PTV Visum 2024 Release Notes

Last modified: 2024-02-20

https://www.ptvgroup.com/en/support-visum/

2024.01-04 [274810] — 2024-02-19

New Features and Changes

Graphics

- Offset of the background map in relation to the network in some projections: When using certain projections for the network, there was an offset between the network and the background map displayed. This phenomenon is known for the British National Grid, EPSG:5514 (Czech Republic), and MGI (Austria) projections. This error has been fixed. **(213282)**

Installation

- Python update: The Python installation included in the Visum installation has been updated from version 3.11.4 to 3.11.8. The Python package certifi has also been updated to version 2024.2.2. **(201599)**
- Update of various components: Several components used in Visum have been updated to eliminate some known vulnerabilities. **(201768)**

Fixed Bugs

COM-API

- Filters for locations and restricted traffic areas: If filters for locations or restricted traffic areas were accessed via COM, Visum used to crash. This error has been fixed. **(212635)**

Data Model, Lists

- Editing user-defined POI attributes: Editing user-defined attributes of POI categories sometimes failed when POI categories were arranged hierarchically. This error has been fixed. **(194905)**

Dialogs

- Pasting attribute IDs from the text editor not possible: If an attribute ID is copied to the clipboard in an attribute selection dialog or at other relevant places, it can be pasted again via the shortcut menu in the attribute selection dialog. However, if the text was saved in a text editor in the meantime (and sent by email, etc.) and copied back to the clipboard, it was no longer possible to paste it. This error has been corrected. **(185532)**

Graphical Procedures

- Flow bundle: In a PuT flow bundle, you can select the option "Display only supply at <>" (<> can be a node or a link, for example) in the "Supply" tab of the "Edit flow bundle" dialog to restrict the set of transport systems that are displayed in the corresponding list in the dialog. This option did not work in the past. This has been fixed. **(179520)**
- Shortest path search: When importing a graphic parameters file that contained a shortest path search, the source or destination zones of the search were previously not displayed in the "Selected network objects" list in the shortest path search dialog (graphic tools). This has now been corrected. **(181486)**

I/O Interfaces

- Crash when exporting user-defined tables to Publisher: Crashes no longer occur when exporting the data of a user-defined table to Publisher. However, the export itself still does not work. **(217429)**
- Import of network data from Visum did not check parameters: The import parameters were previously insufficiently checked when importing network data from Visum ('Network Updater'). As a result, incorrect settings, e.g. in the attribute allocations, could lead to the import having no effect. There was also no note indicating this. This error has been fixed. **(210414)**
- Import of public transport supply from Visum: Under certain circumstances, when importing public transportation from Visum, an error message appeared stating that no link could be found between identical nodes. In some cases, this caused Visum to crash. This error has been fixed. **(210537)**

- Various problems in the ABM trajectory export to Publisher: The export of trajectories of the type 'ABM trips and activity executions' to Publisher generated invalid export results in some constellations, which could not be further processed by Publisher. In addition, no suitable paths were often found in the network for trips made by PuT for no reason. These errors have been fixed. The export process has also been accelerated. **(209604)**

Installation

- Startup accelerated: The program startup has been accelerated slightly. **(215337)**

Junction Editor

- Incorrect geometry of roundabouts with certain coordinate systems: When using certain geodetic coordinate systems, the display of roundabouts in the junction editor was incorrect. This error has been fixed. **(216025)**

PrT Assignment

- Blocking-back model did not provide volumes for restricted traffic areas: When using the blocking-back model, no volumes were calculated for restricted traffic areas of the 'area toll (pay once)' type, and therefore no revenue was generated. This particularly affected the assignment with ICA. This error has been fixed. **(212464)**
- Grayed out attributes after SBA assignment: After an assignment with SBA, links and nodes attributes are displayed grayed out if they are not used. When using the macro meso hybrid simulation, however, the grayed-out attributes should only apply to network objects in the meso area. This restriction was previously not correctly considered for node attributes. This is now fixed. **(191843)**
- Handling of turns that are considered blocked by ICA: If the node impedance calculation evaluated a turn as blocked that was considered open in the data model by its TSysSet, inconsistencies could occur in the assignment with ICA because the underlying PrT assignment could determine paths via this turn. This error has been fixed by first carrying out an ICA calculation and then treating all turns identified as blocked by the ICA calculation as blocked turns in the data model. This case could occur in particular at roundabouts that were calculated according to Kimber-Hollis. In Visum 2023, the behavior remains unchanged by default. To activate the new method, a user-defined attribute with ID 'ICAAssignment_Consider_TurnBlocking_From_ICA' and value 'true' must be created for the network. **(209765)**
- LUCE with area toll: If a restricted traffic area of the area toll type contained a closed link, the calculation was previously canceled with a technical error message. This error has been fixed. **(212305)**

Scenario Management

- Restore window layout when resuming editing a modification: If an intermediate state is saved when editing a modification and editing is later canceled, you can optionally return to this saved intermediate state. However, the view set up for editing (window layout) was previously lost. This error has been fixed. **(209046)**

Subnetwork Generator

- Detailed impedance definition with formula UDA: Impedance definitions with a user-defined formula attribute were previously not correctly taken into account in the subnetwork generator. This error has now been fixed. **(198308)**

Timetable Editor

- 'Draw to scale' in graphical timetable incorrect: In the graphical timetable, the 'Draw to scale' setting was interpreted incorrectly for scales smaller than 1:1. As a result, less rather than more information was displayed when zooming in. This error has been fixed. **(164821 | 24997)**

Visum Files

- Formulas in model transfer files formatted incorrectly: Formulas were incorrectly represented in model transfer files (comma as separator between arguments instead of semicolon). Model transfer files with such formulas cannot be read in. This error has been fixed. **(215767)**
- Incomplete error messages for empty mandatory attributes in attribute files: If the column for a mandatory attribute was present in a network file or database, but did not contain a value for a network object (empty string), this resulted in an incomplete error message without specifying the affected row and column. This occurred, for example, in transport systems with an empty type attribute or demand segments with an empty code. This error has been fixed. **(214348)**

Breaking Changes

PrT Assignment

- Handling of turns that are considered blocked by ICA: If the node impedance calculation evaluated a turn as blocked that was considered open in the data model by its TSysSet, inconsistencies could occur in the assignment with ICA because the underlying PrT assignment could determine paths via this turn. This error has been fixed by first carrying out an ICA calculation and then treating all turns identified as blocked by the ICA calculation as blocked turns in the data model. This case could occur in particular at roundabouts that were calculated according to Kimber-Hollis. In Visum 2023, the behavior remains unchanged by default. To activate the new method, a user-defined attribute with ID 'ICAAssignment_Consider_TurnBlocking_From_ICA' and value 'true' must be created for the network. This changes the results of the assignment with ICA, especially when based on existing assignment results. **(209765)**

2024.01-03 [272708] 2024-01-11

New Features and Changes

Assignment PrT

- Cycle length on semi-actuated intersections: The calculated cycle length on semi-actuated intersections now depends on the coordinated flags in the Phasing and Timing sub-table. If there is at least one coordinated signal group, the calculated cycle length depends on the splits and will be identical to the cycle length that was set on the controller, if the data was set up consistently. If there is no coordinated phase, the cycle length will depend on demand. In earlier versions, the cycle length on semi-actuated controllers was always based on the splits, even if there were no coordinated phases. **(205739)**

Demand Procedures

- Handling of 'No path found' in ABM: In the two procedures 'ABM Nested Demand' and 'ABM long-term location choices', the case where no path is found for a person when choosing a destination is now better taken into account. If no path is found for a destination, it is excluded from the choice. If all potential destinations are excluded from the choice, this choice and all others on the same tour remain open and a message is issued. Persons with open choices are excluded from the destination constraint in the course of long-term choices, again dealing with the case where too many persons are excluded to be able to achieve a meaningful balance. **(197395)**
- Long-term choices in parallel: The procedure 'ABM long-term location choices' can now be calculated using multiple cores and has been accelerated accordingly. **(201211)**
- More iterations for long-term choices: The number of iterations in the final balancing step of the 'ABM long-term location choices' procedure has been increased to allow more models to reach a converged solution. **(209672)**
- New methodology for destination constraint in ABM long-term choices: The procedure 'ABM long-term location choices' now uses an improved methodology for destination constraint. **(191766)**
- Optionally exclude internal traffic in ABM: The new 'Allow internal traffic' option can be used in the 'ABM long-term location choices' and 'ABM Nested Demand' procedures to control whether or not shortest paths from a location back to itself are allowed. **(204098)**
- Time-dependent attributes for activity executions in ABM: In the 'ABM Nested Demand' procedure, time-dependent attributes are now also supported in the activity execution factor. **(188382)**

I/O Interfaces

- Export of matrix data to Publisher: The Publisher export has been extended to include relation data, i.e. in particular matrix values (demand and skim matrices). In Visum 2024, data for zone and main zone relations are exported, in Visum 2025 also stop area relations. **(192543)**

Installation

- Update CodeMeter Runtime: The CodeMeter Runtime deployed with PTV Visum has been updated to CodeMeter 8.00. **(208180)**

Network Editor

- Split zones geometrically: The splitting functionality for geometric objects using a separating line that optionally follows the geometries of links can now also be applied to zones. In this case, initial values for the split weights are calculated from the areas of the new zones, but can be manually overwritten. **(162074 | 13465)**

Fixed Bugs

Calculation

- Semi-actuated: A problem was identified on controllers with semi-actuated control. In cases where there is at least one coordinated signal group and one ring without a coordinated signal group, there was an issue with the calculation of the equivalent max green. This could lead to incorrect calculation results later on. One of the effects of this issue was the display of wrong negative values for Clearance Lost Times, especially if phases were set up with very long maximum green times. **(164349 | 23998)**

Data Model

- Calculations with projections too slow: Calculations involving projections (e.g. determination of lengths and surface areas, reprojection of coordinates) were far too slow for certain projections and have been accelerated. **(206321)**

Demand Procedures

- Crash when selecting secondary activities: A crash is no longer occurs when executing the 'ABM Nested Demand' procedure if only the secondary activity executions are calculated and there are tours without a defined main demand segment. **(205954)**
- Error when evaluating the formula for start time in ABM: After editing a person's formula attribute for the start time in the procedure parameters dialog of the procedure 'ABM long-term location choices', error messages sometimes occurred when the procedure was executed later. This error has been fixed. **(206195)**
- Incorrect utility for public transport in ABM: If the same matrix formula was set in the parameters of the 'ABM Nested Demand' procedure for the utility for public transport as for the impedance definition for the shortest path searches, an incorrect utility for public transport was calculated. This error has been fixed. **(205347)**

I/O Interfaces

- Crash when importing GTFS twice: Crashes no longer occur if the GTFS import parameter dialog is opened first, a parameter file is read in, the import is then executed, and this import is then executed again later. **(206570)**
- Direct distance for parts of line routes when importing GTFS: Under certain circumstances, only the direct distance connections were created between two stop points during GTFS import for a line route that actually had a detailed course ('shape'). This error has been fixed. **(206052)**
- Increased memory consumption during GTFS import: The GTFS import used to consume an unnecessarily large amount of memory for large data sets. This memory consumption has been significantly reduced. **(207854)**
- Publisher export did not take the calendar day into account: The export of ABM trajectories to the Visum Publisher did not take the calendar day of the respective activity executions and trips into account. This error has been fixed. **(206708)**
- Slow aggregation when importing GTFS: The aggregation of lines and vehicle journeys in the context of a GTFS import was very slow if the block_id property was indicated in the trips.txt file in the imported GTFS feed because a large number of passenger trip chains were then created depending on the maximum duration set. The default value for the maximum duration has been reduced and the processing of the resulting passenger trip chains has been greatly accelerated. **(205488)**
- Unsorted times rejected during GTFS import: When the entries in the stop_times.txt file were not sorted by time, the import was rejected during the GTFS import. This error has been fixed. **(206385)**

Matrix Editor

- Filtering by matrix values from 0: In the dialog for configuring a filter by matrix values, the value 0 was not accepted as the lower limit. This error has been fixed. **(204160)**

Network Editor

- Crash when aggregating zones: A crash no longer occurs when aggregating zones if a formula matrix is used as the demand matrix for a demand segment. **(209264)**
- Crash when deleting collinear points: Crashes no longer occur when executing the special function 'Delete collinear points' for links if there are links in the network whose From-nodes, To-nodes, and all intermediate points have the same coordinates. **(204690)**

PrT Assignment

- Skim matrices calculation slow: The calculation of PrT skim matrices was slow in networks with certain projections and has been accelerated. **(206296)**

Procedure Sequence

- 'Execute until the marked procedure' calculated to the end of the group: If the 'Execute until the marked procedure' function was used in the procedure sequence and the marked procedure was not the last in its group, the procedure sequence was executed until the end of this group. This error has been fixed. **(204399)**

PuT Assignment

- Negative values for risk due to 'fail to board': When calculating delay risks due to 'fail to board' due to capacity overload, negative risks could be output for paths running beyond the end of the analysis period. This error has been fixed. **(204226)**

PuT Assignment, Visum Files

- Fixed file name extension of con files: If only the file name without an extension (usually '.con') was indicated for PuT connection files, this extension was previously added from the settings for project directories. This setting had the default 'con' but was configurable. Now this set file extension is no longer used, but the extension 'con' is appended regardless of the setting. **(201901)**

Breaking Changes

Assignment PrT

- Cycle length on semi-actuated intersections: The calculated cycle length on semi-actuated intersections now depends on the coordinated flags in the Phasing and Timing sub-table. If there is at least one coordinated signal group, the calculated cycle length depends on the splits and will be identical to the cycle length that was set on the controller, if the data was set up consistently. If there is no coordinated phase, the cycle length will depend on demand. In earlier versions, the cycle length on semi-actuated controllers was always based on the splits, even if there were no coordinated phases. Calculation results on semi-actuated intersections will be different if there are no coordinated phases. **(205739)**

Calculation

- Semi-actuated: Calculation results can be different on semi-actuated controllers with at least one coordinated signal group and at least one ring without coordinated signal group. **(164349 | 23998)**

PuT Assignment, Visum Files

- Fixed file name extension of con files: If only the file name without an extension (usually '.con') was indicated for PuT connection files, this extension was previously added from the settings for project directories. This setting had the default 'con' but was configurable. Now this set file extension is no longer used, but the extension 'con' is appended regardless of the setting. If different file extensions were previously used, this changes the actual file names that are created. **(201901)**

2024.01-02 [270151] 2023-11-15

New Features and Changes

Demand Procedures

- Interpret attributes that do not exist n ABM as 0: In the two procedures 'ABM Nested Demand' and 'ABM Long-Term Location choices', the selected attributes for impedance, travel time and utility on the shortest path had previously to exist for all network object types (i.e. linkss, turns, main turns, etc.). This is no longer necessary. Non-existent attributes are implicitly assumed to have the value 0. **(199035)**

PuT Assignment

- Assignment with fast shortest path search accelerated: The timetable-based assignment using the shortest path search, which was significantly accelerated with Visum 2024 compared to previous versions, has been accelerated again. **(164938 | 25087)**

Fixed Bugs

COM-API

- Crash when autozooming to stop area without access node: A crash no longer occurs when calling the IGraphic::AutoZoom method with an INetElements container that contains a stop, a stop area, or a stop point without an access node. **(198295)**

COM-API, Procedure Sequence

- Switching between procedures and groups: A procedure could not be converted into a group via COM; switching from a group to a procedure either in COM or in the procedure sequence was impossible. In particular, creating a group via COM was impossible because a new procedure step is always a PrT assignment first. This error has been fixed so that it is now always possible to switch between an empty group and a procedure. **(197845)**

Filters, Visum Files

- Filter files for restricted traffic areas are not read: Filter files with settings for restricted traffic areas were only read if they also contained filter settings for locations. This error has been fixed. **(198537)**

Graphical Procedures

- Matrix reference in 'Route projection': In the graphical procedure 'Route Projection', it was not correctly checked if a single data matrix is assigned to the respective demand segment. This error has been fixed. **(201755)**

Lists

- PrT path list crash: A crash no longer occurs in case of an open PrT path list when calculating a PrT assignment based on an existing solution. **(201566)**

Miscellaneous

- Https communication via proxy failed: In some cases, network access via https failed with the message 'Nschannel: next InitializeSecurityContext failed: Unknown error (0x80092012) - The revocation function was unable to check revocation for the certificate', mostly in connection with the use of a proxy. This error has been fixed. **(198743)**

Network Editor

- Crash when aggregating zones according to main zones: A crash no longer occurs when executing the network editor function 'Aggregation of zones according to main zones' if there is a zone that is the only zone allocated to its main zone. **(202393)**
- Incorrect course of a line route: When editing the course of a line route, it was possible to create routes that turn around at a link stop point, i.e. reach this point on a link and then use the reverse link. Such route courses are not permitted and were rejected when the changes are applied. They can now no longer created in the ntework editor. **(164624 | 24693)**

PuT Assignment

- Incorrect restriction of zone relations: In the timetable-based assignment using the shortest path search, restrictions on zone relations only applied if there was a zone in the network with the specified from-zone number and one with the to-zone number. This error has been fixed. **(200661)**
- Lower limit for ignored paths in headway-based assignment: The lower limit for the share of ignored paths in the headway-based assignment has been significantly reduced so that more paths can optionally be retained. **(203847)**
- The fast shortest path search does not find some shortest paths: The timetable-based assignment with the fast shortest path search did not find certain connections. This was the case if in the course of a time profile only boarding or only alighting was permitted for several successive stop points. This error has been fixed. **(200320)**

Visum Files

- Reading version files from a network drive was too slow: Reading version files containing large amounts of matrix data from a network drive was too slow and has been accelerated. **(201921)**

2024.01-01 [269129] 2023-10-24

New Features and Changes

Demand Procedures

- Output of access and egress stop areas for ABM Nested Demand: In the 'ABM Nested Demand' procedure, the numbers of the access and egress stop areas are optionally output for trips made by public transport, i.e., those stop areas where the transfer from initial or final walk path to transportation takes place. **(182114)**

Formulas, Demand Procedures

- Placeholders for transport system: In attribute-valued formulas, placeholders for subattributes of type transport system or pairs of placeholders for transport system and analysis time interval can now be used. **(183324)**

Fixed Bugs

COM-API

- Execution of internal scripts sporadically failed: The execution of internal Python scripts (i.e. those executed from within Visum, either via a procedure step or via the menu item 'Run script') sporadically failed. This bug has been fixed. **(158763)**

Data Model

- Discarding assignment results in case of renaming: If network objects relevant for public transport such as transport systems, lines, line routes, and time profiles were renamed in such a way that the sort order changes, existing PuT paths could no longer be interpreted correctly. However, they were not discarded. This error has been fixed in that PuT assignment results are now always discarded when renaming underlying network objects. **(192315)**
- Invalid characters in attributes of user-defined tables: User-defined tables with an invalid name, group, and comment containing the characters ';' and '$', which are used as separators in the network file, could be created both via the dialog and COM. Network files with such data could therefore not be read. This error has been fixed. When importing version files, the affected characters are replaced by underscores. **(190046)**

Demand Procedures

- Crash in ABM for locations without zone allocation: No more crash when running the 'ABM Nested Demand' procedure if there are locations in the network without a zone allocation and no zone utility is used in the procedure parameters in any of the utility definitions. **(198539)**
- Crash on ABM tours with only one trip: If a tour consisted of only exactly one trip that had only either a From- or a To-activity execution, and that one activity execution was a home activity execution, Visum crashed when executing the 'ABM Nested Demand' procedure. This error has been fixed. Such tours are now understood as Home> Home tour and ignored. **(198504)**
- Home activity as main activity of a tour in ABM: In the procedure 'ABM Nested Demand', a home activity execution could be selected as the main activity execution of a tour (lowest rank). This bug has been fixed. **(195185)**
- Restricted traffic area in ABM: Visum does not crash anymore when using an attribute of a restricted traffic area in the shortest path utility function in the 'ABM Nested Demand' procedure. **(195135)**

Graphical Procedures

- Maximum access time for isochrones: When calculating isochrones, the maximum transfer time applied to the walk link when accessing or egressing, not the maximum time for access and egress. This error has been fixed. **(194203)**

I/O Interfaces

- Blocking messages during Synchro import: Invalid characters in input files caused interrupting error messages during Synchro import. Now further messages can be optionally suppressed during the import process. **(164475 | 24390)**
- Spatial filter in Publisher export: When exporting ABM trajectories to Visum Publisher, the spatial selection did not work correctly. This bug has been fixed. **(187071)**
- Vistro update import improved: The import of Vistro update files has been improved in several ways. In particular, the import now succeeds even if several nodes share the same signal controller. **(171800)**

Network Editor

- Crash when splitting a link: Crashes no longer occur if you cancel the 'Split link according to length' operation right at the beginning. **(196467)**
- No warnings when splitting a link: No warnings were issued when splitting links in the network editor (e.g. the deletion of assignment results). This bug has been fixed. **(196498)**

PrT Assignment

- Priority not considered at roundabouts in SBA: In certain constellations, vehicles did not respect the priority rules at multi-lane roundabouts in the simulation-based dynamic assignment (SBA). This bug has been fixed. **(191825)**
- Volumes missing in case of incremental assignment of several demand segments: If multiple demand segments with the same transport system were assigned using incremental assignment, the total volumes of the network objects were shown in one of the demand segments, and the volumes of the other demand segments were 0. This error has been fixed. **(197117)**

PuT Assignment

- Delay analysis for hybrid supply: As part of the delay analysis, the delayed arrival times of paths that use both headway-based and timetable-based supply were not calculated correctly. This error has been fixed. **(191916)**
- Discarding assignment results in case of renaming: If network objects relevant for public transport such as transport systems, lines, line routes, and time profiles were renamed in such a way that the sort order changes, existing PuT paths could no longer be interpreted correctly. However, they were not discarded. This error has been fixed in that PuT assignment results are now always discarded when renaming underlying network objects. **(192315)**
- Error in shortest path search with special transition times: In the timetable-based assignment with shortest path search, special transfer walk times were not correctly taken into account. On the one hand, this led to suboptimal paths, but could also cause the runtime of the procedure to increase unnecessarily. This error has been fixed. **(192045)**
- Too long walk links with 'Optimal Strategies': In the headway-based assignment, when using the computation time-optimized algorithm for no passenger information ('Optimal Strategies'), in some cases walk links were generated that were longer than the maximum allowed walk time. This bug has been fixed. **(194479)**

Schematic Line Diagram

- Crash in graphic parameters dialog: No more crashes when editing the graphic parameters of edge gradients in a schematic line diagram under certain circumstances. **(190444)**
- Graphic parameters for passenger trip chains: The settings for the display of passenger trip chains defined in the graphic parameters dialog of the schematic line diagram did not take effect, i.e. the default display was always used. This bug has been fixed. **(191569)**

Subnetwork Generator

- Error when cutting line routes: When the subnetwork generator was run with one of the options that resulted in cutting off line routes, vehicle journeys crossing the interface may not have been handled correctly, causing the subnetwork generator to abort. This error has been fixed. **(195730)**

2024.01-00 [267602] 2023-09-21

New Features and Changes

COM-API

- Access to comparison patterns: Comparison patterns are now available through the COM interface as part of scenario management. **(162331 | 14842)**

Data Model

- Volume seat capacity ratio and volume total capacity ratio at vehicle journey items: The two indicators 'Volume seat capacity' and 'Volume total capacity ratio' are now also provided as attributes at vehicle journey items. **(163806 | 21955)**

Data Model, Filters

- Type of transport system specification of a PuT path leg: The data type of the specification of the transport system at a PuT path leg has been changed from string to transport system. As a result, the usual operators and input help for transport systems can be used in the dialog of the PuT path filter. **(181681)**

Demand Procedures

- Activity-based models: The new procedure 'ABM Nested Demand' is a procedure to calculate disaggregated demand. It can be described as a spatially and temporally disaggregated 4-step,
tour-based or Nested Demand model. The result of a demand calculation is a detailed individual daily schedule per person. **(181669)**
- Activity-based models: The new procedure 'ABM long-term location choices' is part of the ABM model type fully integrated in Visum for the calculation of disaggregated demand. It determines individual destinations for recurring mandatory activities such as work or school in analogy to the procedure 'ABM Nested Demand'. **(167550)**

Formulas

- A new function 'Color(a, r, g, b)' has been introduced to determine the color value from separate values for alpha, red, green, and blue. The separate values are expected to be integers in the range from 0 to 255. **(168018)**
- Exception values changed: Several exception values have been changed in matrix formulas. These are values that, by definition, are considered the result of a calculation that cannot be performed mathematically correctly. In particular, 0/0 = 1 now applies, positive number / 0 results in a very large positive value, negative number / 0 results in a very large negative value, and ln(0) also results in a very large negative value. **(164728 | 24893)**

Lists

- New list for direct connections: A new list (under PuT Supply > Lines) shows all direct connections between selected stop areas. Connections on coupled vehicle journeys are identified, and passenger trip chains and circle line transitions lead to direct connections that extend beyond the stops on a vehicle journey. **(164470 | 24367)**

Matrix Editor

- Exception values changed: Several exception values have been changed in matrix formulas. These are values that, by definition, are considered the result of a calculation that cannot be performed mathematically correctly. In particular, 0/0 = 1 now applies, positive number / 0 results in a very large positive value, negative number / 0 results in a very large negative value, and ln(0) also results in a very large negative value. **(164728 | 24893)**

Other Procedures

- Calculate split factors for splitting matrices: The new procedure Calculate split factors allows the transformation of demand matrices based on a zone system other than the current one. Optionally, building layers can be used for weighting. **(164271 | 23738)**
- Splitting matrices: The matrix operation 'Split' allows to read split factors from a user defined table. The result can optionally be written to a new external matrix as well as to an existing internal matrix. **(164794 | 24964)**

Procedure Sequence

- Warning for unauthorized Go To operations: Go To operations are not allowed from or into groups that themselves contain a condition. A message now draws attention to such constellations. **(183143)**

PuT Assignment

- Search impedance of PuT paths: The search impedance can optionally be stored for each path when using the branch & bound procedure in the timetable-based assignment. **(164241 | 23651)**

Safety

- Replacement of database: Visum Safety now uses a SQLite database instead of a MS SQL Compact Edition database for saving data. **(170249)**

Visum Files

- Reading and writing of user-defined attributes accelerated: Reading and writing the values of user-defined attributes has been accelerated. **(163097 | 18696)**

Fixed Bugs

Add-Ins

- Demand Calibration did not calibrate: If the code of the calibration level (person groups or activities) contained several underscores, nothing was calibrated. This bug has been fixed. **(193296)**
- Demand Calibration did not calibrate: When executing the add-in 'Demand Calibration' with mode choice as the procedure to be calibrated, 'Modal Split' as the calibration object, and demand stratum as calibration level, nothing was calibrated. This error has been fixed. **(190948)**
- Error in case of key attributes in PuT in TransCAD import: If a shapefile selected in the add-in 'Import TransCAD Network' for PuT objects contained the key attributes as 32-bit integers, the import failed with an error message (see also ID 189219 for links and connectors). This error has been fixed. **(192365)**
- Error with key attributes in TransCAD import: If a shapefile selected in the 'Import TransCAD Network' add-in for links and connectors contained the attributes selected there for link number, from-node number or to-node number as 32-bit integers, the import failed with an error message. This error has been fixed. **(189219)**

Dialogs

- Display of weights for connectors incorrect: After switching between different connectors via the buttons in the connector dialog, the values of the connector weights were sometimes displayed incorrectly. This has been fixed. **(164604 | 24655)**
- Headway-based supply in timetable-based assignment: In the parameter dialog of the timetable-based assignment, the setting 'Consider only active time profiles' for the headway-based supply could be lost in case of certain operation sequences. This error has been fixed. **(164602 | 24652)**
- Preselection in attribute selection incorrect: When entering the attribute selection dialog from list-like tables, the first attribute was always selected instead of the preselected attribute when sorting systematically. This bug has been fixed. **(179502)**

Filters

- Cross-section values in lists in combination with directed filter: If the display of cross-section values was activated in a list, the object of the direction 'Up' with the cross-section values was previously displayed for each pair. If a filter was set at the same time, which inactivated the object of the direction 'Up', but activated the one of the direction ‘Down’, there was no representative for this pair in the list anymore. Now, in this particular case, the object of the direction 'Down' is displayed with the cross-section values. For all attributes with cross-section logic it doesn't matter, but the key attributes (e.g., for links From-node-number and To-node-number) are then swapped. Note: The filter is still effective on the individual network object themselves, not on pairs and their cross-section values! **(174816)**

Graphical Procedures

- Temporal restriction of flow bundle did not work for sharing paths: For pure sharing paths, i.e. PuT paths that contain only path legs of type Sharing or PuT Walk, temporal restrictions of the flow bundle did not work, i.e. paths were contained in the flow bundle that crossed the flow bundle object outside the set time window. This bug has been fixed. **(191693)**

Graphics

- Background color of the network editor not completely white: If a pure white (RGB 255 / 255 / 255) was set as the background color for the network editor, the color was changed to a slightly bluish shade after saving a version or graphic parameters file and then re-loading this file. This error has been fixed. **(163948 | 22699)**

I/O Interfaces

- Duplicated block items while importing from railML 'only line blocks': During import 'only line blocks' from railML files, duplicated block items occurred if a vehicle journey section was split into several parts during the previously performed railML export and these parts were scheduled consecutively in one line block. This error has been fixed. **(175078)**
- Invalid line routes after GTFS import: During the GTFS import, line routes occurred that consisted of only a single stop point that was both the start and end point, as well as vehicle journey sections where boarding or departing was prohibited at the start or end stop point. These cases are now rejected with a message. **(188662)**
- One-way streets in OSM import: When importing one-way streets from OpenStreetMap (OSM), opposite directions that were closed but open to pedestrians were allocated the same number of lanes as the open main direction. This error has been fixed by now allocating 0 lanes to these links. **(191917)**

Installation

- Crash during program start due to user-defined VD functions: No more crash at program start if there are invalid DLLs in the directory for user-defined VD functions. **(189761)**
- No procedure sequences in older Windows versions: In Windows versions from release 1903 (i.e., older versions of Windows 10, Windows Server 2019, and earlier), no procedure parameter files could be imported. When a version file was loaded, the procedure sequence it contained was not imported. This error has been fixed. **(188582)**

Lists

- Crash when activating column filters in PuT path leg list: A crash no longer occurs when selecting a column filter in the PuT path leg list. **(179606)**

- Cross-section values in lists in combination with directed filter: If the display of cross-section values was activated in a list, the object of the direction 'Up' with the cross-section values was previously displayed for each pair. If a filter was set at the same time, which inactivated the object of the direction 'Up', but activated the one of the direction ‘Down’, there was no representative for this pair in the list anymore. Now, in this particular case, the object of the direction 'Down' is displayed with the cross-section values. For all attributes with cross-section logic it doesn't matter, but the key attributes (e.g., for links From-node-number and To-node-number) are then swapped. Note: The filter is still effective on the individual network object themselves, not on pairs and their cross-section values! **(174816)**
- PuT path filter did not work on PuT OD pairs: In the list PuT OD pairs, when the 'Filter for OD pairs' and the filter 'Flow bundle routes' were set, only the filter for OD pairs (and additionally the flow bundle condition) worked, but not the PuT path filter belonging to the filter for OD pairs. This bug has been fixed. **(190593)**
- Shortcut menu entries for RBC signal controllers: The shortcut menu entries in the Signal controllers list for the various editing functions are now the same for Vissig and RBC controls. **(164676 | 24820)**

Matrix Editor

- Crash in the dialogs for splitting and aggregating: The program no longer crashes when trying to edit the only table entry in the parameter dialog for splitting or aggregating external matrices. **(194047)**

Network Editor

- Z-coordinates not interpolated for the desired links: If the network editor special function for interpolating z-coordinates was executed for active links, the coordinates of all links were interpolated. However, if it was run for all links, not just the active ones, and there was no active link, no link was interpolated at all. Both bugs have been fixed. **(190464)**

PrT Assignment

- Factors for vehicle lengths and reaction times at roundabouts swapped: The factors for vehicle lengths and reaction times in the simulation-based dynamic assignment (SBA) were swapped at roundabouts. This error has been fixed. **(189335)**
- Incorrect gap acceptance: Within the simulation-based dynamic assignment (SBA), conflicts at two-way nodes were incorrectly resolved in certain cases when the vehicles involved had different reaction times. This error has been fixed. **(189517)**

PuT Assignment

- Crash when exporting connections with sharing paths: Crashes no longer occur when executing the timetable-based assignment if a connection file with fares is exported and sharing transport systems are taken into account. **(191599)**
- PuT path filter did not work on PuT OD pairs: In the list PuT OD pairs, when the 'Filter for OD pairs' and the filter 'Flow bundle routes' were set, only the filter for OD pairs (and additionally the flow bundle condition) worked, but not the PuT path filter belonging to the filter for OD pairs. This bug has been fixed. **(190593)**
- Wrong values of skim 'Path leg attribute': The skim 'path leg attribute' provides access to any attribute of a path leg, but walk legs have been omitted, and the attribute 'path leg index' did not return correct values. Both errors have been fixed. **(185332)**

Subnetwork Generator

- Termination in case of POI category with user-defined attributes: The subnetwork generator will no longer be terminated if there is at least one POI category with at least one user-defined attribute in the network. **(187674)**
- Termination in certain constellations: In certain constellations, where both stops at the edge of the subnetwork and PrT assignment results were transferred to the subnetwork, the subnetwork generation would abort. This bug has been fixed. **(189696)**

Visum Files

- Crash while restoring the window configuration: In rare cases, a crash can occur when importing a version file with restoration of the tool window configuration (user setting). This error has been fixed. **(180132)**

Breaking Changes

Data Model, Filters

- Type of transport system specification of a PuT path leg: The data type of the specification of the transport system at a PuT path leg has been changed from string to transport system. As a result, the usual operators and input help for transport systems can be used in the dialog of the PuT path filter. Existing filter files will be adapted as far as possible during import, but should be checked if they contain a PuT path filter. **(181681)**

Formulas

- Exception values changed: Several exception values have been changed in matrix formulas. These are values that, by definition, are considered the result of a calculation that cannot be performed mathematically correctly. In particular, 0/0 = 1 now applies, positive number / 0 results in a very large positive value, negative number / 0 results in a very large negative value, and ln(0) also results in a very large negative value. This changes calculation results in formulas as well as in various procedures, especially demand procedures. **(164728 | 24893)**

Matrix Editor

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PrT Assignment

- Incorrect gap acceptance: Within the simulation-based dynamic assignment (SBA), conflicts at two-way nodes were incorrectly resolved in certain cases if the vehicles involved had different reaction times. This error has been fixed. As a result, the assignment results of simulation-based dynamic assignment change in almost all networks. **(189517)**

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New Features and Changes

COM-API

- MapMatcher optionally considers main nodes: MapMatcher now optionally considers also main nodes, i.e. with the shortest path search between the candidate positions in the target network, the inner nodes and links of a main node are not considered. They are replaced by the main turn connecting the cordon links. It should be noted that the inner nodes and links are also not considered in the candidate search, so in principle input points that fall within the area of a main node cannot be placed well. **(174715)**
- PuT isochrones with own parameters for the search of walk links: The parameter object 'IPuTIsochroneBasePara' has its own explicit parameters for describing the allowed walk links, i.e. for maximum walk times and for searching walk links within stops as well as from connector to connector. When calling the method 'IIsochrones.ExecutePuTWithParameterObjects()' these act instead of the general procedure parameters used so far. The parameter-free method 'IIsochrones.ExecutePuT()', on the other hand, uses the set general procedure parameters of the network as before. **(165566 | 24261)**
- Remove deprecated methods: Methods and objects that have been deprecated for at least two years have been removed. This includes IVisum.Lists (replace by IVisum.Workbench.Lists), IVisum.LoadNet (replace by IVisum.IO.LoadNet) and IVisum.SaveNet (replace by IVisum.IO.SaveNet). **(164531 | 24528)**
- Reset Python import path (sys.path) before script execution: The Python import path is now set to the following paths before each script execution: the paths defined by the user (if any), the Add-in paths, the paths specified by Python. **(164956 | 25103)**
- Uniform spelling of argument identifiers: The spelling of argument identifiers in function calls has been unified so that the same identifier that appears as an argument in different methods in the IDL has the same upper/lower case. This prevents errors from occurring during execution, because otherwise arguments with the same name occur in a Python script in different notations. If a script uses keyword arguments, the spelling in the script must be adapted to the changed spelling in the IDL. Position arguments are not affected. **(164592 | 24628)**

Cloud

- Opening calculation results from the MRU list: When opening a cloud model from the MRU list that has a corresponding calculation result, there is now an option to also open the calculation result. **(183172)**

Data Model

- Connector types: The restriction to typ numbers 1 to 10 for connector types has been removed. All non-negativ integers are allowed. **(155162 | 24372)**
- Link attribute 'Slope': The link attribute 'Slope' has been reduced by a factor of 100. As a result, it is displayed correctly in percentage format in the list. This format is now also the default. Calculations that use the slope or the special function to set this attribute have been adjusted accordingly. Calculated results will not be modified because of these changes. **(164584 | 24617)**
- Relations from network: The following 1:n relations from network have been added: holidays, information signs, time series, and demand time series. **(155328 | 24683)**
- Relations in fare model: Relations between ticket types and fare supplements-, from-to-zone fare, and short fare items, as well as other relations, have been added. **(164640 | 24736)**
- Renaming of 'Matrix' attributes: Attributes named 'Matrix' (or extensions thereof, such as 'Distribution matrix') whose type is a matrix reference have been renamed to 'MatrixRef' (or corresponding extension). This affects the network objects demand description and time series item as well as the following procedure parameters: ActivitySimExportPara, DemandMatrixCorrectionResultPara, DemandMatrixCorrectionSkimDistributionPara, EstimateGravityParametersOutputPara, EVAModeDStratModeChoicePara, JumpBackPara, LinCombParaItem, MatrixProjectionOperationPara, ModeChoiceDStratModePara, ModeChoiceDStratPara, ModeChoiceLinCombItem, ModeChoiceModeDStratPara, NestedDemandDemandMatrixPara, NestedDemandDemandStratumPara, ParkAndRideLotChoiceDStratPara, ParkAndRideLegSplitPathSeqSetPara, TBFreightDistributionDStratPara, TBFreightTourGenerationDStratPara, TBFreightTourGenerationOutputItem, TripDistributionDStratPara, TripDistributionLinCombPara, VisemDGroupActivityDistributionPara, VisemDGroupActivityTreeNodeNestedModeChoicePara, VisemOutputItem. COM access using the previous name is still guaranteed for a certain time. **(154414 | 23226)**

Demand Procedures

- ABM and import of synthetic populations including their schedules: The previous importer for PopulationSim has been extended and renamed accordingly to Synthetic Population Data. Now, in addition to a synthetic population generated by PopulationSim, associated surveyed schedules can also be imported. For this, the daily plans only have to be available in the form of a simple trip diary. **(164687 | 24838)**
- ABM: The new fully integrated procedure ABM Nested Demand is a procedure to calculate disaggregated demand. It can be described as a spatially and temporally disaggregated 4-step, Visem or Nested Demand model. It includes the destination and mode choice steps and is based on the same nested logit model as aggregate models. **(167545)**
- EVA-Trip generation with subspace balancing: In the procedure EVA trip generation an optional balancing of production and attraction target values can be performed on the basis of the definition of subspaces. The normalization of production and attraction, respectively, is done for sides of an activity pair which is not Home activity. It is also done if the constraint for balancing is defined as 'hard'. **(161639 | 9796)**
- Standardized assessment: The specific mode choice procedure for an outdated version of the Standardized assessment has been removed from the program. The function set for the current standardized evaluation remains unaffected. **(164533 | 24530)**
- Tour-based freight trip generation: The progress display of the procedure Tour-based freight trip generation has been improved. **(155341 | 24706)**

Dialogs

- Centroids of surfaces: The function 'Recalculate centroids' for objects with surfaces has been renamed into 'Move coordinates to geometric centroids'. **(164724 | 24888)**
- Copy & paste of attributes: In the attribute selection dialogs there is a possibility to copy attributes to the clipboard via the context menu. The attributes can be pasted via the context menu, e.g. in the attribute selection dialog on the side of selected attributes or in the search field for attributes in dialogs. **(164486 | 24412)**
- Marking of key attributes: In the attribute selection dialog key attributes are marked by a trailing symbol of a key. **(164484 | 24410)**
- Network check: The network check 'Multiple straight turns and main turns has been moved from the section 'General' to 'PrT'. **(164903 | 25060)**
- New control: A new control for managing list layouts has been added. This control makes it easier to add new files, delete or rename existing files. **(164464 | 24357)**

Formulas

- Behavior of arithmetic operations: The settings for the behavior of arithmetic operations in the user preferences have been removed. The default values have been implemented. **(164447 | 24298)**
- New function for matrix formula: There is a new matrix formula called 'DIRECTDISTANCE()' that calculates the direct distances between origins and destinations of a matrix. **(163779 | 21805)**

- Syntax change of some functions: The syntax of the following functions was renamed to improve readability of formulas: 'IDIV' to 'DIV', 'STRTONUM' to 'TEXTTONUM' and 'NUMTOSTR' to 'NUMTOTEXT'. For backwards compatibility, all existing formulas stay valid and will automatically be redirected to the renamed functions when the formula is evaluated. **(155373 | 24787)**

Graphics

- Layers in Inkscape-optimized SVG export: The Inkscape-optimized SVG export of a graphical view adds meta information so that various network objects are represented by Inkscape as named layers. **(163769 | 21742)**
- Updated library for coordinate transformations: The library used for coordinate transformations has been updated. **(185280)**

I/O Interfaces

- .csv export from lists: A new export option has been implemented that writes files in .csv format. The export follows fixed conventions without any options for settings. **(163211 | 19159)**
- Changed shapefile export to UTF-8: The shapefile export, which was previously exported as ANSI depending on the code page currently selected in the system, is now exported as UTF-8. **(155241 | 24487)**
- Error messages during GTFS import: The GTFS import procedure now provides error messages with hints to the concrete reason for failure. **(180485)**
- Excel-Export: The content of lists can be exported to a spreadsheet program. **(163857 | 22196)**
- Import of Vistro update data: A new interface for the import of Vistro update data has been implemented. The import is based on geographic information. It is mainly intended to update junction data (geometry and control) in Visum models. **(164654 | 24780)**
- Import of elevation data: Visum imports elevation data from locally stored GeoTIFF files. The z-coordinate of the (active) nodes and intermediate link points are set and all link attributes based on them are recalculated. **(164120 | 23292)**
- Only vehicle code as identifier during railML import: During railML import, the comparison between imported vehicle combinations and vehicle units already existing in the network can now optionally be restricted to the attribute Code, i.e. if there is already a vehicle unit or a vehicle combination in the target network with the same code as specified in the railML file, it will be used instead of creating a new object. **(171016)**

Installation

- Update of Python and python libraries: The private Python of the Software has been updated to version 3.11. At the same time several libraries have been updated too. **(172205)**

Junction Editor

- Geometry improvements: The geometry of displayed roundabouts has been further improved, especially regarding to crosswalks and bypasses. **(164593 | 24634)**
- Improved display of roundabouts: The display of roundabouts in the junction editor has been further improved. **(164598 | 24641)**

Line Blocking

- Minor improvements: Line blocking with vehicle interchange as well as that with obligatory recurring actions has been improved and slightly accelerated. **(164785 | 24955)**

Lists

- Excel-Export: The content of lists can be exported to a spreadsheet program. **(163857 | 22196)**
- New control: A new control for managing list layouts has been added. This control makes it easier to add new files, delete or rename existing files. **(164464 | 24357)**

Matrix Estimation

- Least squares as default Variant: When adding a procedure Demand matrix correction by default Least squares is selected as variant. **(180472)**
- default weight for the Least Squares variant: In addition to the count values, the user previously had to define associated weights. This is no longer necessary: the user can select the default weight, which leads to a balance between count values of different magnitudes. **(164046 | 23084)**

Miscellaneous

- Update of MKL: The MKL (Math Kernel Library) has been updated from Version 2020 to Version 2023.1. This supports newer processors and optimizes performance. **(180352)**

Network Comparisons

- Short and long names of attributes for comparisons of scenarios: The readability of attributes when applying comparison patterns under Scenario Management has been improved. For corresponding comparison attributes, by default the codes of the scenarios are now used as part of the attribute name.
  For comparisons of networks as well as version comparisons, 'This network' is used for the currently loaded version and the code or version name for the comparison network. **(164415 | 24221)**

Network Editor

- Interactive setting of the elevation of intermediate link points is possible. **(163979 | 22824)**
- Split territories geometrically: For territories, a new network editor function 'Split geometrically' has been added which splits existing territories by an interactively defined line. **(164459 | 24341)**

Other Procedures

- EWS: The outdated procedure of the economic efficiency analysis according to EWS-97 has been removed. **(164320 | 23902)**
- Intersect objects with surfaces as point objects: The operation 'Intersect' has an additional option that allows to intersect objects with surfaces (e.g. zones) as point objects (e.g. considering the zone centroids) **(162661 | 16787)**
- Intersect using a negative buffer size: The Intersect procedure allows for objects with surfaces negative values for the buffer size. The intersect procedure is then executed with the polygon reduced by te buffer size if the size still has a positive value. **(164030 | 23026)**
- Intersect: The memory consumption of the intersect operation, especially with complexe objects with surfaces, has been reduced. **(163945 | 22690)**
- Parameters for the signal cycle and split optimization: The parameters 'Use cycle times of coordination groups' and 'Precision of computation' in the General procedure settings have been removed. For signal controllers that are allocated to a coordination group the cycle times of the coordination groups are used, otherwise the signal controller attributes 'ICA minimum cycle time for optimization' and 'ICA maximum cycle time for optimization' are taken into account. Regarding precision of computation, for Vissig the controller frequency determines precision, and for RBC 1s is used. **(164995 | 24786)**
- Procedure parameters intersect: The parameters 'Round', 'Separator' and 'Max. text length' in the procedure Intersect have been removed. Instead of optional rounding, rounding is always used. For the 'Separator' and 'Max. text length' the values defined in the network settings are used. **(164734 | 24901)**

PrT Assignment

- Blocking back (fair) faster: The calculation of the blocking back model in the fair variant has been accelerated. **(164024 | 23008)**
- List PrT assignment quality data: In these lists attributes of impedances are shown without units. **(167193)**
- Logging of non-converged objects: The option 'Protocol of non-converged objects' in the General procedure settings has been removed and therefore also the listing of these objects in the file 'Protocol.txt'. **(164991 | 22999)**
- Removal of the Equilibrium Lohse method: The PrT assignment method Equilibrium Lohse has been removed including its COM objects and methods. When reading version files, in which this method is used in the procedure sequence, it will be replaced by the method Equilibrium assignment Bi-conjugate Frank-Wolfe. **(163863 | 22223)**
- Speed up of the stochastic assignment: The stochastic assignment has been accelerated significantly. **(164788 | 24958)**

Procedure Sequence

- Conditional execution of procedures: The execution of procedures and groups of procedures, respectively, can be linked to a condition which is defined as formula in the column 'Condition'. The current value of the condition is shown in an additional column of the procedure sequence. **(162429 | 15506)**

Prt Assignment

- ICA calculation in PrT assignments: The ICA calculations can only be executed in combination with the following PrT assignment methods: Assignment with ICA, equilibrium assignment Bi-conjugate Frank-Wolfe (BFW) if the option 'Impedances at ICA nodes' is activ, and in the macroscopically modeled part in the meso-macro simulation within the simulation-based assignment (SBA). **(164087 | 23224)**

PuT Assignment

- Limitation of maximum walking times: The limitation of maximum walking times is now differentiated according to path legs during access and egress as well as path legs during transfers between two stops. **(164217 | 23575)**

- Restriction of demand data in the timetable-based assignment: The previous option to restrict demand data in the timetable-based assignment to a range of origin zone numbers has been changed. The selected range of zone numbers now applies to origin and destination zones. **(164808 | 24982)**
- Shortest path search: The shortest-path search within the timetable-based assignment has been massively accelerated. It now offers a fast alternative to the Branch & Bound search, especially for the calculation of skims. **(164603 | 24654)**

Scenario Management

- Reading many modifications: Reading of many small modifications has been accelerated. **(164498 | 24451)**

Scenario Managment

- Short and long names of attributes for comparisons of scenarios: The readability of attributes when applying comparison patterns under Scenario Management has been improved. For corresponding comparison attributes, by default the codes of the scenarios are now used as part of the attribute name.
  For comparisons of networks as well as version comparisons, 'This network' is used for the currently loaded version and the code or version name for the comparison network. **(164415 | 24221)**

Schematic Line Diagram

- Intermediate Stops: Stops between transfer nodes can now be displayed in a simplified way in the schematic line diagram. Here you can choose between the standard display, which aggregates the intermediate stops and depicts the number, or displays all intermediate. **(164421 | 24243)**

Timetable Editor

- Chained-up vehicle journey sections: The tabular timetable now displays classifiable symbols for incoming and outgoing ends of chained-up vehicle journey sections. **(164516 | 24501)**

Visum Files

- Format of timestamp: The format of the timestamp logged in the files 'Protocol.txt' and 'Messages.txt' has been unified to ISO 8601 format (i.e. yyyy-mm-dd hh:mm:ss.MMM). **(164834 | 25010)**
- Logging of non-converged objects: The option 'Protocol of non-converged objects' in the General procedure settings has been removed and therefore also the listing of these objects in the file 'Protocol.txt'. **(164991 | 22999)**
- Text-based file exports in English: Text-based Visum files (i.e. network files, attribute files, demand files, model transfer files, interval files and multi-line survey data) can be saved in English only. The user setting to switch to localized exports has been removed as well as the COM access for this setting. **(164774 | 24944)**

Breaking Changes

Data Model

- Link attribute 'Slope': The link attribute 'Slope' has been reduced by a factor of 100. As a result, it is displayed correctly in percentage format in the list. This format is now also the default.
  Calculations that use the slope or the special function to set this attribute have been adjusted accordingly. Calculated results will not be modified because of these changes.
  Users, who have already used an elevation definition that is smaller by a factor of 100 in the 'Slope' attribute due to the display problem must adjust their data. If they have used the slope data in their own impedance or consumption definitions, calculation results based on this will change with PTV Visum 24. **(164584 | 24617)**
- RBC controller with coordination 'Free running: The Lead / Lag flag was wrongly taken into account on free running RBC controllers. This error has been fixed. Therefore, the resulting sequences change for free running controllers. **(164737 | 24906)**

Matrix Estimation

- Least squares as default Variant: When adding a procedure Demand matrix correction by default Least squares is selected as variant. This changes the behavior of scripts that only create a new procedure demand matrix correction. **(180472)**

PuT Assignment

- Restriction of demand data in the timetable-based assignment: The previous option to restrict demand data in the timetable-based assignment to a range of origin zone numbers has been changed. The selected range of zone numbers now applies to origin and destination zones. If this option was used in Visum 2023 or older release versions the option 'OD pairs considered for assignment' in combination with a corresponding filter must be used instead. **(164808 | 24982)**
- Shortest path search: The shortest-path search within the timetable-based assignment has been massively accelerated. It now offers a fast alternative to the Branch & Bound search, especially for the calculation of skims. It's now based on a connection scan algorithm. Thus, the search is different and the assignment results obtained change accordingly. **(164603 | 24654)**

Visum Files

- Format of timestamp: The format of the timestamp logged in the files 'Protocol.txt' and 'Messages.txt' has been unified to ISO 8601 format (i.e. yyyy-mm-dd hh:mm:ss.MMM). Scripts using this information must be adjusted. **(164834 | 25010)**
- Text-based file exports in English: Text-based Visum files (i.e. network files, attribute files, demand files, model transfer files, interval files and multi-line survey data) can be saved in English only. The user setting to switch to localized exports has been removed as well as the COM access for this setting. Scripts must be adopted accordingly. **(164774 | 24944)**

COM-API

- GTFS Import/Export: The GTFS import/export has been adapted to the specification for GTFS (https://gtfs.org/), in particular a .zip file must be specified as the source for the import and a file name of a .zip archive must be specified when exporting. Other requirements listed in the specification are checked and reported accordingly. Older parameter files (*.puti) must be adjusted or lead to corresponding error messages. **(164679 | 24824)**
- PuT isochrones with own parameters for the search of walk links: The parameter object 'IPuTIsochroneBasePara' has its own explicit parameters for describing the allowed walk links, i.e. for maximum walk times and for searching walk links within stops as well as from connector to connector. When calling the method 'IIsochrones.ExecutePuTWithParameterObjects()' these act instead of the general procedure parameters used so far. The parameter-free method 'IIsochrones.ExecutePuT()', on the other hand, uses the set general procedure parameters of the network as before. **(165566 | 24261)**
- Reset Python import path (sys.path) before script execution: The Python import path is now set to the following paths before each script execution: the paths defined by the user (if any), the Add-in paths, the paths specified by Python. Because resetting the Python import path was not done consistently so far, the behavior may change in models where the Python import path has been manipulated. **(164956 | 25103)**
- Uniform spelling of argument identifiers: The spelling of argument identifiers in function calls has been unified so that the same identifier that appears as an argument in different methods in the IDL has the same upper/lower case. This prevents errors from occurring during execution, because otherwise arguments with the same name occur in a Python script in different notations. If a script uses keyword arguments, the spelling in the script must be adapted to the changed spelling in the IDL. Position arguments are not affected. **(164592 | 24628)**

Data Model

- Renaming of 'Matrix' attributes: Attributes named 'Matrix' (or extensions thereof, such as 'Distribution matrix') whose type is a matrix reference have been renamed to 'MatrixRef' (or corresponding extension). This affects the network objects demand description and time series item as well as the following procedure parameters: ActivitySimExportPara, DemandMatrixCorrectionResultPara, DemandMatrixCorrectionSkimDistributionPara, EstimateGravityParametersOutputPara, EVAModeDStratModeChoicePara, JumpBackPara, LinCombParaItem, MatrixProjectionOperationPara, ModeChoiceDStratModePara, ModeChoiceDStratPara, ModeChoiceLinCombItem, ModeChoiceModeDStratPara, NestedDemandDemandMatrixPara, NestedDemandDemandStratumPara, ParkAndRideLotChoiceDStratPara, ParkAndRideLegSplitPathSeqSetPara, TBFreightDistributionDStratPara, TBFreightTourGenerationDStratPara, TBFreightTourGenerationOutputItem, TripDistributionDStratPara, TripDistributionLinCombPara, VisemDGroupActivityDistributionPara, VisemDGroupActivityTreeNodeNestedModeChoicePara, VisemOutputItem. COM access using the previous name is still guaranteed for a certain time. **(154414 | 23226)**

Formulas

- Behavior of arithmetic operations: The settings for the behavior of arithmetic operations in the user preferences have been removed. The default values have been implemented. In cases in which other values have been uses the calculation results change. **(164447 | 24298)**

Line Blocking

- Minor improvements: Line blocking with vehicle interchange as well as that with obligatory recurring actions has been improved and slightly accelerated. This also changes the results of these two procedure variants. **(164785 | 24955)**

Visum Files

- GTFS Import/Export: The GTFS import/export has been adapted to the specification for GTFS (https://gtfs.org/), in particular a .zip file must be specified as the source for the import and a file name of a .zip archive must be specified when exporting. Other requirements listed in the specification are checked and reported accordingly. Older parameter files (*.puti) must be adjusted or lead to corresponding error messages. **(164679 | 24824)**