

# What is new in PTV Vissim/Viswalk 2021

Abstract geometric shapes in shades of red and orange, consisting of overlapping triangles and polygons, creating a dynamic, modern design in the bottom right corner of the page.

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# Content

<b>Preamble.....</b>	<b>4</b>
<b>1 Vehicle Simulation .....</b>	<b>5</b>
1.1 Parking Evaluations.....	5
1.1.1 Vehicles .....	5
1.1.2 Parking Spaces .....	6
1.1.3 Parking Lots .....	6
1.1.4 Parking Lot Groups .....	7
1.1.5 Parking Routing Decisions .....	7
1.2 Formula Routes .....	7
<b>2 Pedestrian Simulation.....</b>	<b>8</b>
2.1 Formula Routes .....	8
2.2 RSET.....	8
2.3 BIM Import.....	8
2.4 CAD Import .....	8
<b>3 Visualization.....</b>	<b>9</b>
3.1 Live 3D Buildings .....	9
3.2 Parking Evaluation Data .....	9
3.2.1 Color Schemes for Parking Lots .....	9
3.2.2 Vehicle Color for Parking State .....	10
<b>4 Handling.....</b>	<b>11</b>
4.1 GUI for Simple ITS.....	11
4.2 Attribute Selection Dialog .....	11
4.3 Named Color Schemes .....	11
4.4 Context Menu Key .....	11
<b>5 Other.....</b>	<b>12</b>
5.1 Attribute Modifications .....	12
5.2 Recording in Multirun.....	12
5.3 ANM Import.....	12
<b>6 Technical Changes .....</b>	<b>13</b>
6.1 CodeMeter Runtime.....	13
6.2 Python .....	13

## Preamble

This document provides an overview of PTV Vissim/Viswalk's important updates from version 2020 to Version 2021 regarding handling and program behavior. The functionality previously added in version 2020 service packs is not included in this document. Please see the version 2020 service pack release notes for these features. The release notes for versions 2021.00-xy include additional new features that are not covered in this highlight document.

Detailed descriptions of how to use the new functionality can be found in the Vissim 2021 online help and in the document "Vissim 2021 - Manual.pdf".

# 1 Vehicle Simulation

## 1.1 Parking Evaluations

There are several new result attributes for vehicles, parking spaces, parking lots, parking lot groups, and parking routing decisions. All of these can be activated (individually per network object type) in the Evaluation Configuration dialog to collect data during a simulation run.

### 1.1.1 Vehicles

The vehicle attribute "Parking state" can have new values, and some of the existing ones have had their definition changed. This attribute has always one of the following values while the vehicle is in the network: None (also used after the return to the original route after having parked), Driving to parking space, Waiting for free parking space (only when standing close to the reserved parking space, not during the drive from the decision to that position), Parking (only inside the parking space, during the randomly determined dwell time), Blocked while leaving parking space, back to route, Parking request declined. The attribute value is calculated at the end of the time step, i.e. it already includes a new routing state if the vehicle has passed a parking routing decision affecting it. (In contrast, formula decisions always use the values from after the previous time step.)

There are many new calculated attributes in vehicles:

- Number of parkings: Number of times that the vehicle has started a dwell time on a parking space since the start of the simulation run.
- Parking duration (current space): Time spent parking in the current parking space, empty if not currently parking.
- Parking duration (total): Total time spent parking in any parking spaces since the start of the simulation run.
- Waiting duration for free parking space (current): Time spent waiting close to the reserved parking space, empty if not currently waiting.
- Waiting duration for free parking space (total): Total time spent waiting close to a reserved parking space since the start of the simulation run.
- Blocked duration leaving parking space (current): Time spent at least partially inside a parking space which has been used for parking while being blocked from leaving by other vehicles (or signals), empty if not currently in this situation.
- Blocked duration leaving parking space (total): Total time spent at least partially inside a parking space which has been used for parking while being blocked from leaving by other vehicles (or signals), since the start of the simulation run.
- Parking fee (total): Total accumulated parking fee since the start of the simulation run.

## 1.1.2 Parking Spaces

Parking spaces have several result attributes now:

- Number of vehicles parked: During a time interval: Number of vehicles currently parking in the parking space (1 or 0). After the end of the time interval: Number of vehicles parking in the parking space at the end of the time interval (1 or 0).
- Number of vehicles entering: Number of vehicles which have started parking in the parking space during the time interval.
- Number of vehicles leaving: Number of vehicles which have finished parking in the parking space during the time interval.
- Occupancy duration (total): Total time spent by vehicles parking in the parking space during the time interval.
- Parking duration (minimum): Shortest individual parking time of a vehicle which has finished parking in the parking space during the time interval.
- Parking duration (maximum): Longest individual parking time of a vehicle which has finished parking in the parking space during the time interval.
- Parking duration (average): Average individual parking time of all vehicles which have finished parking in the parking space during the time interval.
- Occupancy rate: Occupancy duration divided by the length of the time interval (respectively by the time elapsed since the start of the interval if during the interval), i.e. percentage of the time interval when the parking space was used by parking vehicles.
- Parking space blocked duration (total): Total time spent by vehicles waiting to leave the parking space after having finished parking.
- Parking space blocked rate: Parking space blocked duration divided by the length of the time interval (during the interval: as above), i.e. percentage of the time interval when a vehicle was blocked from leaving.
- Parking fee (total): Total parking fee accumulated by vehicles in the parking space during the time interval.

Result attributes of parking spaces can be shown in the coupled list Parking Lots / Parking Spaces and can be used for color schemes in the graphic parameters for parking lots.

## 1.1.3 Parking Lots

Parking lots have the same new result attributes as parking spaces. The values are the logical aggregation of the values for the individual parking spaces, with a vehicle using multiple parking spaces being counted as only one vehicle for "number of vehicles" but for several parking spaces for "occupancy" and possibly "blockage" attributes.

### 1.1.4 Parking Lot Groups

These new network objects can be defined in their own list, to be opened via Lists / Private Transport / Parking Lot Groups, or in the coupled list Parking Lots / Evaluation Groups. Each parking lot group references any number of parking lots and allows to collect aggregated results for those. Each parking lot has a new relation "Evaluation groups" referencing all parking lot groups that the parking lot belongs to. The parking lot attribute "Group" used for Dynamic Assignment has been renamed to "Destination group".

Parking lot groups have the same new result attributes as parking lots. The values are the logical aggregation of the values for the individual parking lots.

Result attributes of parking lot groups can be shown in the coupled list Parking Lots / Evaluation Groups and in the list Parking Lot Groups, and they can be used for color schemes in the graphics parameters for parking lots.

### 1.1.5 Parking Routing Decisions

Parking routing decisions have several result attributes now:

- Number of parking requests: Total number of vehicles from affected classes which have passed the decision during the time interval and wanted to park due to the parking rate. This includes declined requests due to insufficient room.
- Number of parking requests declined: Total number of vehicles from affected classes which have passed the decision during the time interval and wanted to park due to the parking rate but could not park due to insufficient room.
- Number of parking requests accepted: Total number of vehicles from affected classes which have passed the decision during the time interval and were assigned a parking space.
- Parking requests declined share: Number of parking requests declined divided by the number of parking requests, i.e. the percentage of eligible vehicle which could not park due to insufficient room.

Result attributes of parking routing decisions can be shown in the list Parking Routing Decisions.

## 1.2 Formula Routes

A formula used for a route can now access both attributes of the route and attributes of the vehicle through the temporary relations ROUTE respectively VEHICLE, e.g. [ROUTE\UDA1] or [VEHICLE\SPEED].

## 2 Pedestrian Simulation

### 2.1 Formula Routes

A formula used for a route can now access both attributes of the route and attributes of the pedestrian through the temporary relations ROUTE respectively PREDESTRIAN, e.g. [ROUTE\UDA1] or [PEDESTRIAN\SPEED].

### 2.2 RSET

The grid cell evaluation has the new result attribute "Required Safe Egress Time" ("RSET"). This attribute contains the latest simulation time in the time interval when at least one pedestrian was inside that grid cell. It can be used for color schemes for pedestrian areas, ramps and stairs.

### 2.3 BIM Import

Stairs with one of the geometry types TwoStraightRunStair, QuarterWindingStair, QuarterTurnStair, HalfWindingStair, HalfTurnStair, TwoQuarterWindingStair or TwoQuarterTurnStair can now be imported from \*.ifc files.

### 2.4 CAD Import

The import for pedestrian areas supports the \*.dwg 2020 format now. Units in \*.dwg files are now also imported and the polygons are scaled accordingly.



## 3 Visualization

### 3.1 Live 3D Buildings

Live 3D buildings (from MapTiler) are now automatically hidden if their footprint overlaps with the footprint of a static 3D object. In addition, specific live buildings can be hidden by selecting them in the new special editor mode "Edit building visibility" which can be entered through the context menu of the network editor in 3D mode. For the selection of live buildings, single left mouse-click (optionally with Ctrl for toggling without changing the rest of the current selection) and rectangular rubberband (ditto) are available. All selected buildings can then be made visible or invisible, according to the checkbox in the flyout toolbar. (The automatic hiding when overlapping cannot be overridden.)

### 3.2 Parking Evaluation Data

The results of the new evaluations for parking lots, parking lot groups, parking spaces and parking routing decisions can be visualized in multiple ways.

#### 3.2.1 Color Schemes for Parking Lots

The color scheme in the graphics parameters for parking lots can be selected to be used per parking space, parking lot, or parking lot group:

**Edit Color Scheme for Parking Lots**

Classification based on: ☒ ParkingSpace ☐ Parking Lots ☐ Parking Lot groups

Color for undefined value:

Classification by color:

Class bounds and colors:

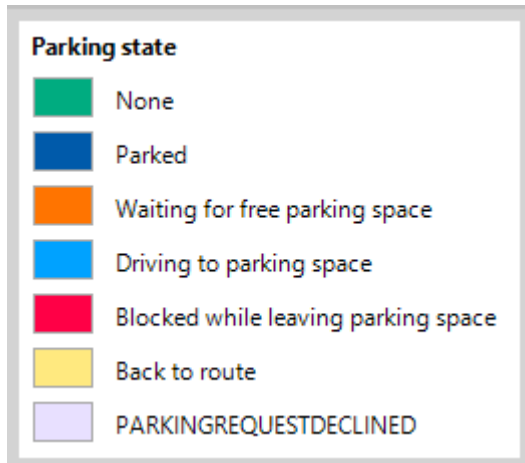
Count	LowerBound	UpperBound	Color	Name
1	MIN	10.000	(255, 255, ...)	
2	10.000	20.000	(255, 255, ...)	
3	20.000	30.000	(255, 255, ...)	
4	30.000	40.000	(255, 255, ...)	
5	40.000	50.000	(255, 255, ...)	
6	50.000	60.000	(255, 198, ...)	
7	60.000	70.000	(255, 128, ...)	
8	70.000	80.000	(255, 0, 25, ...)	
9	80.000	90.000	(255, 0, 18, ...)	
10	90.000	100.000	(255, 0, 12, ...)	
11	100.000	MAX	(255, 255, ...)	

Range scale factor:

If "Parking Space" is selected, each individual parking space is colored according to its individual attribute value. If "parking lot groups" is selected, all parking lots of a group have the same color, representing the group's attribute value.

### 3.2.2 Vehicle Color for Parking State

In the graphic parameters for vehicles in the network, there is the new drawing mode option "Color by parking state".



## 4 Handling

### 4.1 GUI for Simple ITS

Network objects required for controllers of the new types can now be added even more comfortably in the network editor: ...

### 4.2 Attribute Selection Dialog

Up to 5 previously selected attributes are now offered for selection in an additional drop-down box. Attributes which have been selected most recently within the last hour are shown with the highest priority and then (over the course of two weeks) eventually replaced with more often selected attributes.

The search filter considers sub-attributes now as well as relations. The character '\' separates the corresponding levels.

### 4.3 Named Color Schemes

User-defined color schemes can now be named and added to the list of predefined color schemes in the color scheme dialog. They can also be selected, renamed, overwritten and deleted there. Named color schemes are saved in the layout file and can be read additionally from any layout file into the current layout data.

### 4.4 Context Menu Key

The context menu key on the keyboard (usually to the left of the right Ctrl key) opens the context menu for the selected network object(s) now in the network editor, *not necessarily* the object(s) at the current position of the mouse pointer.

## 5 Other

### 5.1 Attribute Modifications

The "Scripts" menu has been renamed to "Actions" because a second type of triggered actions has been added to the data model. An attribute modification sets a specified attribute of all objects of a specified type to a value calculated by a specified formula.

The attribute modification is executed at the specified time(s): before or after the start or end of the simulation run or at the start or end of each time step (optionally every x simulation seconds and/or limited to a certain time span).

The formula can reference the same attribute, as well as other attributes of the respective object or – through the function `TableLookup()` – of other objects. This allows to add up a total value from values of several time steps without requiring any scripting.

### 5.2 Recording in Multirun

Storyboards and Animation Recordings have the new attribute "Recording scope" with the possible values "every run" (default), "first run only" and "final run only" which can be set to define in which simulation run(s) out of a multirun the respective files are to be recorded.

### 5.3 ANM Import

The ANM import can now handle vehicle class specific desired speeds (e.g. exported from Visum as speed per TSys).

## 6 Technical Changes

### 6.1 CodeMeter Runtime

The CodeMeter Runtime deployed with PTV Vissim has been updated to CodeMeter 7.0.

### 6.2 Python

PTV Vissim 2021 is the last release supporting Python 2.7 for scripts in addition to Python 3.x. Future releases will only support Python 3.x. Custom scripts will need to be adjusted to Python 3.x in order to sustain compatibility with future releases.

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