930 ⊕)**

PuT Assignment

- Headway-based Assignment: In rare cases, when two connection options have very high costs, their utility is numerical '0'. Previously, none of these options were then chosen. Now, this is reported to the user and the volume is distributed equally between both connections. This can change assignment results in rare cases. **(23580 ⊕)**
- Incorrect calculation in the headway-based assignment using Logit as a choice model: The calculation of the shares when using a discrete choice model between stay on board and alight in the headway-based assignment was incorrect. This error has been fixed. The results of the headway-based assignment change when using this choice model. **(22658)**

PuT Line Blocking

⚠ Drawing of random numbers: In line blocking with vehicle interchange and in headway offset optimization, random numbers are drawn within the genetic algorithm. This drawing has been improved. As a result, results can change. **(22605 ⊕)**

PuT Operating Indicators

⚠ Incorrect projection of indicators related to line blocking for AH: In certain situations, the projection of indicators related to line-blocking (empty time, empty km, number of vehicles in proportion to length and time) to the analysis horizon (AH) was not correct. Affected are the indicators at the line hierarchy as well as at area PuT detail objects. Furthermore, link costs at the objects of the line hierarchy can also be affected. This error has been fixed. **(23596)**

Visum Files

⚠ Attribute 'Transfer priority' at stop areas missing in version file: The attribute 'Transfer priority' of stop areas was missing in the version file so far, i.e. after writing and subsequent reading all stop areas had the default value. This error has been fixed. **(23346)**

ANM

⚠ Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). This changes the calculation results of the procedure. **(23489 ⊕)**

⚠ Transport systems for lanes and lane turns: For the definitions of transport systems on lanes and lane turns the following conventions apply: All transport systems permitted for a lane (lane turn) must also be permitted on the link (turn or main turn). Accordingly, adjustments are made automatically when the TSysSet of the link (turn or main turn) changes. The transport system set allowed on through lanes must be identical at the FromNode and at the ToNode. Transport systems of type PuTWalk are no longer allowed on lanes. When reading models saved with release versions of Visum 2022 and older, transport systems on lanes and lane turns are adjusted automatically to follow these conventions. **(23930 ⊕)**

Data Model

⚠ Renaming of directions: To resolve naming conflicts, the 'Direction' enumeration type, which specifies the direction of connectors, has been renamed to 'ConnectionDirection', and the network object type 'PuT direction' (ID 'Direction') has become 'PuTDirection'. **(22905 ⊕)**

Matrix Estimation

⚠ Improvement of the procedure PDV: The procedure 'Pseudodynamic Volumes (PDV)' has been improved. This allows the use of the dynamic results in other procedures of postprocessing, especially for the dynamic matrix estimation as well as the export of routes to PTV Vissim (via ANM). This changes the calculation results of the procedure. **(23489 ⊕)**

Other Procedures

⚠ Drawing of random numbers: In line blocking with vehicle interchange and in headway offset optimization, random numbers are drawn within the genetic algorithm. This drawing has been improved. As a result, results can change. **(22605 ⊕)**