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13.00-02 [80828]

2013-07-24

## + New Features and Changes

### Data Model:

- + Has no opposing right of way: Nodes and main nodes now have a new attribute that specifies whether the node / main node has a non-opposing right of way or not. A decisive factor are the turn types between the legs of the major flow. **(12538)**
- + Specific transfer walk times: The specific transfer walk times between transport systems and time profiles now have relations to the stop, the from and to transport system or the from and to time profile. **(12655)**

### Dialogs:

- + Entry of formulas: After using buttons to enter operands and binary operators +, -, \*, /, the cursor is now positioned to the right of the operator. For parentheses and all operators containing parentheses, it is positioned between the opening and closing parenthesis. **(12692)**

### Foreign Formats:

- + Export of VDV-data: A new add-on module allows the export of public transport network and timetable-data in VDV452-format. With the exception of line blocks, all relevant data including line route polygons are exported. Optionally, data contained in user-defined attributes can be written to additional columns in the output. The functionality is also accessible through the COM interface. **(11394)**

### Procedure Sequence:

- + Display of current iteration: If a procedure sequence is carried out with a GOTO command, then the current iteration is now also displayed in the procedure status bar, together with the number of current procedure. **(12671)**

### PrT Assignment:

- + Assignment with ICA: The method assignment with ICA has been revised and improved, particularly in terms of accounting for blocking back/congestion. **(12572)**

### PuT Line Blocking:

- + (Minimum) Layover times: For a block element, you can now output the minimum layover time as well as the actual layover time, between the block element and its predecessor / successor, as an attribute. **(11235)**

## ✓ Fixed Bugs

### Add-Ins:

- ✓ Missing Python installation: If there is an old version (2.5 or 2.6) of Python installed, and if the new Python engine 2.7 has not been installed during the installation of Visum 13, Visum crashed while trying to execute any of the Add-Ins. This bug has been fixed. Now an error message is shown in this case. **(12787)**

### COM Interface:

- ✓ Lists: Lists opened by a script during a procedure are now no longer empty, and they are updated in response to changes made in the network, as long as the script is still running. (This does not apply to lists that were opened prior to the execution of the script.) **(12063)**

### COM:

- ✓ AddBackground: This method now also works properly for .ecw files. **(12736)**

### Data model:

- ✔ Formulas and version comparison: If a formula contained an attribute of a version comparison with a loaded network, then the attribute ID could not be resolved. This error has been fixed. **(12809)**
- ✔ Aggregated analysis time intervals: If for an aggregated analysis time interval, analysis time intervals were combined whose start time lay more than 24h after the beginning of the calendar period, then the aggregation results produced were incorrect. This error has been fixed. **(12740)**
- ✔ Assignment of link attributes, turn types, and node filter: The program no longer crashes when in the Network settings, you selected automatic calculation of turn types (one of the two variants) , set a node or main node filter, and used multi-edit on links to change attributes (e.g. number of lanes or transport system set), so that the turn types were completely changed. **(12759)**
- ✔ Delete couplings: The program no longer crashes when you delete couplings, with at least three time profiles coupled, and the coupling is not specified for all time profiles across the same vehicle course. **(12723)**
- ✔ Formula matrices: The program no longer crashes when for formula matrices, you change the network object reference type from "zones" to "No network reference". **(12733)**
- ✔ Formula with attributes containing multiple subattributes: The program no longer crashes when you enter a formula with an attribute that contains multiple subattributes, and the first subattribute is not specified (e.g. '[VOLVEH\_DSEG(,AP)]'). **(12734)**
- ✔ Link orientation "-": It is now no longer possible to enter an invalid orientation "-" in link lists. **(12682)**
- ✔ Multi-edit with invalid attribute values: The program no longer crashes when a set attribute (e.g. VSysSet) is assigned an invalid value via Multi-edit, and the prompt 'Still continue' that followed was answered with 'No'. **(12780)**

#### Dialogs:

- ✔ Edit formula: The program no longer crashes when for a formula (attribute or matrix) the (hidden) row end character is marked, and you click the ')' button to insert parentheses. **(12691)**
- ✔ Filter dialog for hierarchical filters: You can only successfully quit the dialog for hierarchical filters (stops, lines, PrT paths) if the settings made are correct. Previously, if the values entered were not consistent (e.g. min > max for value range), you could switch to the erroneous dialog, but no message indicating the cause was displayed. Now a message is shown in this case. **(12782)**

#### Filters:

- ✔ Conditions specified for set attributes: The program no longer crashes when a filter condition is specified for a set attribute (e.g. VSysSet oder VehCombSet), and one of the objects the set refers to (in our example a transport system or a vehicle combination) is deleted and you subsequently open the filter dialog. **(12779)**

#### Graphical procedures:

- ✔ PrT shortest path search: The program no longer crashes when you perform the PrT shortest path search and the target attribute for the route index does not exist. **(12746)**

#### Installation:

- ✔ Computer restart after update: You no longer need to restart your computer after an update. We also updated the codemeter version from 4.50b to 4.50c. **(12764)**

#### Listings:

- ✔ Aggregation functions: When you change the aggregation function of an aggregated list via the shortcut menu of a column header (e.g. from minimum to maximum), the data is now updated correctly (was previously not updated). **(12693)**
- ✔ Tooltip with multiple decimal places: Tooltips of list cells with floating-point numbers no longer display the number of decimal places exactly as in the cell, but they indicate at least 6 decimal places. **(12564)**

#### Lists:

- ✔ Shape editing within lists: When in a list of digitized network objects (link, zone, line route, ...) you select an object, you can then press F5 or from the shortcut menu choose the corresponding entry to edit its shape. Now the Network Editor is brought to the foreground when you do so. If you then switch from the Network Editor window to a different window, the current shape editing process is canceled. **(12786)**

#### Main Window:

- ✔ 'Matrices' window: Keyboard entries (particularly 'Del') now also work correctly in the 'Matrices' window and are no longer forwarded to other windows. **(12795)**

#### **Miscellaneous:**

- ✔ Fonts in user preferences: When you changed fonts in the user preferences, these were not immediately updated in lists, the junction editor, matrix editor, and the quick view, but only after you had restarted the program. This error has been fixed. **(12612)**

#### **Procedure Sequence:**

- ✔ Delete: You can now use the "Del" key again to delete procedures. **(12763)**

#### **PrT Assignment:**

- ✔ Assignment with ICA: If a warm start is possible, now no ICA assign data or assignments are initialized. Otherwise, ICA assign data and assignments are fully initialized. **(12707)**
- ✔ Blocking Back: During the assignment with ICA, the blocking back model was unnecessarily calculated twice at the end of the procedure. This error has been fixed. The fix only has an impact on runtime. It does not affect the results. **(12772)**
- ✔ ICA, signalized: The calculation of pedestrian factors has been corrected for traffic-actuated RBC. When you previously changed the stage durations during the calculation, the start times of vehicle signal groups changed, and these were not transferred to the pedestrian signal groups. **(12685)**
- ✔ ICA, two-way stop: A queue is now only output at major flows, if there are rank 2 turns with volumes. **(12767)**
- ✔ Paths not found in LUCE: In the LUCE assignment procedure, an error message is now output for relations for which no path is found, since the demand cannot be assigned. **(12762)**

#### **PuT Line Blocking:**

- ✔ Open blocks: In a special case where open blocks with a start and end should be generated in a depot, this depot had unlimited capacity, and a minimum dwell time was required, line blocking could not calculate a solution, although there was one. This error has been fixed. **(12673)**

#### **PuT Operating Indicators:**

- ✔ Sped up calculation: Calculation of the procedure 'PuT Operating Indicators' was again sped up for cases in which only few time profiles are active or no territory-based evaluation is required. **(12731)**

#### **Subnetwork Generator:**

- ✔ Canceling: You can now cancel generating subnetworks when the paths are generated. **(11455)**
- ✔ Line routes: When during subnetwork generation a line route was cut off, and if this line route prior to adopting the section had a time profile item with an extremely large "To time profile" (e.g. 6,000,000 min), Visum crashed. This error has been fixed. **(12728)**

#### **Timetable Editor:**

- ✔ Line block view and open blocks: The program no longer crashes if in the line block view, there are open blocks of a line block version that accounts for preparation and post-preparation time. **(12732)**
- ✔ Stop point selection: If a vehicle journey had a time profile in which the same stop occurred several times and you opened the list boxes for stop point selection, the list always showed the last stop point, instead of the stop point selected. This error has been fixed. **(10779)**

#### **VISUM Files:**

- ✔ Log file: When in the Windows Explorer you used the shortcut menu to open a version file, the log file was named log.txt instead of protocol.txt. This error has been fixed. **(12628)**
- ✔ Procedure parameters: When you load procedure parameter files, values such as tCur and impedance (that depend on your procedure parameter settings) are now updated. **(12726)**

### **! Breaking Changes**

#### **Data Model:**

- ! Has no opposing right of way: Nodes and main nodes now have a new attribute that specifies whether the node / main node has a non-opposing right of way or not. A decisive factor are the turn types between the legs of the major flow. This change further leads to other results of ICS calculation at nodes without opposite main flows whose turns are opened, but whose lane turns are not. **(12538)**

### PrT Assignment:

- ❗ Assignment with ICA: The method assignment with ICA has been revised and improved, particularly in terms of accounting for blocking back/congestion. This will lead to changes in the procedure results. **(12572)**
- ❗ ICA, signalized: The calculation of pedestrian factors has been corrected for traffic-actuated RBC. This will lead to different results for the assignment with ICA, if you are using traffic-actuated RBC. **(12685)**

### PuT Line Blocking:

- ❗ Open blocks: In a special case where open blocks with a start and end should be generated in a depot, this depot had unlimited capacity, and a minimum dwell time was required, line blocking could not find a solution, although there was one. This error has been fixed. The fix also affects other results, as in certain cases now different but equivalent solutions are found. **(12673)**

13.00-01 [80441]

2013-07-05

## + New Features and Changes

### Data Model:

- + Time profile item relation -> Vehicle journey item: Evaluation of the time profile item relation by vehicle journey item has been sped up. **(12541)**

### Foreign Formats:

- + VDV452 import: For VDV452 import, 12-digit version numbers are now permitted in order to accommodate the particulars of supplying systems, even if the format provides for a 9-digit number. **(12641)**

### Graphical procedures:

- + Adding flow bundle terms: The process for adding new terms to a flow bundle has been simplified and is now more logic. When adding new terms, no more dialogs are displayed, but default settings are used for traffic types, similar to as for some network object types. When you add zones, for the first zone of a group, the default traffic type is 'Origin demand'. For the second zone, it is 'Destination demand'. Adding additional zones is still not permitted. The COM methods for adding flow bundle terms have not been changed. **(12588)**

### Graphics:

- + Background maps: The background maps have been rounded off with several smaller improvements. In particular, the map is now also drawn, if there are invalid sections in the visible section. **(12517)**
- + Dynamic legend entries: The new legend now responds to changes of dynamic entries (particularly of the POI categories) by updating the names of the legend items. **(12603)**

### Installation:

- + Codemeter 4.50b: This service pack (and all future ones) require Codemeter version 4.50b or higher. Local dongle drivers are updated automatically during the update process. If network dongles are used on remote computers, the Codemeter runtime software has to be updated on the licence server as well. **(12681)**

### Network Editor:

- + Inserting a stop point: When you insert a stop point, a stop and a stop area are also inserted. Then a type number is entered for the stop point (analogous to code and name), which is also adopted for the stop area and the stop. **(12598)**

### PrT Assignment:

- + ICA, two-way stop: The impact of flared approaches is now accounted for in the calculation. **(12206)**
- + Two-way nodes: Within ICA calculation, for node impedance calculation according to HCM 2000 or HCM 2010, the 'two-stage gap acceptance' method is provided for two-way nodes. **(12278)**

### PuT Operating Indicators:

- + Speed-up for 'only active': The procedure 'PuT operating indicators' has been sped up further for cases in which there are many vehicle journey sections, but only few active ones, and you want to use the active vehicle journey sections only. **(12647)**

### Scenario Management:

- ⊕ Tables in the 'Edit Project' dialog: Tables can now be sorted by any column. You can also use the copy and paste commands for the 'Procedure parameter set' column in the 'Scenarios' dialog. **(11329)**

### TFlowFuzzy:

- ⊕ Display of network objects affected: In the Message window, you can now highlight network objects for which messages are generated during 'Demand matrix correction (TFlowFuzzy)' or the analysis. **(12284)**

### VISUM Files, Scenario Management:

- ⊕ Matrices within model transfer files: Creation of model transfer files has been sped up in the case that identical matrices exist in both networks. This is particularly useful when editing modifications in the context of scenario management. **(12112)**

## ✓ Fixed Bugs

### Add-Ins:

- ✓ Buffers around PuT lines: The program no longer crashes when you carry out the add-in 'Buffers around PuT lines' and the name of one of the lines or line routes contains a special character. **(12620)**
- ✓ Coordinates in VDV452 import: During VDV452 import, coordinates are now converted correctly from degrees into decimals, as commonly used in PTV Visum. **(12639)**
- ✓ Import Transit Supply: When you import supply data via the 'Import Transit Supply' add-in, now also allocations between transport systems are suggested, whose codes only differ in upper and lower case letters. **(12522)**
- ✓ Nested Demand Model: The add-in 'Nested Demand Model' can now also be used with Visum 13. **(12567)**

### COM Interface:

- ✓ SetMultiAttValues and variants: The method SetMultiAttValues and its variants SetMulti of the VisumPy library did not work for the network objects matrix toll, OD pairs, and main zone paris. This error has been fixed. **(12606)**

### Data Model, Other procedures:

- ✓ Different territory indicators: For the attributes Passengers boarding, Passengers alighting, Passengers transferring, Vehicle hours traveled, Vehicle kilometers traveled, and Mean volume per Trip (each per territory), the indication of source has been corrected. In addition, now the number of passengers boarding, alighting and transferring within the territory are also calculated via the procedure 'PuT operating indicators', if you select the option 'Also calculate indicators of the 'Territory indicators' procedure'. **(11818)**

### Data Model:

- ✓ Attribute destination demand at main zone: Evaluation of the attribute 'destination demand-DSeg at main zone' has been significantly sped up. **(12491)**
- ✓ Editing vertices: When you deleted vertices of a toll system that were also used by the polygon of a main node, Visum could freeze. This error has been fixed. **(12686)**
- ✓ Formula attributes: In formula attributes with the operator Round(x,p), operator x was not evaluated, but p was rounded to p places. This error has been fixed. Formula matrices are not affected thereof. **(12688)**

### Demand procedures:

- ✓ Formula matrices in utility definitions: So far you could enter formula matrices in the utility definitions of various demand procedures, but they were deleted when you read in procedure parameters from files (Version file, procedure parameters binary and XML). This is no longer the case, i.e. formula matrices can now be used in utility definitions without any limitations. Demand matrices are no longer deleted from utility definitions, but they are not offered for insertion either. Should you wish to use them, change the formula accordingly. **(12397)**

### Dialogs:

- ✓ Attribute selection: Setting of the C/A/H sorting switch is no longer lost during the session. **(12608)**

- ✔ Editing a non-numeric classification: If in the Graphic Parameters dialog for bars of a network object type, on the dialog side for network object selection (e.g. 'Link selection'), the option 'Bars only on selected links' was activated and a non-numeric attribute selected, Visum crashed when you clicked 'Edit'. This error has been fixed. **(12679)**
- ✔ Ending a search: If you clicked the 'Stop search' button to cancel a search that had already been ended, the search results were deleted. This error has been fixed. **(12611)**
- ✔ Graphic parameters, bar labeling: If for bar labeling, you select 'Sum only', the setting 'Color like bar' does not make any sense and is thus no longer offered in the dialog. **(12503)**
- ✔ Network statistics: In the network statistics, line data and main line data were mixed up. This error has been fixed. **(12637)**
- ✔ Parameters for volume-delay function: The program no longer crashes when in the dialog 'Volume-delay function parameters', 0 is entered as the volume-delay function number. **(12597)**
- ✔ Position outside the screen: When dialogs are opened, it is now checked whether their position saved during the last session lay outside the screen. If this is the case, the position saved is discarded and the dialog is opened and displayed at its initial position. **(12220)**
- ✔ Search dialog: After you restored the search dialog from a version file, the results list was initially empty until the search was started again. This error has been fixed. **(12610)**
- ✔ Search dialog: The column widths of the table are saved per network object type and are restored when reopened. **(12609)**

#### **Filters:**

- ✔ Line filters and couplings: The line filter was not always fully updated when you created or deleted couplings. This error has been fixed. **(12539)**

#### **Foreign formats:**

- ✔ VDV452 import: Relations between data records in VDV452 data, partly specified with leading zeros, could not be resolved when read in. This was particularly true for line numbers with leading zeros. This error has been fixed. **(12683)**
- ✔ Internet maps: You can now read in Internet maps, even if the project directory has been changed. **(11065)**

#### **Graphical procedures:**

- ✔ Canceling flow bundle calculation: It is now possible to cancel flow bundle calculation again. **(12636)**
- ✔ Flow bundle and toll systems: When you calculated the flow bundle volume for toll systems, the corresponding value was not initialized, i.e. the result was always added to the existing value. This error has been fixed. **(12621)**
- ✔ Supply selection with flow bundle terms: For some flow bundle terms, the 'Supply' tab did not respond to changes made in the 'Passenger types' tab. Now - depending on the passenger types selected - the left or the right half of the 'Supply' tab becomes inactive again. **(12602)**

#### **Graphics:**

- ✔ Autotexts when printing lists: In Version files of previous Visum versions, autotexts in print frames of lists were not always recognized as such. As a result, text was displayed (e.g. 'Page [page number] / [number of pages]' instead of 'Page 17 / 35'). This error has been fixed. **(12605)**
- ✔ Background maps: No more crash due to lack of memory if the 'intensity' value within the graphic parameters of background maps is set to a value different from 100%. **(12724)**
- ✔ Background maps: Online background maps used as usual background appear to be completely black since service pack Visum 12.52-14. This problem occurs in 32bit program version only and has been fixed now. **(12729)**
- ✔ Bar labeling in the 'Sum only' mode: When you used 'Sum only' as the bar label, the option 'Do not show if value <= X' did not work properly. Now a value is no longer displayed, if the sums of the individual bars lie under their respective threshold (there is no common sum threshold). **(12502)**
- ✔ Double spaced footer in print frame: In print frames with a double spaced footer, the footer was not displayed correctly. This error has been fixed. **(12684)**



- ✔ Drawing bars using rounded values: The value set for a bar in the 'Round to' attribute was always interpreted metrically and the lengths were specified in [m]. Now the "Long length" attributes are rounded to [km]. Imperial units are rounded accordingly to multiples of the applicable unit of measure. **(12324)**
- ✔ Legend with images: The program no longer crashes when opening a version file with a legend that contains autotexts with references to images and the image files cannot be loaded. **(12554)**
- ✔ Printing after changing projection: When you transformed a network into another coordinate system and afterwards printed the entire network, the section was wrong. This error has been fixed. **(12616)**

#### Junction Editor:

- ✔ Allocating SC of the type VISSIG: The program no longer crashes when in the Junction Editor, you create a SC of the type VISSIG, for which a node has already been supplied or for which there is no node. **(12638)**
- ✔ Signal program of VISSIG controllers: In the Junction Editor and in the 'Edit SC' dialog, the option 'no signal program' is no longer available for the signal program of VISSIG signal controls (SC), as it no longer represents a valid status. You can model switching of the SC via the 'Switched off' attribute. **(12584)**

#### Main Window:

- ✔ Opening graphic parameters via Ctrl + G: In windows that have their own graphic parameters, the short key combination Ctrl + G will now open their graphic parameters dialog. If no window, or one of the tool windows is active ('Network objects', 'Matrices', 'Find',...), Ctrl + G will open the graphic parameters dialog of the active window. **(11658)**

#### Matrix Editor:

- ✔ Binary arithmetic operations with an external matrix: For binary arithmetic operations (adding, multiplying, etc.), you can now, via file selection, choose an external matrix again as a second operand. **(12607)**

#### Network comparisons:

- ✔ Model transfer file view: If in the model transfer file view, you collapse a node in the tree, the latter is no longer selected. In particular when you activate synchronization, the network objects (after collapsing their tree view) are then no longer highlighted in the Network Editor. **(12500)**
- ✔ Suppressing messages: When creating the network merge mode, you can now suppress further messages of the same priority. Messages that are generated when you read in version files must be suppressed separately. **(12591)**

#### Network Editor:

- ✔ Delete enclaves: The special multi-edit command 'Delete enclaves' did not work for area objects. This error has been fixed. **(12596)**
- ✔ Display when editing shape of line route: If you edited the shape of a line route and then clicked Undo, the previous route was highlighted in yellow again, but so was the route edited before the Undo operation. This error has been fixed. **(12626)**
- ✔ Network check - suitability for ICA: The check for ICA suitability via the 'Network check' function is now only performed for nodes with the ICA calculation method. **(12555)**
- ✔ Shortening line route via multiple traversed stop points: When you shortened a line route of the course A-B-C-B-C-D with a fixed second traverse of C, so that the second traverse of C became the new starting point, the detour to B remained part of the course (C-B-C-D instead of C-D), if the first occurrence of stop point C was a route point and the second was not. This error has been fixed. **(12079)**

#### Other procedures:

- ✔ 'Initialize all filter settings' procedure: During the 'Initialize all filters' procedure, the POI filter was not initialized. This error has been fixed. **(12546)**
- ✔ 'Territory indicators' procedure: When you now calculate the vehicle hours for territories, run times on main turns are also taken into account. **(12586)**
- ✔ Emission calculation according to HBEFA manual: When you performed an HBEFA emission calculation multiple times during a VISUM session, after 254 times, the files could no longer be opened and the calculation could not be performed. This error has been fixed. **(12648)**

#### PrT Assignment:

- ✔ Two-way stop, queue lengths: Queue lengths were wrongly output at rank 1 turns, if the leg had no rank 2 turn. If the rank 2 turn shared a lane with a rank 1 turn, and there were also other lanes, the queue length output at the rank 1 turn was far too long. **(12630)**

#### **PuT Assignment:**

- ✔ Headway in headway-based assignment longer than 2 hours: If in headway-based assignment, you only accounted for active time profiles, a filter was set, and the headways were adopted from a time profile attribute, the following message: 'There is an average headway of more than 2 hours.' was not always displayed. This error has been fixed. **(12680)**

#### **PuT Line Blocking:**

- ✔ Open blocks: If during line blocking open blocks were generated and the link run time t-PuTSys for the transport system used was always 0, Visum could enter an infinite loop. This error has been fixed. **(12593)**

#### **Scenario Management:**

- ✔ Long paths: The program no longer crashes after performing a scenario calculation when the path to the basic project folder is too long. **(12601)**

#### **Scenbario Management:**

- ✔ Remove computation node: No more crash when removing a computation node, if its status is being updated at the same time. **(12642)**

#### **Timetable Editor:**

- ✔ Scrollbar in tabular timetable: The scrollbar in the bottom left quadrant of the tabular Timetable Editor now allows you to scroll, if the total column widths exceed the quadrant's width. **(11190)**
- ✔ Timetable Editor opened for line selection: When the Timetable Editor was opened for an extensive selection of lines, a warning was displayed that the calculation of the stop sequence might take quite some time. Now the Timetable Editor is no longer opened. You can change the number of selected lines / line routes in the Network Editor. **(11290)**

#### **VISUM Files:**

- ✔ Canceling read network: The program no longer crashes after you cancel non-additive reading of a network file, a demand file or a model transfer file. **(12595)**
- ✔ Reading version file: Reading a version file failed, when you mistakenly assigned a PrT mode more than one transport system and the file contained assignment results. This error has been fixed. **(12656)**
- ✔ Write version / RBC: In certain cases, networks containing RBC controllers could not be saved and Visum crashed. This error has been fixed. **(12559)**

### **! Breaking Changes**

#### **Installation:**

- ! Codemeter 4.50b: This service pack (and all future ones) require Codemeter version 4.50b or higher. Local dongle drivers are updated automatically during the update process. If network dongles are used on remote computers, the Codemeter runtime software has to be updated on the licence server as well. **(12681)**

#### **Other procedures:**

- ! 'Territory indicators' procedure: When you now calculate the vehicle hours for territories, run times on main turns are also taken into account. For networks that include main turns, this changes the results accordingly. **(12586)**

**13.00-00 [80106]**

**2013-06-21**

### **+ New Features and Changes**

#### **Add-Ins:**

- + A new Add-in for the creation of reports for highway validation has been added. The Add-In can be inserted into the procedure flow and generates an Excel-sheet with comparisons of surveyed and calculated values. You can define thresholds and results can be displayed with different charts. **(11365)**



- ⊕ A new Add-in for the creation of reports for public transport validation has been added. The Add-In can be inserted into the procedure flow and generates an Excel-sheet with comparisons of surveyed and calculated values. You can define thresholds and results can be displayed with different charts. **(12169)**
- ⊕ General: The Python library numpy which is deployed with Visum was updated and exchanged with a version optimized for the Intel Math Kernel Library MKL. This should result in faster operation of Add-Ins making use of numpy (e.g. CalculateMatrix), but can eventually also lead to deviating results. **(11379)**
- ⊕ In addition to the assignment report for highway there is now an Add-in for the generation of assignment reports for public transport. The Add-in can be implemented into the procedure and produces an Excel file and/or a PDF document that contains a summary of assignment results. **(10800)**
- ⊕ Message handling: The Add-Ins included in the standard installation have been adapted to the new COM-methods (11175). Thus procedure runs will be stopped, if an error occurs. **(12427)**

#### COM Interface:

- ⊕ Mapmatcher: It is now possible to define the relevant attributes of links and turns for the shortest path search within the mapmatcher. So far, only the shortest path (lengths of links) was available. **(12148)**
- ⊕ Scripts and Add-Ins can now send (optionally) errors to the procedure run using new COM-methods (IVisum: PostOperationResultMessage, PostFailure, PostUserCancelled, Log, Ask). Thereby it can be avoided that the full procedure run is executed unintently. **(11175)**
- ⊕ Standard values of links: There is now a COM method 'SetDefaultsFromLinkType', which applies standard values to links. With this, it is among other things possible to set standard values within a procedure flow by incorporating a brief COM-script into the procedure flow. **(11137)**

#### Data model:

- ⊕ Attributes for Line block items: Reading in of attribute files for block items is possible now. **(7864)**
- ⊕ Relation Nodes on Vehicle journey: For object Vehicle journey there is a relation to object Nodes. This can be used e.g. to set a filter for traversed nodes. **(10704)**
- ⊕ Control of channelized right turns: The data model has been extended by the value "without" for the leg attribut channelized control. **(12419)**
- ⊕ Formulas: The possibilities to define formulas have been extended. Now it is possible to apply binary and unary operators as well as transformations and to insert parentheses to the formula. This new definiton of formulas is available for the definition of matrices and attributes with formulas and in the procedures 'Combination of matrices and vectors' and 'Edit attribute'.  
In the COM-interface, the objects ILinCombPara representing parameters of the procedure "Linear combination of matrices and vectors" and IEditAttributePara representing the parameters of the procedure "Edit attribute" were removed. They are replaced by the new objects IMatrixFormulaPara and IAttributeFormulaPara, respectively. **(10243)**
- ⊕ Territories and POI with surfaces can now be aggregated. Generally, this functionality can be used for all marked or active objects with surfaces. **(11584)**
- ⊕ The list 'Transfer and walktimes within stop' has an additional attribute 'Direct Distance' **(10206)**
- ⊕ The PuT path legs list contains a new relation to vehicle journey items. This allows access to all elements between the Start time profile item and End time profile item. **(11694)**
- ⊕ There are new relations for vehicle journey items which enable access to attributes of the previous and next vehicle journey item. **(11473)**
- ⊕ When copying line routes with coupling sections, warnings will be generated. **(11389)**

#### Demand Procedures:

- ⊕ Tour-based model: It is now possible to define function type and parameters of the distribution utility for each combination of person group and activity (and mode) independently. **(12098)**
- ⊕ Tour-based model: It is now possible to define function type and parameters of the mode choice utility for each combination of person group and mode (and activity) independently. **(12097)**
- ⊕ Trip distribution: The trip distribution of the 4step-model is now multi-threaded. **(11978)**

#### Dialogs:

- ⊕ By default the Tab Multiple in the Edit line route dialog shows all time profiles. This is also the case when adding new time profiles in the dialog. **(11023)**

- ⊕ Optionally, meaningful default class limits for the classified display are provided if the attributes have a restricted value range (type: enum, bool, string). **(9214)**
- ⊕ The setting of default values for user-defined attributes of type bool has been improved. **(12101)**
- ⊕ The Tabs PrT-TSys and PuT-TSys of the link dialog have been improved. **(11731)**
- ⊕ User-defined-attributes: When adding new user-defined attributes, Visum automatically fills the Code and Name from the field AttID, if the target fields are empty. **(10434)**

#### Filters:

- ⊕ Empty values: With the filter operation "Is Empty" it is possible to filter empty values in user-defined attributes. **(11480)**
- ⊕ Filter dialogue: One or several filter conditions can be duplicated **(9643)**

#### Foreign formats:

- ⊕ OpenStreetMap: The memory consumption during import of OpenStreetMap files was reduced, allowing larger input files to be processed **(12253)**
- ⊕ Import of VDV-data: A new add-on module allows the import of public transport network and timetable-data provided in VDV452-format. With the exception of line blocks, all relevant data including line route polygons are converted to the respective Visum-objects. Existing additional data columns are imported to user-defined attributes. The functionality is also accessible through the COM interface. **(11393)**
- ⊕ OpenStreetMap: The importer for OpenStreetMap-data has been extended. It is now possible to import data related to Public Transport (stops, railway tracks and line routes), Barriers and arbitrary other (points, areas) as POIs. Due to the changes, minor modifications may be required for existing user defined import configurations. **(11439)**

#### Graphical Procedures:

- ⊕ The supply filter for stops in the flow bundle has been improved. For both columns it has been clarified to which passenger types the supply applies. The improvement also offers new options for filter definitions. **(11568)**
- ⊕ When calculating PrT isochrones it is now possible to limit the search to a maximum value which applies to the selected route choice criterion. If this value is reached and the unlimited search deactivated, the shortest path search is aborted, i.e. paths beyond the maximum value are not considered. **(12131)**

#### Graphics:

- ⊕ Background maps: Now internet maps (Bing, WMS, OpenStreetMap) can not only be downloaded as a static map, but also embedded as a live background map. When the map is activated, it automatically loads the corresponding image section and updates automatically when zooming or panning. **(11438)**
- ⊕ Scaling of Text object: When inserting a Text object, until now you could define a fix size which remains the same when zooming in and out. Now there is the option to relate the size to the network coordinates. The text size are scaling now when zooming, the size stays the same related to the network. **(11579)**
- ⊕ The dialog of the legend of the network editor has been modernised, e.g. now the manifold options are clearly arranged in different tabs of the dialog. **(11220)**
- ⊕ There is a new option for the display of bar labels to avoid overlapping when drawing. Additionally, the visibility of the bar labels can be adjusted using corresponding options. **(2502)**
- ⊕ Transfer display of regular services: Bars can be displayed depending on the marking of service groups. Three different drawing modes are available. **(11537)**
- ⊕ Transfer display of regular services: The display of the transfer and walk times (out ring) can now be switched off in the graphic parameters of the transfer display of regular services. **(11535)**

#### Junction editor:

- ⊕ When a version file is saved with an open junction editor view, the node in the junction editor is restored when the version file is opened. **(11302)**

#### Main Window:

- ⊕ A new view showing messages of different priorities has been introduced. Like other views the message window offers the standard functionality of synchronisation, which allows easily errors and warnings to be analysed. **(7177)**
- ⊕ All active procedures in the procedure sequence can now be started using a start-icon in the main toolbar without having to open the procedure sequence. **(9543)**
- ⊕ For reasons of standardization some entries in the menus for lists, the time space diagrams, matrix editor and matrix histograms have been renamed. **(12209)**
- ⊕ List menu: The list menu has been reorganized. One aspect was to reduce the length of the menu to ensure the usability also on small screens. Second aspect was to adapt the menu to the corresponding menu in PTV Vissim 6. **(11853)**
- ⊕ Search Function: The functionality has been improved significantly. It is now possible to search in any and also in several attributes simultaneously. The search window, which can be docked in the main window, includes a list of search results **(7513)**
- ⊕ The menu Extras has been removed. The dialog Program status was renamed to Network statistics and can be found under menu Network. The log files can be accessed under menu File -> Show log files. The license dialog can be found in the menu Help. **(12293)**
- ⊕ The toolbar 'Spatial Selection' is now docked to the network editor instead of the main window, as most operations relate to the network editor. **(12225)**
- ⊕ Window docking: All tool windows (e.g. 'Network', 'Quick view') can now be docked also at the bottom and top of the main window. This is in particular attractive for the new view 'messages.' **(12488)**

#### **Matrix editor:**

- ⊕ It is now possible to export matrices to a data base from the list view in the matrix editor. **(10821)**

#### **Miscellaneous:**

- ⊕ A default can now be defined for the direction of traffic for new networks. **(12281)**
- ⊕ Changes to naming, installation folders and documentation: The installation folders and shortcuts have been unified among the different applications belonging to the PTV Vision Suite. All shortcuts are now by default placed in a group/start menu folder named *PTV Vision 2013* and are stripped to integer version numbers (PTV Visum 13). Also the installation folders and the locations for user-specific files have been adapted and unified in this manner. Thereby, log files, projection files, configurations for the OpenStreetMap-Importer etc. are now located at *%AppData%\PTV Vision\PTV Visum 13\*. All demo networks, examples and tutorials are now installed separately in a folder *PTV Vision\PTV Visum 13* which is located below *Users\Public\Documents*, which contains data shared among all users of the system. This allow the examples and tutorials to be modified in place without the need to copy them to an editable location first.  
The COM documentation has been reorganized. The COM interface reference is now included with the Online Help in the common help format and now also includes information about attributes and relations of the network objects. The other parts of the former COM documentation are available in the document *C:\Users\Public\Documents\PTV Vision\PTV Visum 13\COM\Introduction to the PTV Visum COM-API.pdf* **(11347)**
- ⊕ Python-Support: Visum now likewise uses Python 2.7 on all platforms (instead of Python 2.5 on 32-Bit and Python 2.6 on 64-Bit as before) for the execution of Add-Ins and other Python scripts. The Python libraries (numpy, wx,...) were updated to up-to-date versions for Python 2.7. **(11380)**
- ⊕ The COM-reference has been incorporated into the online help and now also covers attributes and relationships of the network objects. **(11787)**
- ⊕ The menu ? was renamed to "Hilfe" in the German version. **(12204)**
- ⊕ The menu entry Options has been renamed to User preferences and can be found in the Edit menu. The entry Network parameters has been renamed to Network settings. **(12294)**
- ⊕ Windows 8: PTV Visum 13 was prepared for operation with Windows 8. Due to the missing start menu in Windows 8, all of the start menu shortcuts to examples and documents which used to be created in the installation process were replaced by internal shortcuts accessible through the Help-menu. The only remaining shortcuts are those to the Visum executable and to the Scenario calculation server. These are grouped together with shortcuts to other PTV Vision applications in the group 'PTV Vision 2013'. Furthermore, the CodeMeter runtime shipped with Visum was upgraded to version 4.5 which is the first release providing support for Windows 8. All these changes not only apply to Windows 8 installations, but are effective on older platforms as well. **(11545)**

### Network comparisons:

- + Display percental deviations: Percental deviations with a value of 0 as denominator are considered as infinite values and are displayed with maximum bar width. In lists etc. they are represented as MIN or MAX. **(9325)**

### Network editor:

- + Interaction modes: When changing between different interaction modes in the network editor (adding, spatial selection, zooming, Flow Bundle, Shortest Path Search,...), users could end up in confusing and inconsistent states. The management of these interaction modes was refurbished and now falls back to the previous mode when an activity is stopped. The title bar of the network editor window informs about the current mode (e.g. Edit:Nodes). Furthermore, the dialogs of the graphical tools (Flow bundle, Shortest Path Search, Isochrones, Turn Volumes, Desire Lines, Path Projections) were replaced by a single dockable tool window and their layout was optimized for vertical display besides the network editor window. **(4819)**
- + Valid days which include the same days can now be combined to one valid day. **(12279)**
- + Edit shape of line routes: There is a new function 'Fix all profile points', which makes it easier to avoid unintentional deleting of profile points from line routes. **(10890)**
- + Edit Shape: Editing shapes of area objects works now smoother also in case of very high number of area objects in the network. **(11096)**
- + Fuzzy surface alignment: There is now a function to align surface borders, which do not match perfectly. This function is available special function of area objects, during the shapefile import, via COM and in the network settings. **(11585)**
- + Redirect links: It is now possible to change from- and to-node of an existing link. **(11566)**
- + The context menu of lines contains a new entry that enables the disaggregation of lines. **(11570)**
- + The context menu of lines has a new entry which allows coupling sections to be deleted. **(11581)**
- + The dialog for lines and line routes, respectively, has been extended by the column 'In selection'. **(11580)**
- + The function 'Normalize Surfaces' is now available for selected polygons, either via special function at all network objects and in the 'Network settings' under 'Surfaces'. **(11586)**
- + The options for line aggregation have been extended. **(11569)**

### Other Procedures:

- + Blocking back calculation: The formula for the calculation of the average waiting time has been changed. The average waiting time is the total waiting time divided by the effective capacity of the link. **(12128)**
- + Calculate service trip patterns: An extension of this function enables the entry of a lower boundary as base frequency. **(12347)**
- + Run script: Optionally, it is possible to save Python script code in the procedures and execute this as script. **(3701)**
- + Signal offset analysis: When executing the procedure the dialog is now reporting the progress. **(11208)**
- + The procedure 'Edit Attribute' can now also edit attributes of the network. **(11630)**

### PrT Assignment:

- + Assignment with ICA: The assignment method has been revised and improved. Especially, the effects of blocking back are better replicated. **(10239)**
- + ICA calculation: The attribute "ICA upstream adjustment" is now an attribute of the turn. The value range of the turn attribute is restricted to [0.09; 1.0]. **(12423)**
- + ICA, average back of queue: The turn attribute 'ICA average back of queue' is calculated now also for nodes with the control type All-way Stop, two-way yield, two-way stop and roundabout (HCM). Additionally, if the turn volume at a two-way yield node has the volume 0, the queue length is set to 0. **(12537)**
- + ICA, signalized: The base saturation flow can now be edited globally for ICU 1 & ICU 2 methodologies in the general procedure settings. **(12424)**

- + ICA, signalized: The factor  $f_{bb}$  (attribute of the leg) was replaced by an attributes for the definition of the local bus stopping rate. **(12336)**
- + ICA, signalized: The factor  $f_p$  (attribute of the leg) was replaced by attributes for the definition of the number of parking movements on the left and right side of the street. **(12337)**
- + ICA, two-way control: The ICA calculation for two-way controlled nodes takes the leg attribute value for channelized control according to the HCM into account. **(12313)**

#### **PuT assignment:**

- + The connection file now contains an identification-string. **(12218)**
- + Headway-based assignment: Time profiles without service trips are ignored in the route search and choice if the automatic headway calculation is used. **(11902)**
- + The calculation of fares has been internally improved. This has positive effects on run times of all procedures using the fare calculation such as assignment or line cost calculation. **(11992)**
- + The scaling of the timetable-based assignment has been improved. The improvement becomes effective when many cores are used. **(11567)**

#### **PuT Line blocking:**

- + Timetable optimization: By the entry of negative layover times Visum can indicate possible optimizations of the timetable. **(11780)**
- + Interpretation of pre and post preparation times: Pre and post preparation times (layover times) are in practice not always considered as fix. An extension enables an interpretation as "soft" in order to find a balance between shortfall of minimum layover times and number of required vehicles. **(11351)**
- + The procedure line blocking with vehicle interchange runs faster now. **(12146)**

#### **PuT Operating Indicators:**

- + Optionally, the number of service trips can be calculated for turns and main turns, respectively. **(2696)**
- + The procedure PuT Operating Indicators is now multi-threaded. **(11571)**

#### **PuT Passenger Survey:**

- + Plausibilization of survey data: The options for the search of the preceding and succeeding lines, respectively, have been extended. **(10386)**

#### **Scenario Management:**

- + Distribution of calculation to several computers. This module enables the calculation of scenarios to several computers (computation nodes) which are in one network. All available computers are identified automatically and listed. The scenarios to be calculated can now be assigned to the computation nodes individually. The data are transferred to the computation nodes and calculation started. Optionally the calculated results can be transferred back to the origin machine. **(11435)**
- + Network comparisons: The second operation mode of comparing versions, in which the comparison versions stays opened in the background (new in Visum 12.5) is now also available in the version comparison in the scenario management. **(11188)**
- + The file extension `.vpdb` is now automatically linked to Visum, i.e. double click on a `.vpdb` file opens Visum. **(11512)**
- + When comparing scenarios the name 'This network' is now replaced by the code of the leading scenario. **(10317)**

#### **Schematic line diagram:**

- + Bundling edges: In addition to the option to couple edges manually there are several new options. They are:
  - Edges are bundled for equal selected attributes
  - Edges are bundled for same regular service pattern
 The option "Bundle coupled edges" can now be limited to selected edges. **(11634)**
- + Differentiation of labelling of 2-hourly displays. The schematic line diagram has the capability of hourly or 2-hourly displays. For the differentiation of desired displays (such as arrival and departure times) it needs a more sophisticated labelling system. This is done by an extension of the graphic parameter settings. **(11562)**



- + Display of edges according to defined time frames. The options for the display of edges is extended by the option to define time frames. The vehicles journeys are not filtered, but the edges are not displayed when a vehicle journey is outside the defined time frame. This is useful in particular for long-distance journeys where edges are cut which are outside the time frame. **(11564)**
- + Edges inside transfer nodes. Edges can now be edited within a transfer node. The edge can have any shape as long as it is inside the transfer node. **(11559)**
- + When closing a schematic line diagram Visum now saves the layout and prahic parameters internally and offers to apply them, when opening new schematic line diagram view is opened. **(11558)**

#### Subnetwork Generator:

- + The settings of the sub network generator can now be saved to an .xml file. **(9298)**

#### Timetable editor:

- + Display classic stop sequence: Display has been enhanced by the option to define preferred stops. **(12326)**
- + Find line block item: In the 'Block view PuT line blocks' there is now a dedicated dialog to find line block items. **(12412)**

#### VISUM files:

- + The names of the output files have been changed from log.txt into protocol.txt and message.txt into messages.txt. **(12315)**
- + In the ANM Export the attribute 'ReducedSpeed' in the ANM file can be mapped to an attribute of lane turns. The value of the attribute is the speed, that is used for the generation of reduced speed areas. Negative values prevent the automatic generation of reduced speed areas. **(11233)**
- + Optionally, numbers with decimal places can now be saved with up to 12 decimal places in files of type .net, .dmd, and .tra. **(10742)**
- + The calcaultion of a sub network and the ANM Export can be done in one step. Optionally, a PrT assignment can be executed in the sub network and the files can be imported into Vissim. **(10198)**

### ! Breaking Changes

#### Add-Ins:

- ! General: The Python library numpy which is deployed with Visum was updated and exchanged with a version optimized for the Intel Math Kernel Library MKL. This should result in faster operation of Add-Ins making use of numpy (e.g. CalculateMatrix), but can eventually also lead to deviating results. **(11379)**
- ! Message handling: The Add-Ins included in the standard installation have been adpated to the new COM-methods (11175). Thus procedure runs will be stopped, if an error occurs during the Add-in execution. **(12427)**

#### COM:

- ! The COM-method Visum.Net.GraphicParameters.UpdateGU has lost its function and was removed. **(11798)**

#### Data model:

- ! Attribute "Vistro Share HGV": The attribute 'Vistro Share HGV' for Turns and Main Turns was renamed to "Share HGV". The turn attribute is no used in ICA calculations instead of the also existing link attribute "Share HGV". This may change results of ICA calculations. **(12307)**
- ! Formulas:  
The possibilities to define formulas have been extended. In the COM-interface, the objects ILinCombPara representing parameters of the procedure "Linear combination of matrices and vectors" and IEditAttributePara representing the parameters of the procedure "Edit attribute" were removed. They are replaced by the new objects IMatrixFormulaPara and IAttributeFormulaPara, respectively. **(10243)**

#### Demand procedures:

- ! Gravity models: The computation of doubly constrained gravity models (e.g. used in trip distribution or interactively in 'Projection/Projection by Territory' in the matrix editor) internally used wrong matrix sums. This was fixed. Due to the change, diverging results may occur in certain demand models. **(12178)**



## Main Window:

- ❗ The menu Extras has been removed. The dialog Program status was renamed to Network statistics and can be found under menu Network. The log files can be accessed under menu File -> Show log files. The license dialog can be found in the menu Help. **(12293)**

## Miscellaneous:

- ❗ Changes to naming and installation folders: The installation folders and shortcuts have been unified among the different applications belonging to the PTV Vision Suite. All shortcuts are now by default placed in a group/start menu folder named *PTV Vision 2013* and are stripped to integer version numbers (PTV Visum 13). Also the installation folders and the locations for user-specific files have been adapted and unified in this manner. Thereby, log files, projection files, configurations for the OpenStreetMap-Importer etc. are now located at *%AppData%\PTV Vision\PTV Visum 13\*. Scripts, making assumptions about these folders need to be adapted. **(11347)**
- ❗ Python-Support: Visum now likewise uses Python 2.7 on all platforms (instead of Python 2.5 on 32-Bit and Python 2.6 on 64-Bit as before) for the execution of Add-Ins and other Python scripts. The Python libraries (numpy, wx,...) were updated to up-to-date versions for Python 2.7. This may eventually require to adapt custom Python scripts. Furthermore, procedures making use of Add-In operations may eventually lead to derivating results. **(11380)**
- ❗ Spatial reference system transformations: There network is no longer offset from the correct position when changing the spatial reference system (SRS) to a SRS with a different geodetic datum without ToWGS parameters available. The internal changes also affect length calculations and intersections with buffers, whereby procedures using these methods or attributes may compute diverging results. **(12440)**
- ❗ The menu entry Options has been renamed to User preferences and can be found in the Edit menu. The entry Network parameters has been renamed to Network settings. **(12294)**

## Network comparisons:

- ❗ Display percental deviations: Percental deviations with a value of 0 as denominator are considered as infinite values and are displayed with maximum bar width. In lists etc. they are represented as MIN or MAX. In cases where such values are used in further calculations, results may deviate from previous versions. **(9325)**

## Other procedures, HBEFA:

- ❗ The intersect operation (used interactively in 'Multi-edit' in 'Intersect'-procedure and in the calculation of cold emissions in HBEFA) now respects the projection defined for the network when evaluating buffers. This may lead to diverging results in both procedures. **(11246)**

## Other procedures:

- ❗ Division by 0 in 'Edit attribute': The procedure 'Edit attribute' used to return a 0 when executing a division by 0 in one of the terms, even if the target attribute supports empty values. The interactive operation and formula attributes correctly return empty values. The 'Edit attribute'-procedure now also returns an empty value (except if one of the other terms results in a non-empty value, of course) **(12053)**
- ❗ Blocking back calculation: The formula for the calculation of the average waiting time has been changed. The average waiting time is the total waiting time divided by the effective capacity of the link. **(12128)**

## PrT Assignment:

- ❗ Assignment with ICA: The assignment method has been revised and improved. Thus, the results of the assignment change. **(10239)**
- ❗ Cycle time optimization: Due to some internal changes, the results of signal time optimization may change in some specific cases (Signal controllers with only non-conflicting signal groups), if multiple equally good solutions exist. **(11791)**
- ❗ ICA calculation: The attribute "ICA upstream adjustment" is now an attribute of the turn. Thus, the calculation results obtained change accordingly. **(12423)**
- ❗ ICA, signalized: The factor *f\_bb* (attribute of the leg) was replaced by an attributes for the definition of the local bus stopping rate. When reading data from earlier version the old factor will be converted into the new attribute. This may change ICA results, if the old factor was at the edges of the range of valid values. **(12336)**

- ❗ ICA, signalized: The factor  $f_p$  (attribute of the leg) was replaced by attributes for the definition of the number of parking movements on the left and right side of the street. When reading data from earlier version the old factor will be converted into the new attributes. This may change ICA results, if the old factor was at the edges of the range of valid values. **(12337)**

#### **PuT assignment:**

- ❗ The connection file now contains an identification-string. This avoids crashes when reading other binary files. **(12218)**
- ❗ Headway-based assignment: Time profiles without service trips are ignored in the route search and choice if the automatic headway calculation is used. Thus, calculation results can change. **(11902)**
- ❗ The timetable-based PuT assignment did not consider vehicle journey which start before the assignment time interval and end after its end plus extension. Especially when using short assignment time intervals and extensions, this resulted in not all possible connections being found. This bug was fixed, which may lead to diverging assignment results. **(11738)**

#### **PuT Line blocking:**

- ❗ Through some internal improvements, the results of line blocking and block check are always consistent. This may lead to diverging results of the line blocking procedure. **(12277)**
- ❗ Some minor errors in the assessment of waiting times occurring in rare scenarios have been fixed. These may lead to diverging results in some situations. **(11677)**

#### **PuT Operating Indicators:**

- ❗ Calculation of vehicle costs: The vehicle costs for territories were calculated wrongly in some constellations:
  - when the network contains a valid line blocking version, but a different vehicle combination was assigned to a vehicle journey section **after** the line blocking was calculatedThe error was fixed, therefore the results for the "Territory all" change and are now consistent with the results for the line hierarchy. **(12078)**
- ❗ In networks containing links of length 0, the procedure PuT Operating Indicators may have produced results where the sum of 'ServiceKM of lines' was different than the sum of 'ServiceKm of territory "TERRITORYALL"'. This was fixed, which may of course lead to diverging results of the procedure PuT operating indicators in these cases. **(12095)**

#### **VISUM files:**

- ❗ The names of the output files have been changed from log.txt into protocol.txt and message.txt into messages.txt. **(12315)**