

NEW IN PTV VISUM 17

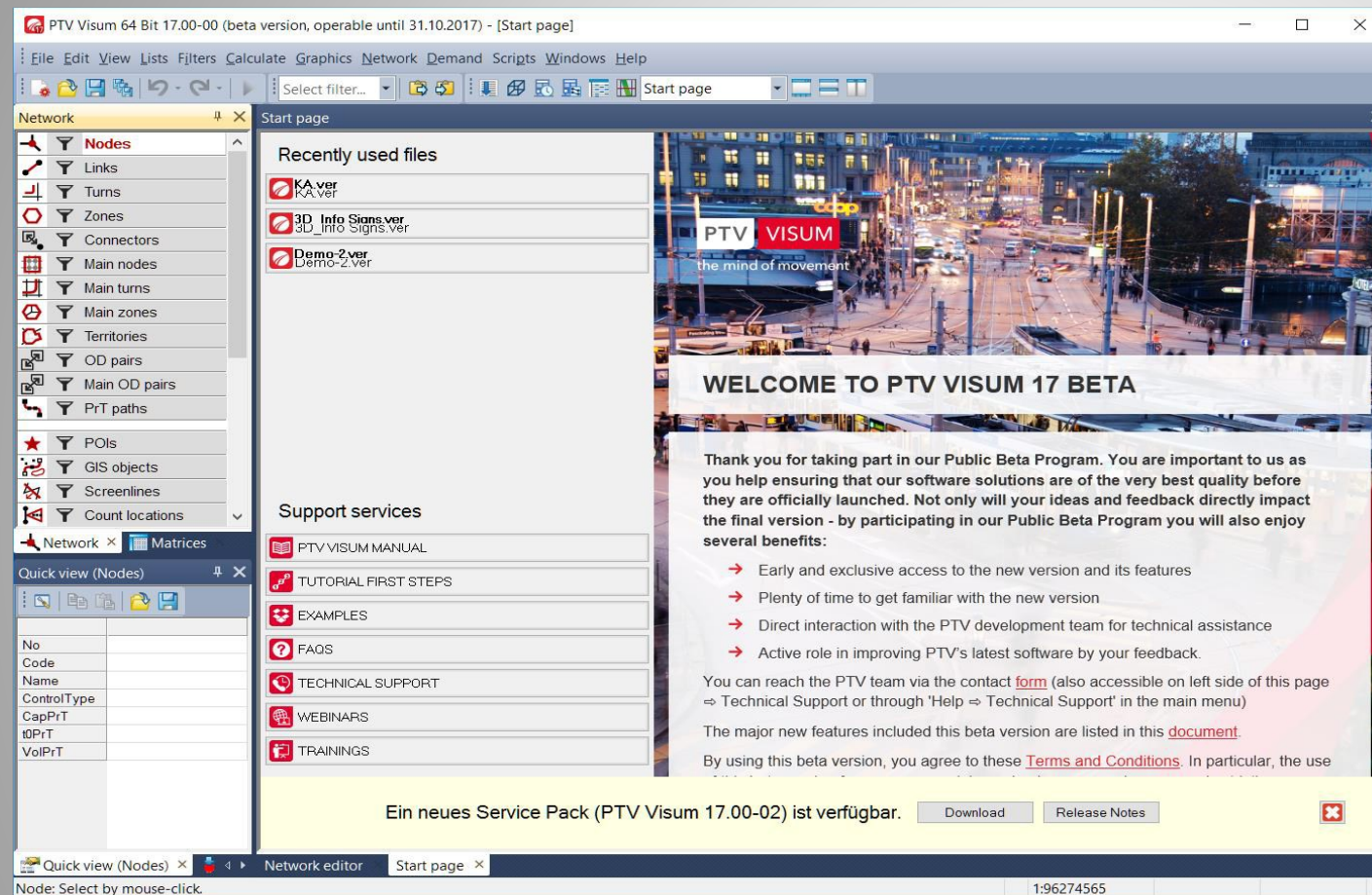
PTV VISUM – DEVELOPMENT 2012 - 2016

	2012	2013	2014	2015	2016
Graphical user interface/ GIS	<ul style="list-style-type: none"> Window redesign Transfers display Schematic line diagram 	<ul style="list-style-type: none"> Formula editor 	<ul style="list-style-type: none"> Distributed computing Multi-user mode Redesign of the timetable editor 	<ul style="list-style-type: none"> Improved display of isochrones New functions in the formula editor 	<ul style="list-style-type: none"> Visum 3D Synchronization
Private transport	<ul style="list-style-type: none"> Multi-threading of LUCE 	<ul style="list-style-type: none"> Improved Assignment with ICA 		<ul style="list-style-type: none"> Stochastic assignment for bicycles with path level costs 	<ul style="list-style-type: none"> Simulation-based dynamic assignment (SBA)
Public transport	<ul style="list-style-type: none"> Capacity restriction in the timetable-based assignment Fares for the headway-based assignment 	<ul style="list-style-type: none"> Reporting Add-In Import transit supply 	<ul style="list-style-type: none"> Skim matrix calculation for stop areas Arrival time-based demand 	<ul style="list-style-type: none"> Couplings Passenger trip chains 	<ul style="list-style-type: none"> PuT assignment with "Optimal strategies" Check-in/ Check out data support
Demand modeling	<ul style="list-style-type: none"> Add-In Nested Demand Model 	<ul style="list-style-type: none"> Formula matrices 	<ul style="list-style-type: none"> Tour-based "Rubberbanding" Matrix references 	<ul style="list-style-type: none"> Tour-based freight model Park & Ride 	<ul style="list-style-type: none"> Built-in Nested demand model
Miscellaneous	<ul style="list-style-type: none"> OSM Import Live Background maps 	<ul style="list-style-type: none"> One step Vissim export Visum Safety 	<ul style="list-style-type: none"> Import PuT supply from Visum 	<ul style="list-style-type: none"> GPX Import GTF Export 	<ul style="list-style-type: none"> Accessibility

Speed

User friendliness

PTV VISION START PAGE



Local content

Dynamic HTML page

Central access point to recently used files, help channels and product-specific news

- HTML page is hosted in PTV
- Product send request containing: **Product, language and region.**
- Page with according content is provided to product.
- User is notified, when new service packs are available

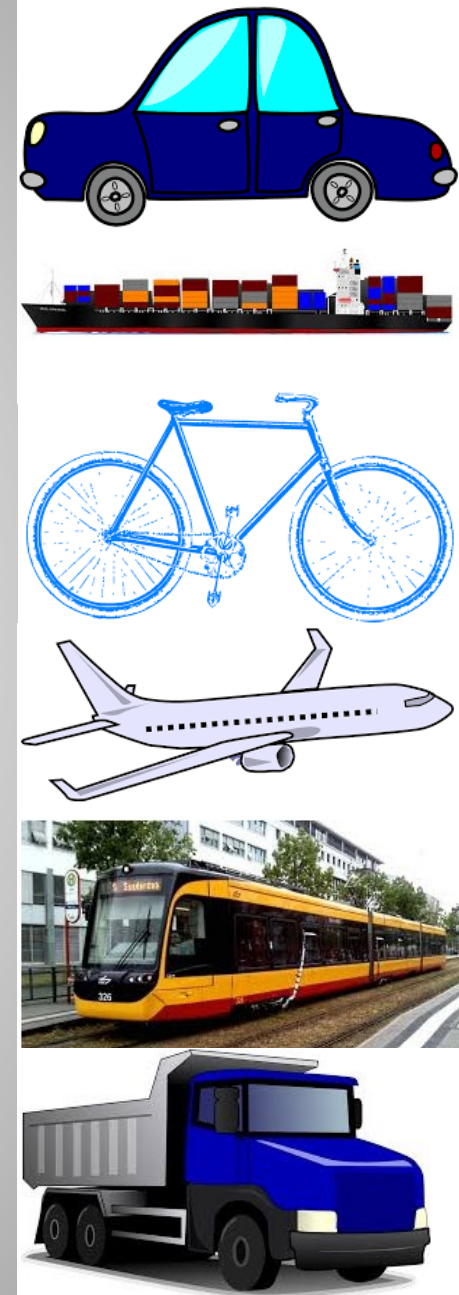
MULTIMODALE APPLICATIONS

Motivation

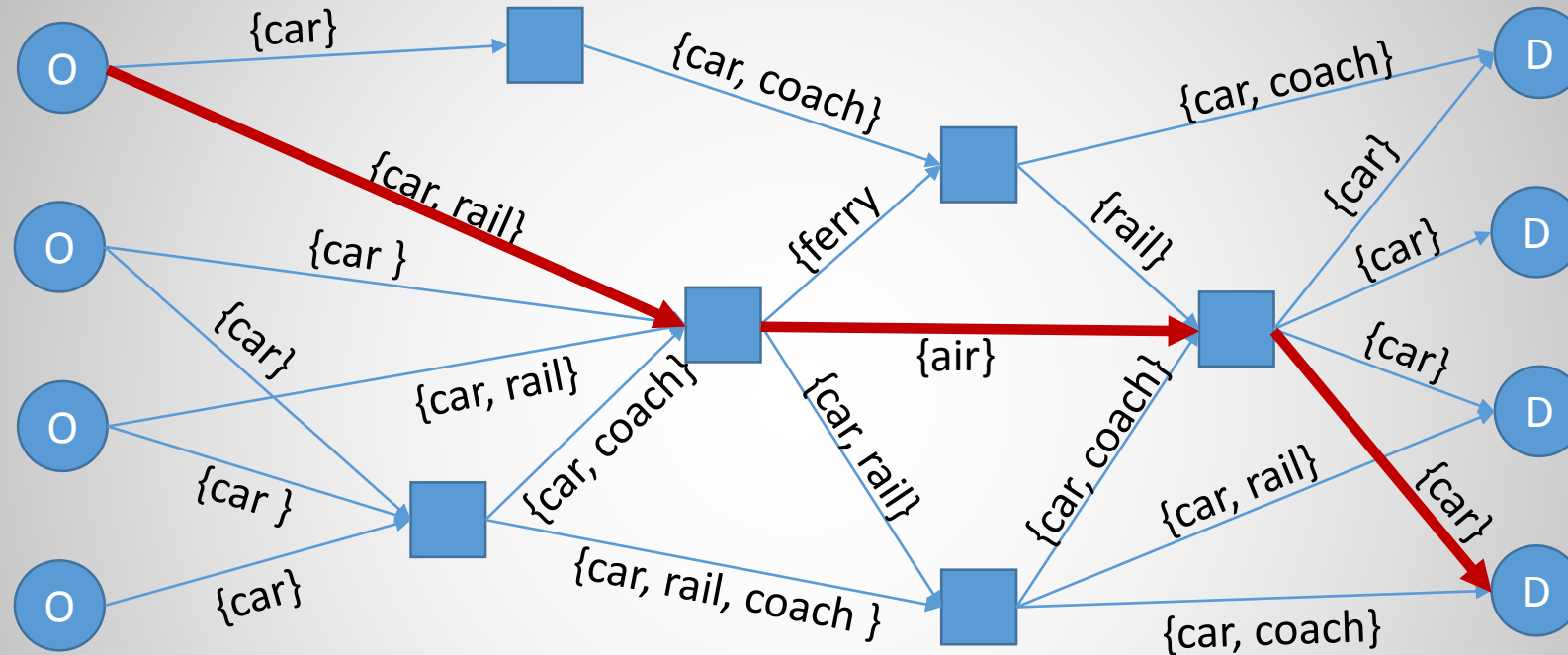
- regional and national demand models
- modeling of long-distance passenger demand
- modeling of long-distance freight transport
- modelling of bicycle carriage
- display of P+R entire paths from origins to destinations
- display of tours and paths from ABM models

Examples for existing modelling options with several modes

- P+R in demand models
- PrT as PuT auxiliary in public transport assignments



NETWORK GRAPH AND PATH SEQUENCES

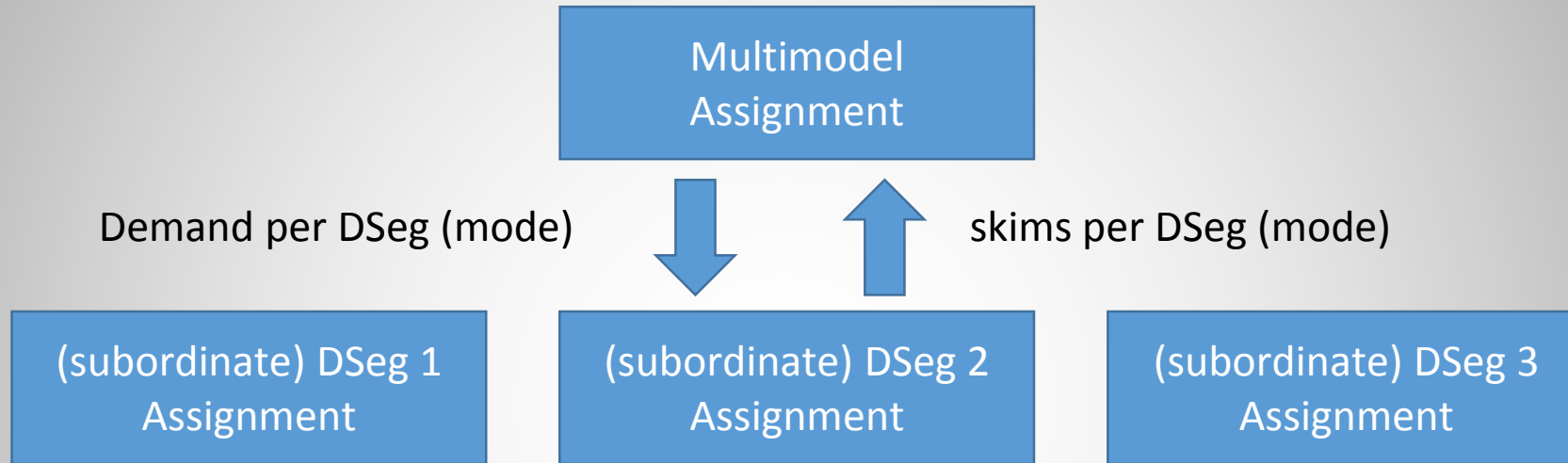


O Origin/Destination zone
 zones with mode change

{ car, rail, coach } : allowed modes for OD pair

: possible path sequence for main mode {air}

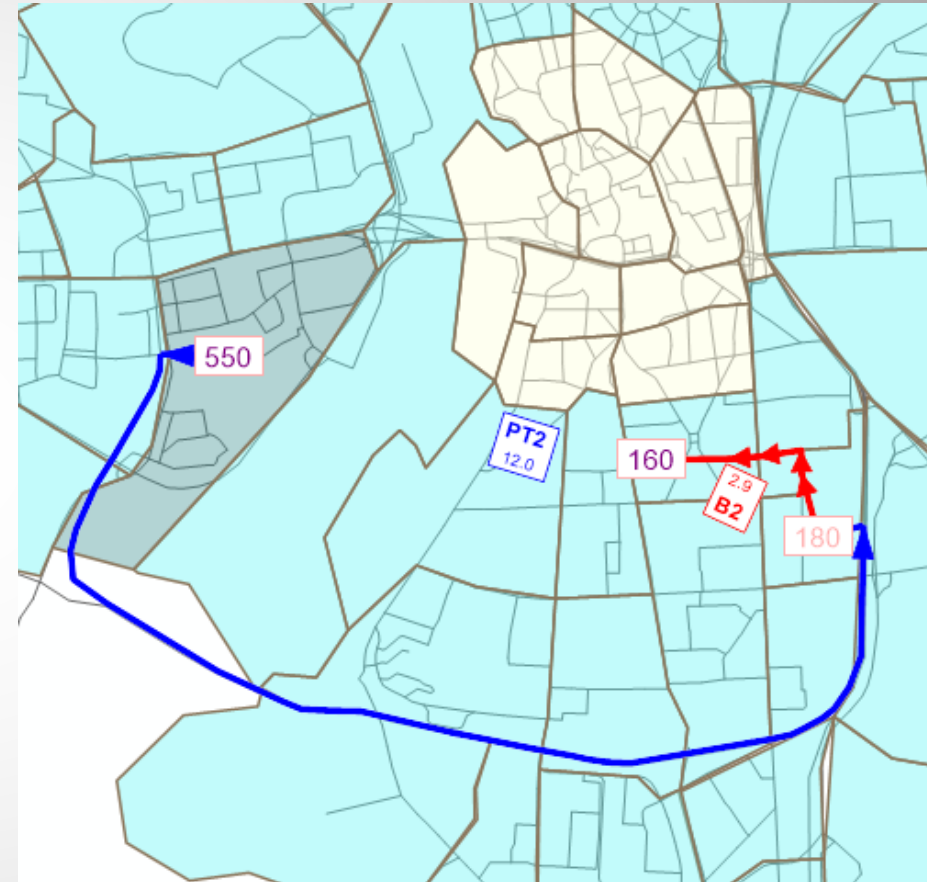
MULTIMODAL ASSIGNMENT – BASIC CONCEPT



-
1. Calculation of skim matrices (mode-specific)
 2. Multimodal assignment
 3. Calculation of skim matrices (multimodal)
 4. Calculation of new OD matrices (mode-specific)
 5. Assignment of demand segments (mode-specific)

EXAMPLE: BIKE ON TRAM AND LRT

- demand for Bike on tram/LRT
- subordinate Dsegs: main mode “PT (bike)” + “bike”
- skims path sequences: distance + time
 - distance = trip distance + ride distance
 - time = sum of t0 & ride time
- path sequence set: BT
- display of marked path sequence in the network



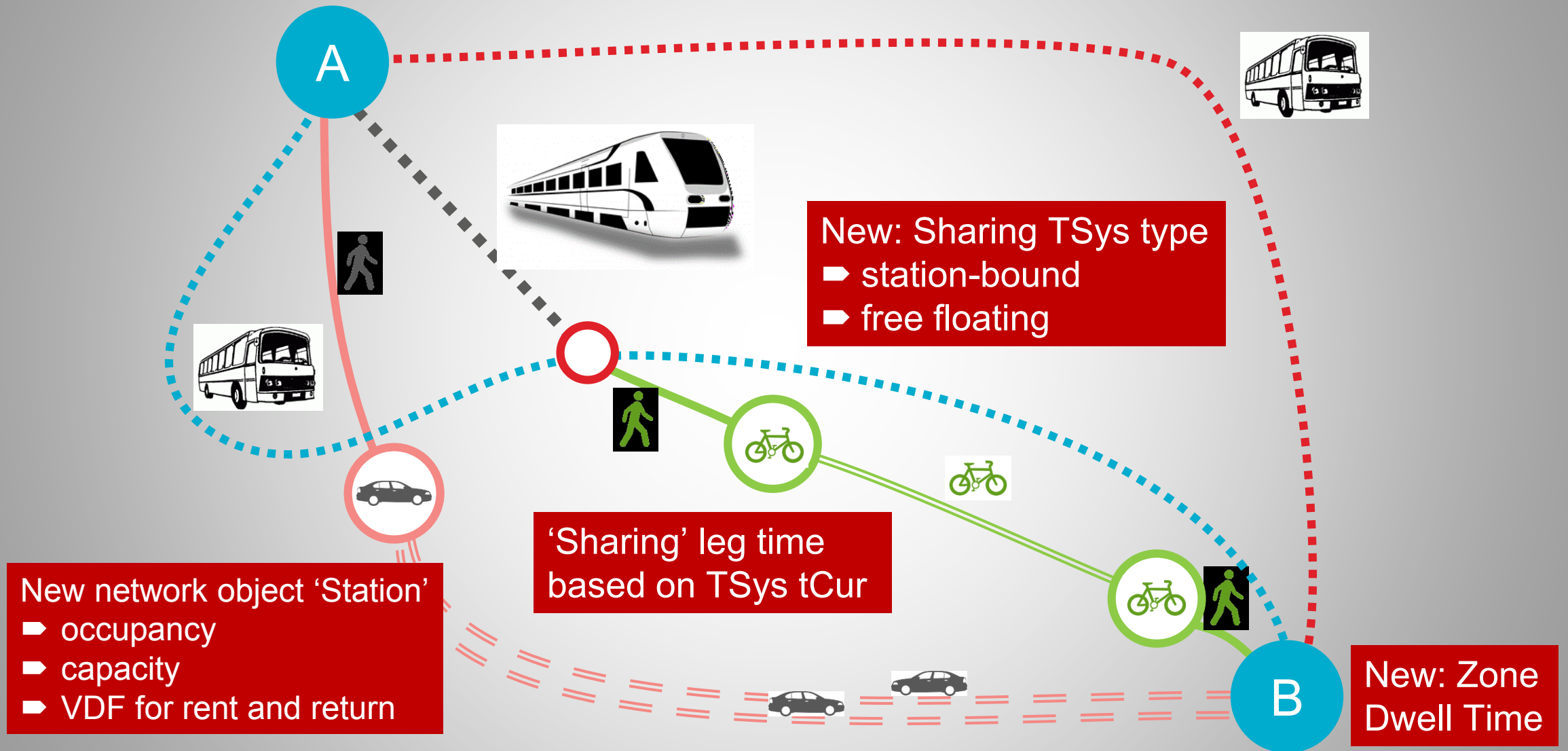
VEHICLE SHARING

Modeling and evaluation of Vehicle Sharing Systems

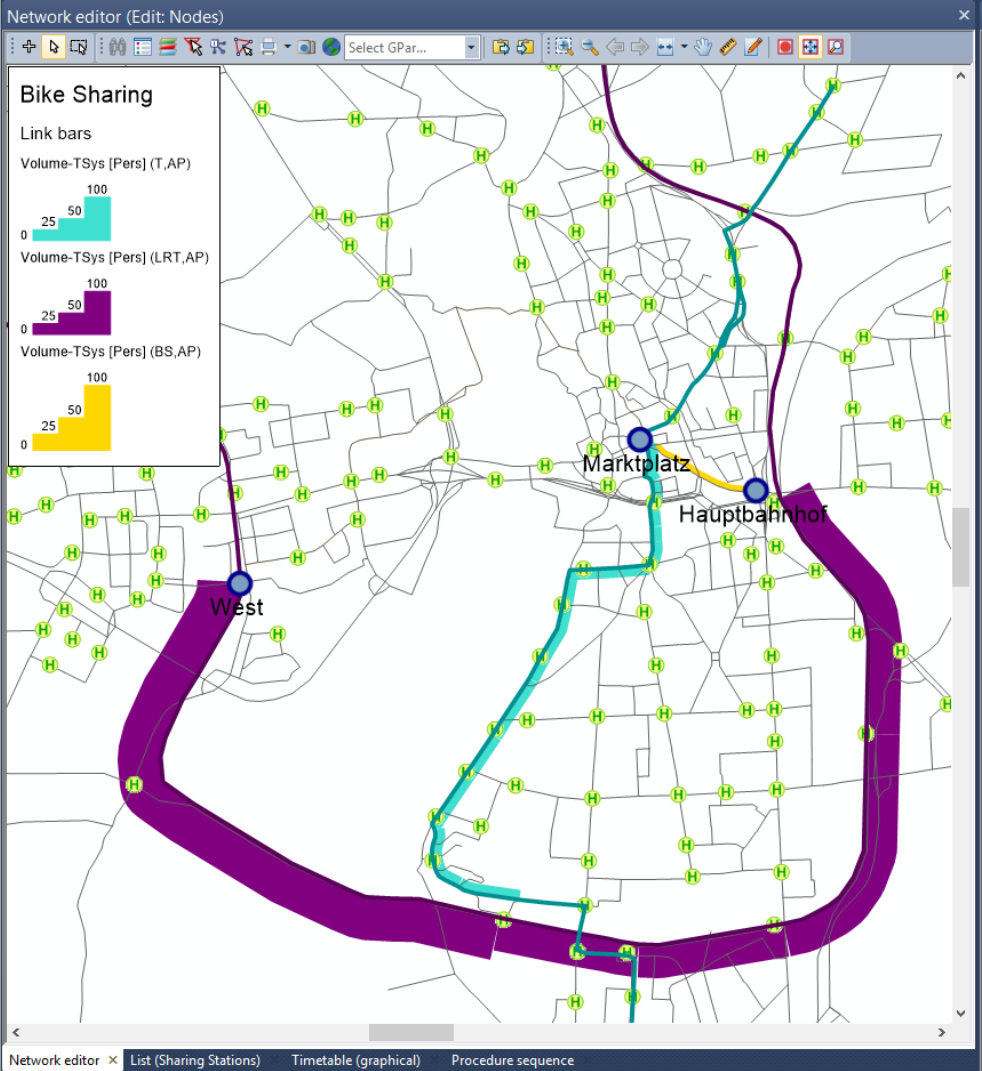
- increasing popularity of sharing systems
- modeling of sharing systems addressing city planners and operators
 - modeling the choice between PT and/or different sharing systems
 - support or competition for PT?
 - size/positioning of such systems



MODELING OF VEHICLE SHARING



RESULTS – EVERYTHING YOU KNOW FROM PUBLIC TRANSPORT

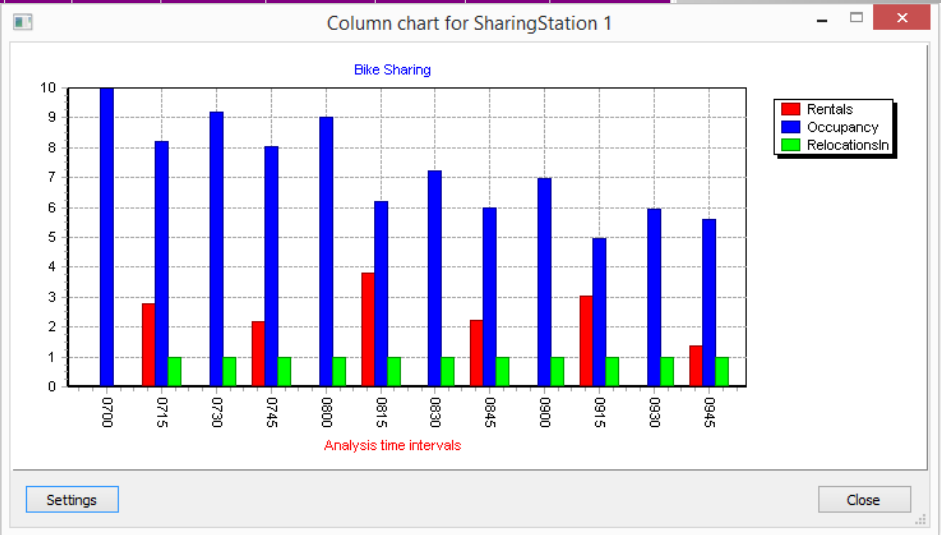


List (PuT path legs)

DSegs DSeg PT Selection All routes Origin zone filter All

Filter for path status All Only active time profiles Only PuT path legs Format Default

Count: 20	origZone	destZone	ODTrips	ERZ	Reisezeit	eProfileKeySt	Time	Dist	Fare(PT)
1	550	10	0,037	01:11:55	00:45:30		00:45:30	7,9	2,12
2						Origin conn	00:00:00	0,5	
3						Sharing BS	00:42:44	7,2	2,12
4						Destination c	00:02:46	0,2	
5	550	10	8,970	00:45:30	00:32:42		00:32:42	13,0	4,98
6						Origin conn	00:00:00	0,5	
7						SB 01 < 1	00:15:00	11,2	3,80
8						Transfer	00:02:23	0,0	
9						Sharing BS	00:12:33	1,0	1,19
10						Destination c	00:02:46	0,2	
11	550	10	68,042	00:45:10	00:40:09		00:40:09	13,0	3,80
12						Origin conn	00:00:00	0,5	
13						SB 01 < 1	00:15:00	11,2	3,80
14									
15	550	10							
16									
17									
18									
19									
20									



NEW PRT-ASSIGNMENT BI-CONJUGATE FRANK WOLFE (BFW)

- extension of the Frank Wolfe (FW) method
- better convergence
- multi-threaded



Parameters: Equilibrium assignment Bi-conjugate Frank-Wolfe

Termination condition

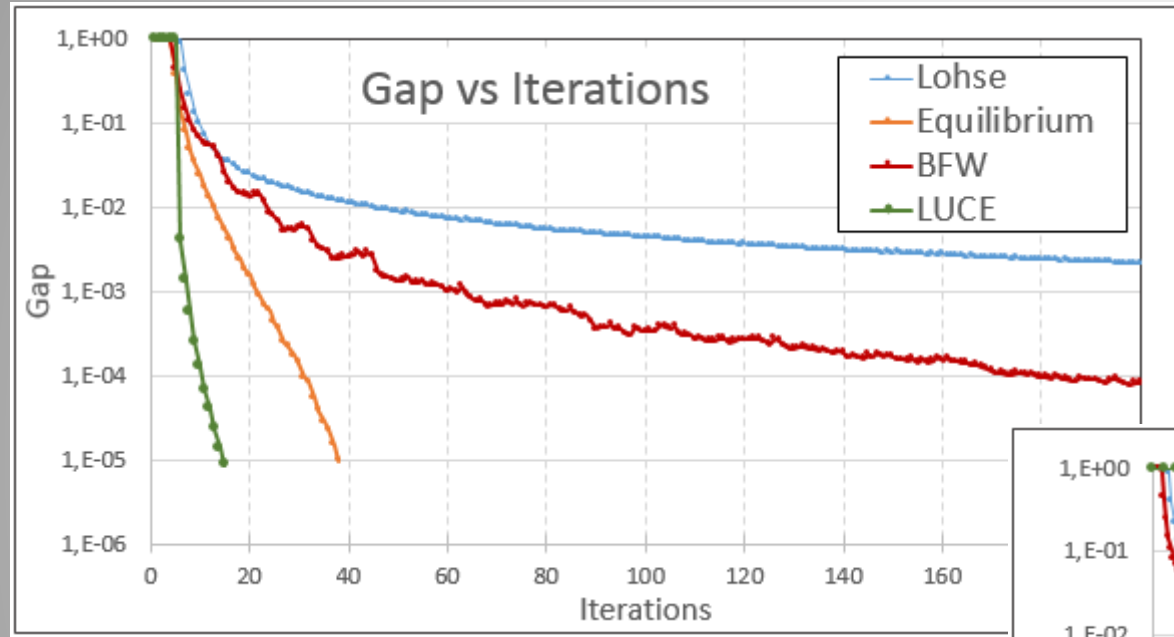
Maximum number of iterations

Maximum gap

OK Cancel

- as subordinate assignment in Assignment with ICA available

BFW IN COMPARISON TO OTHER ASSIGNMENTS



Hardware

➤ 4 cores

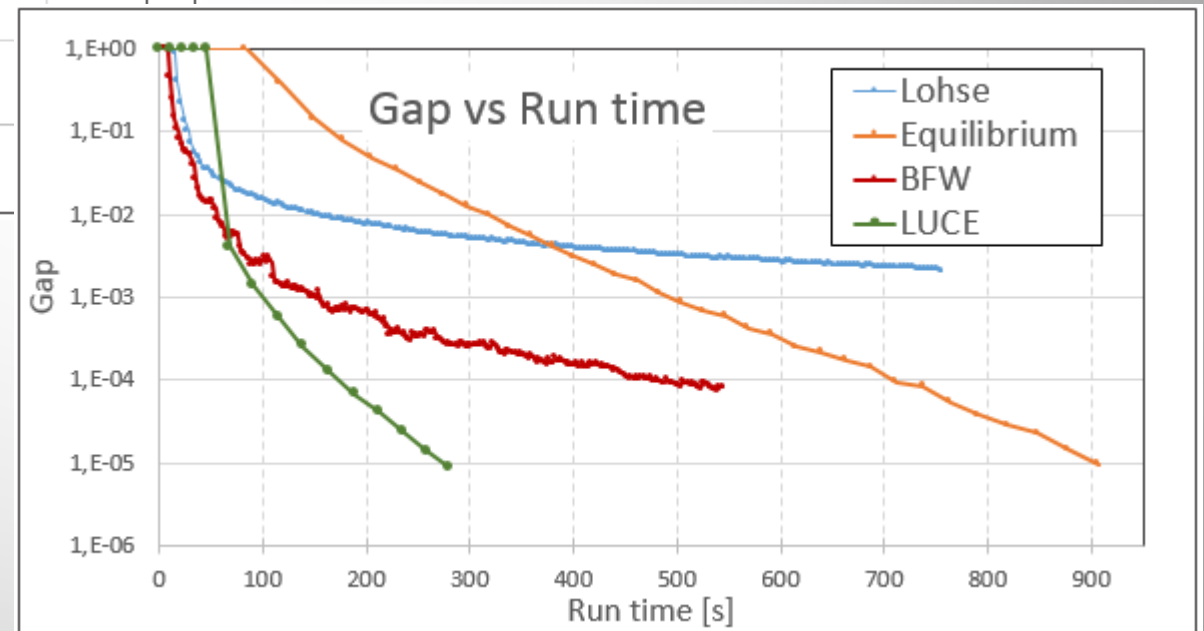
➤ @3.60GHz

Example network **Chicago**

➤ 1,800 zones

➤ 41,000 links

➤ 13,000 nodes



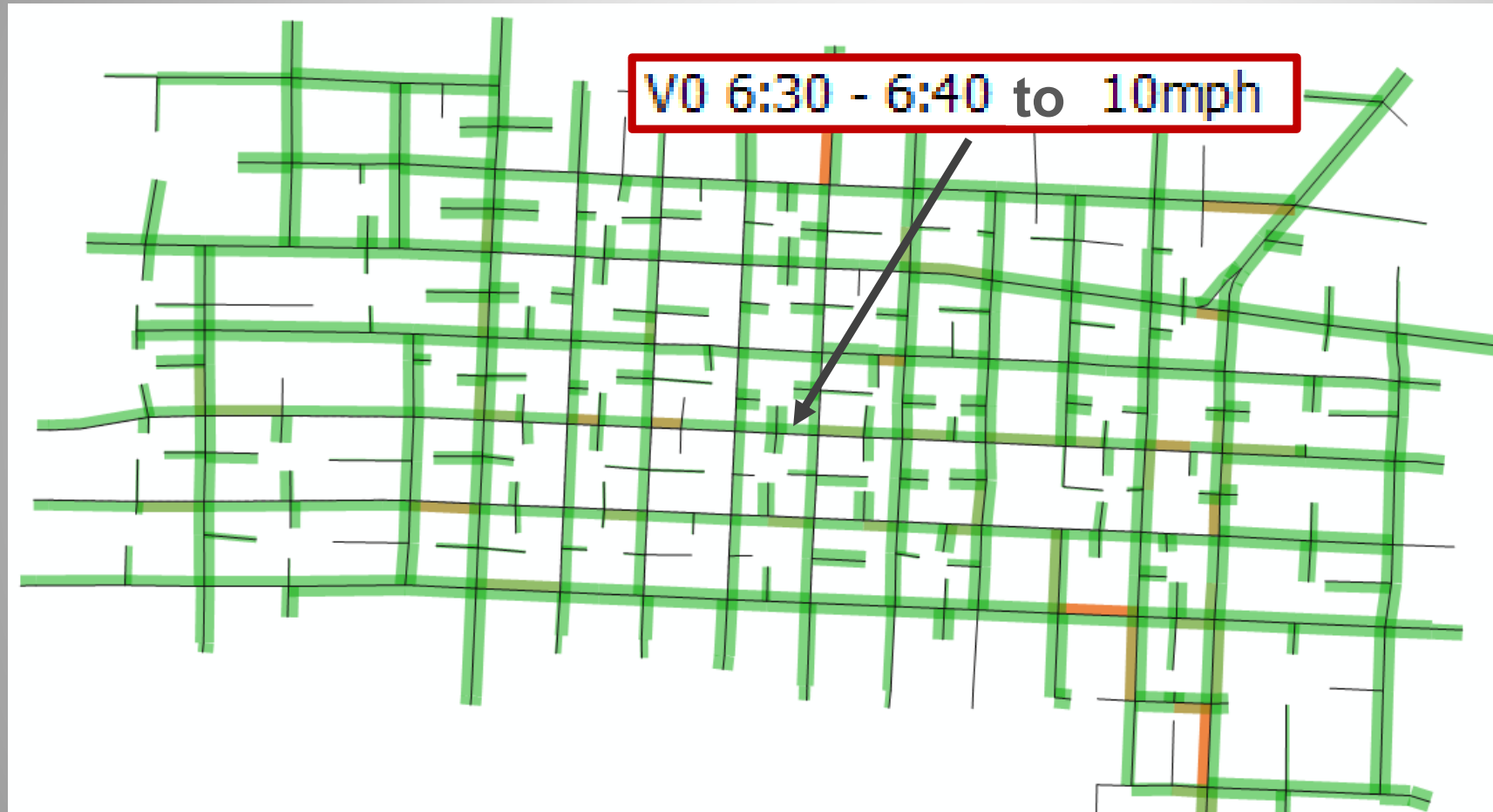
EXTENSIONS IN SBA (1)

Modeling of planned and unplanned events

- “Event”: road closure, temporary speed reduction
- unplanned: unchanged behaviour, i.e. drivers stick to their routes like in the base case, no change of route choice
- planned: adaptation of route choice until a new equilibrium state is reached



EXAMPLE: TEMPORARY SPEED REDUCTION



EXAMPLE: TEMPORARY SPEED REDUCTION



V0 6:30 - 6:40 to 10mph

Parameters: Simulation-based dynamic assignment (SBA)

Basis | Assignment time interval | Volume balancing

☒ Use current assignment result as initial solution

Iteration offset for volume balancing 10

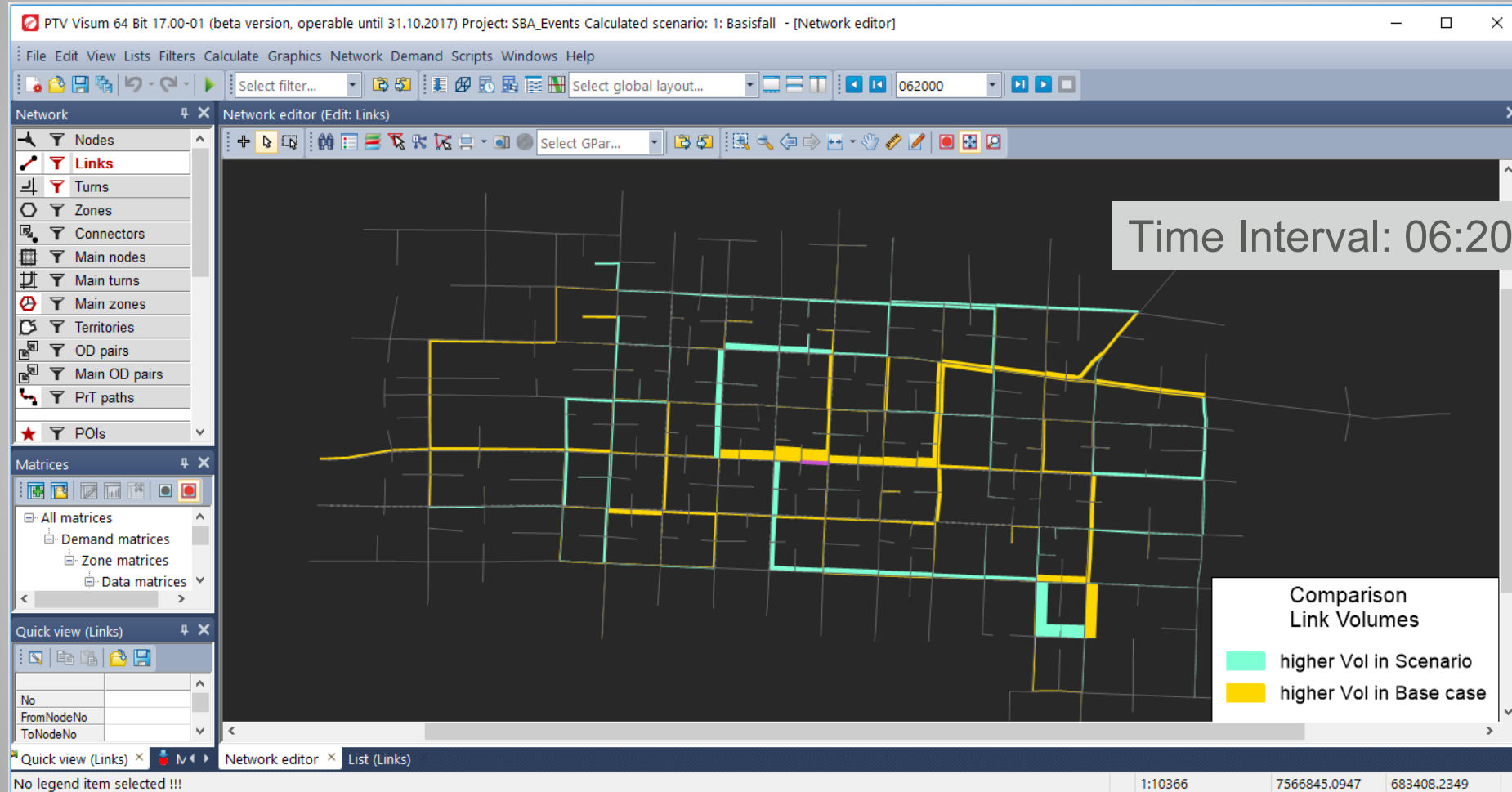
Termination condition

Maximum number of iterations 50

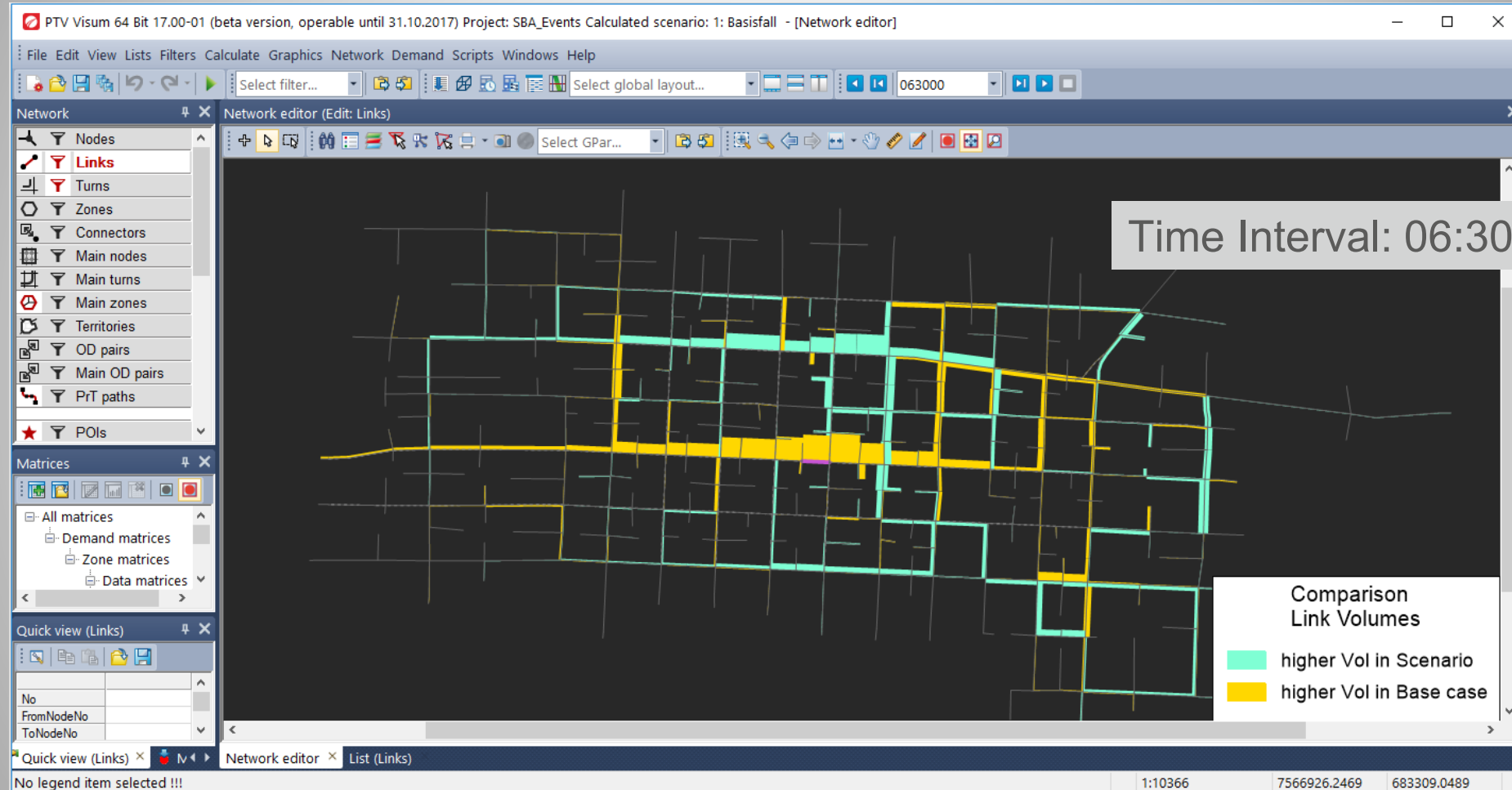
Maximum gap 0,01

Planned Event

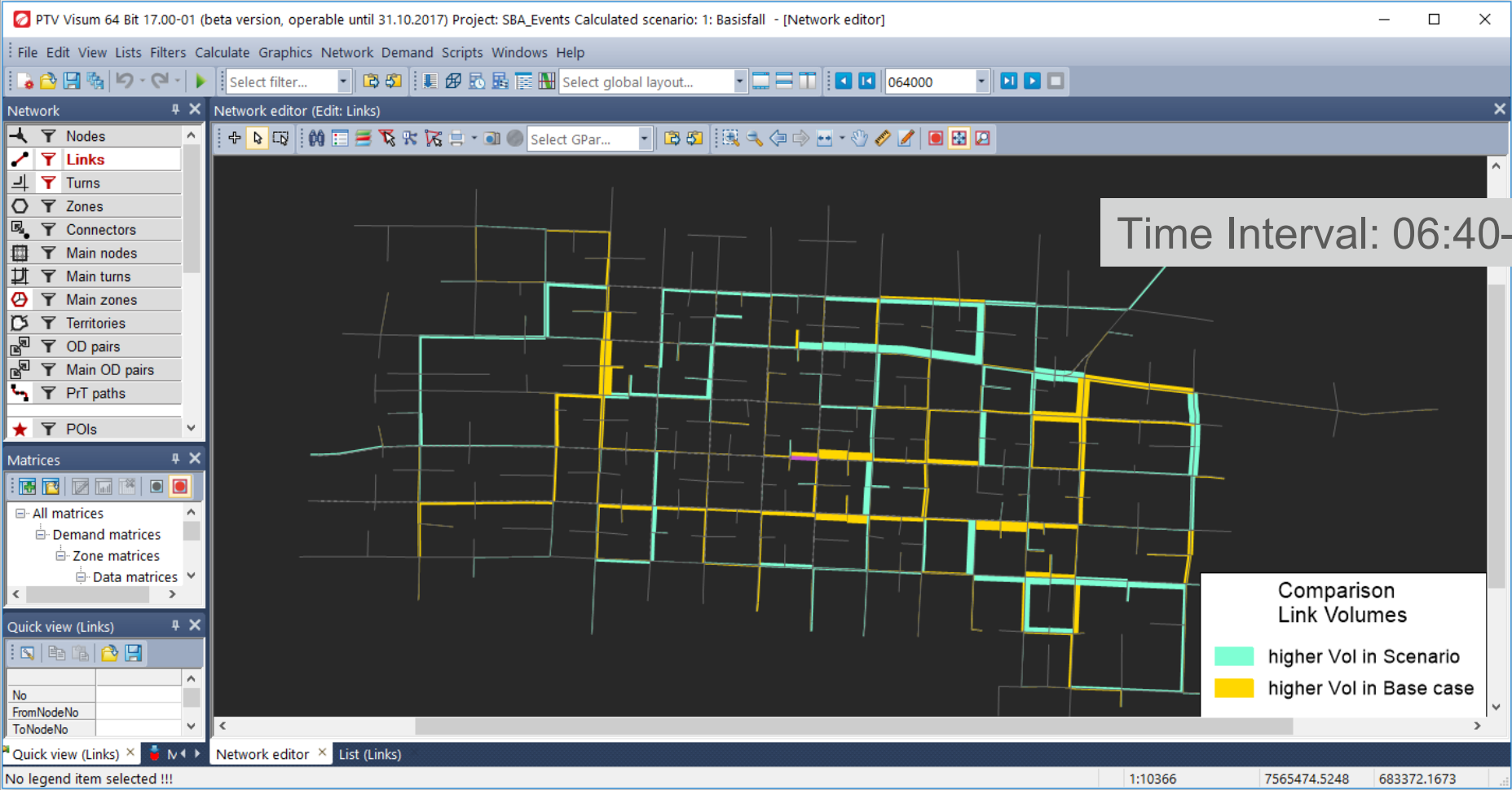
BASE CASE VS PLANNED EVENT: VOLUMES



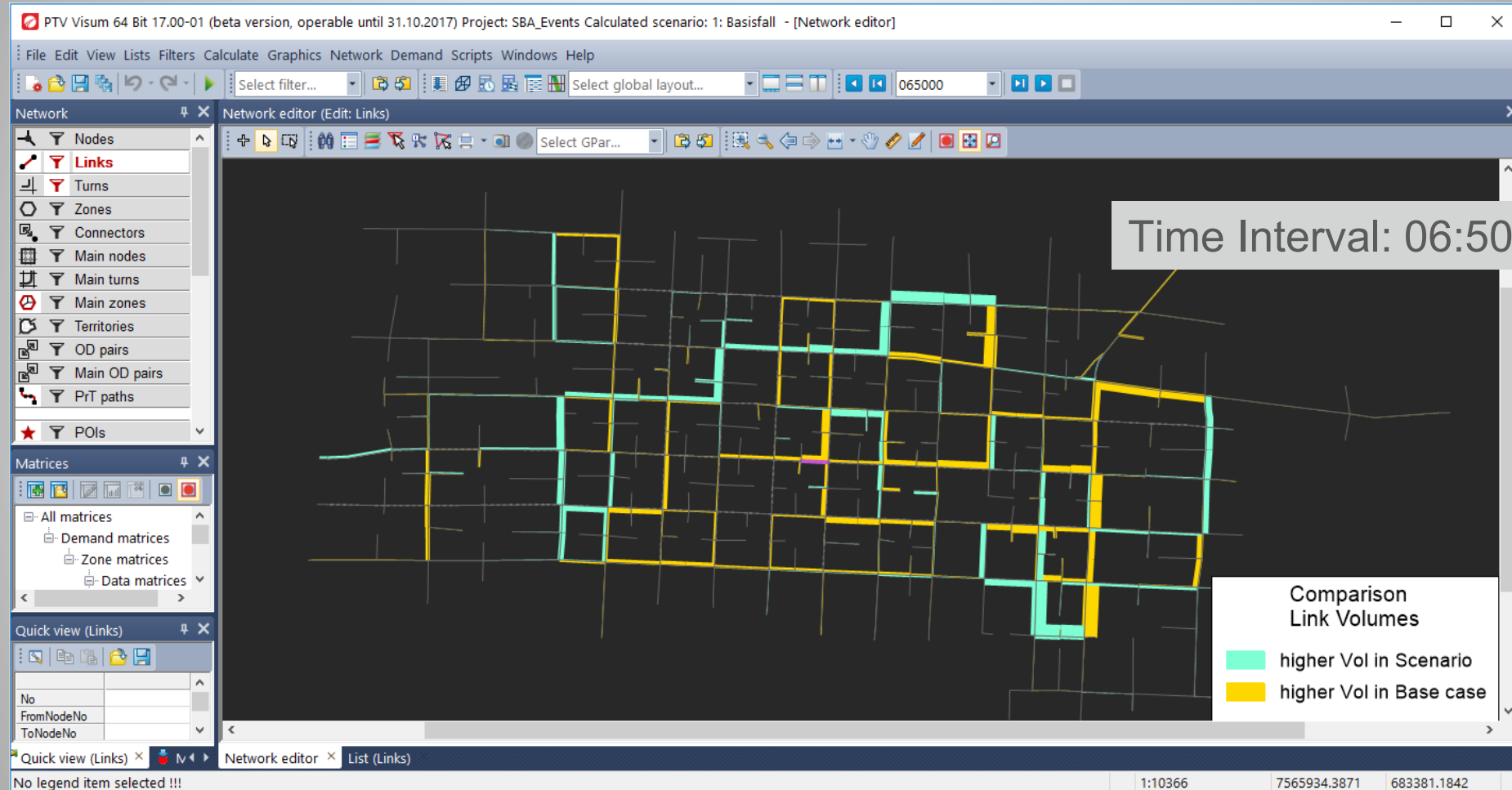
BASE CASE VS PLANNED EVENT: VOLUMES



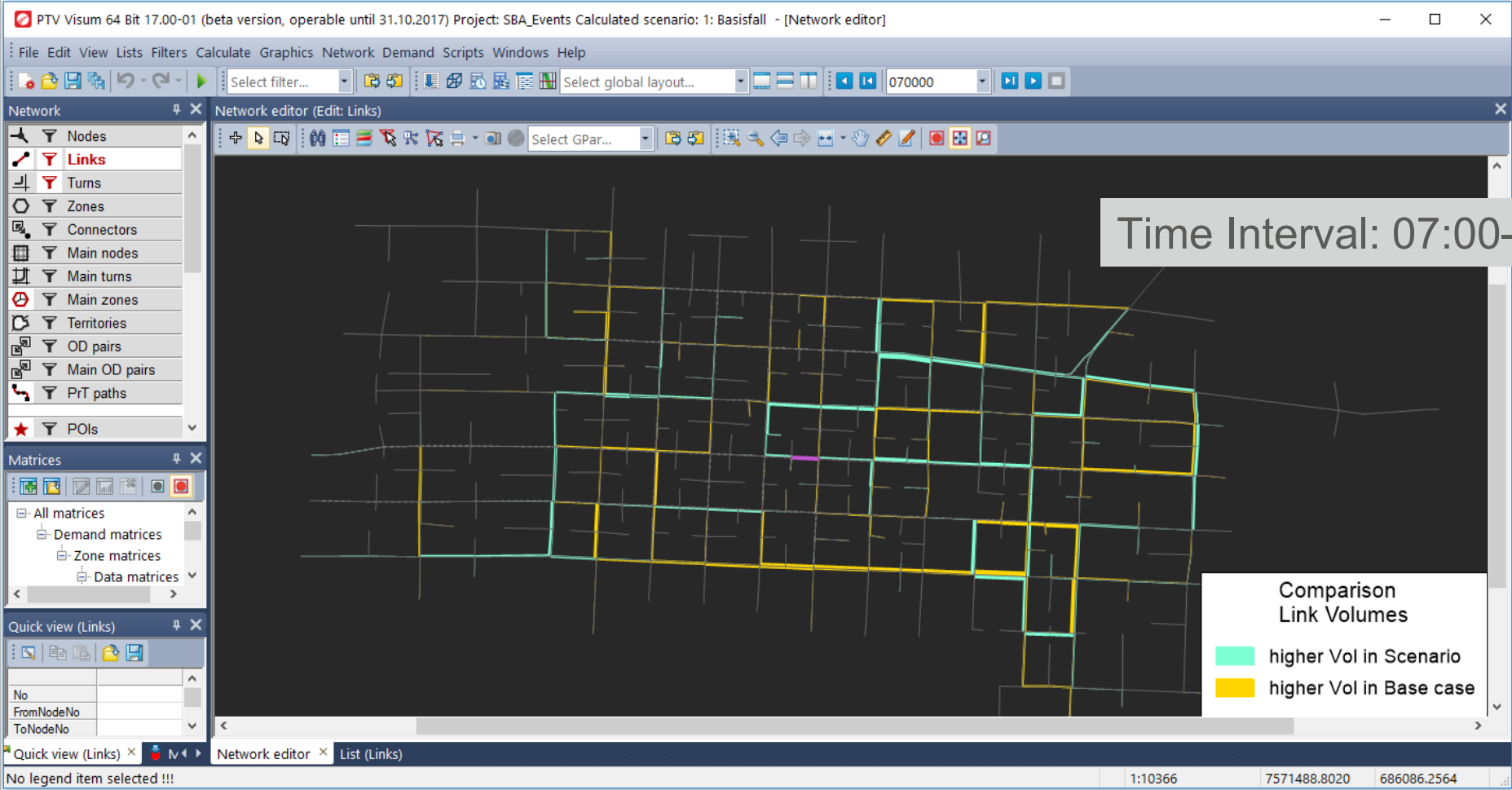
BASE CASE VS PLANNED EVENT: VOLUMES




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EXAMPLE: TEMPORARY SPEED REDUCTION



V0 6:30 - 6:40 to 10mph

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Iteration offset for volume balancing 10

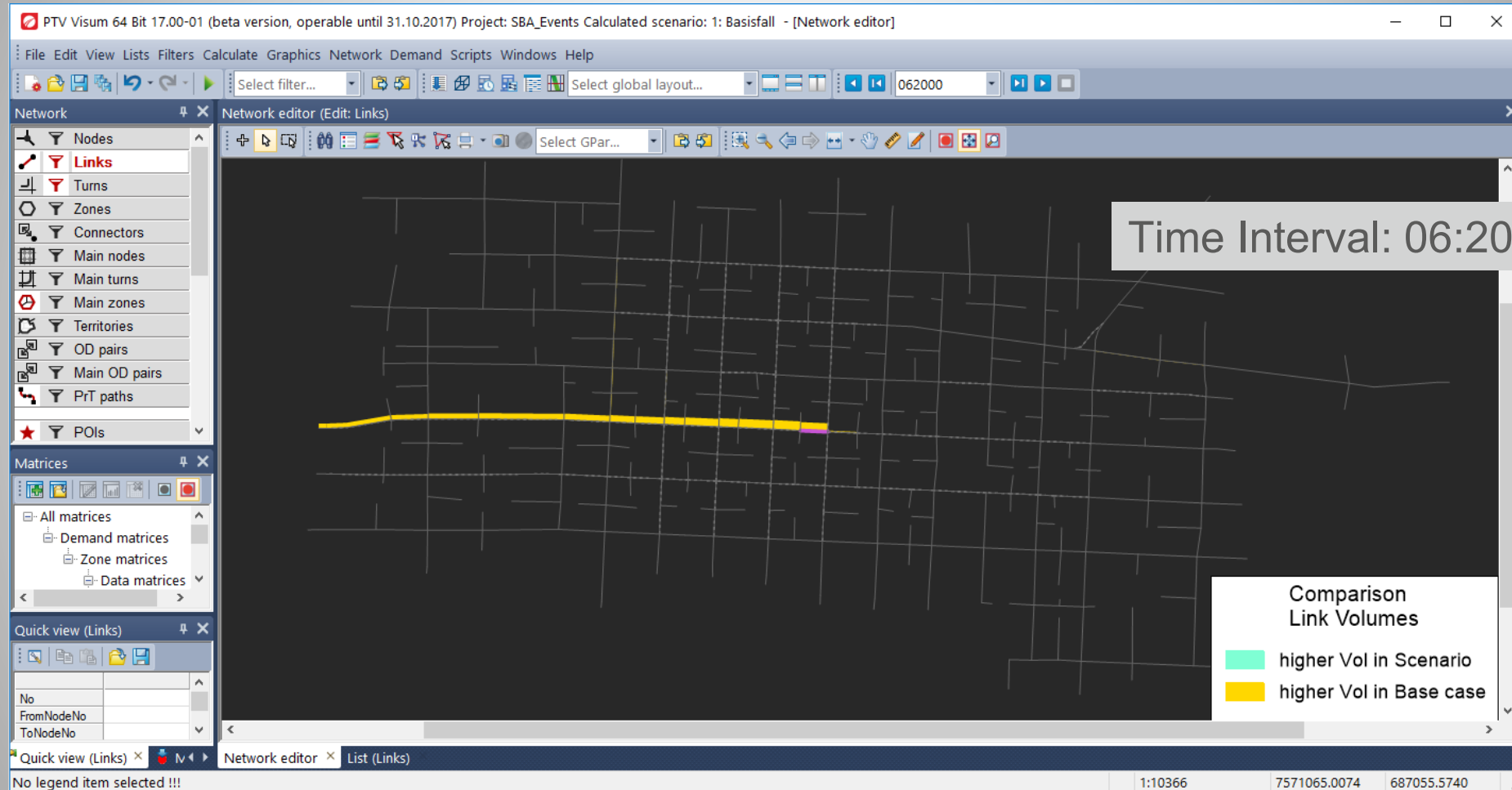
Termination condition

Maximum number of iterations 1

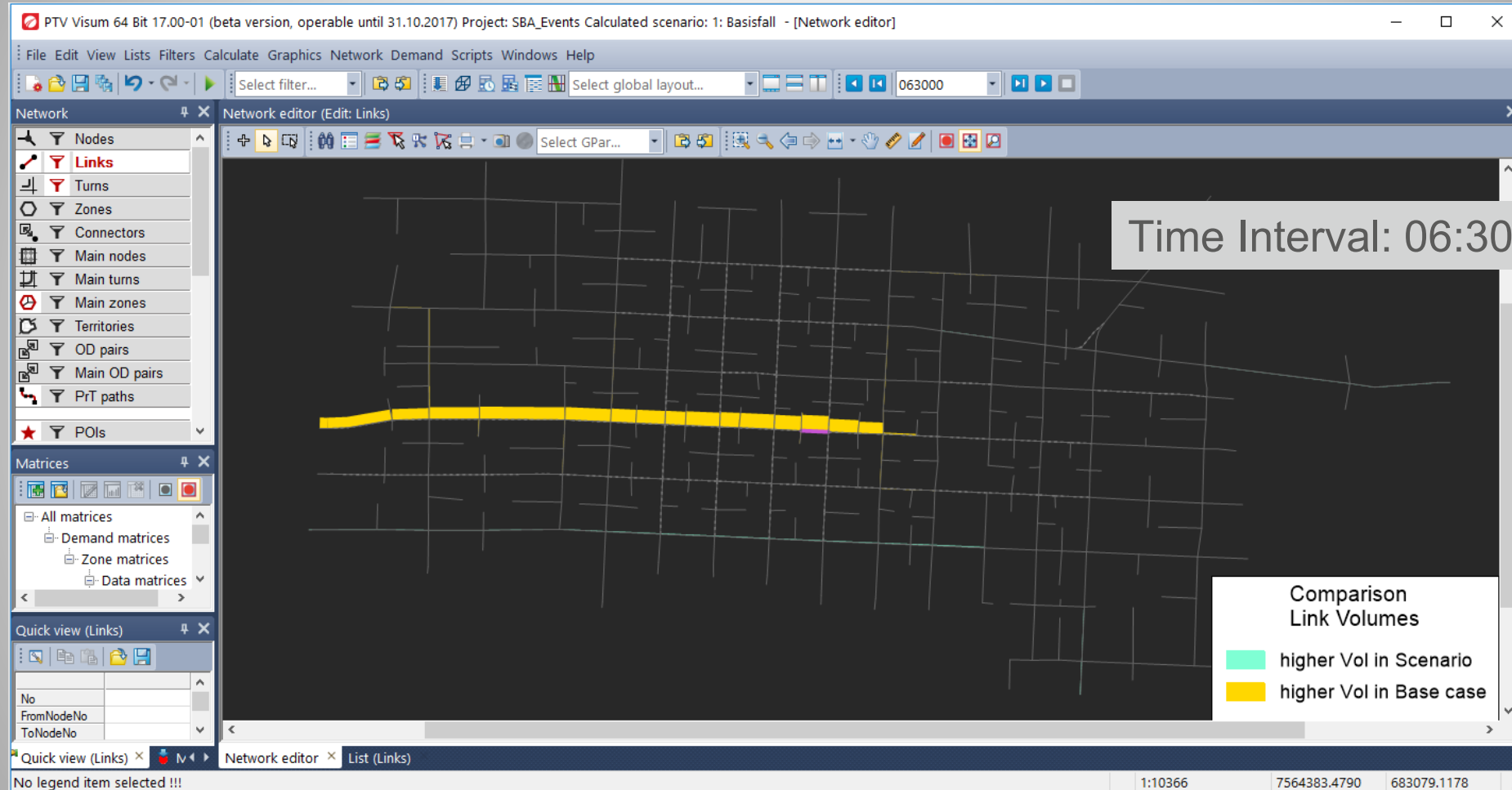
Maximum gap 0.01

Unplanned Event

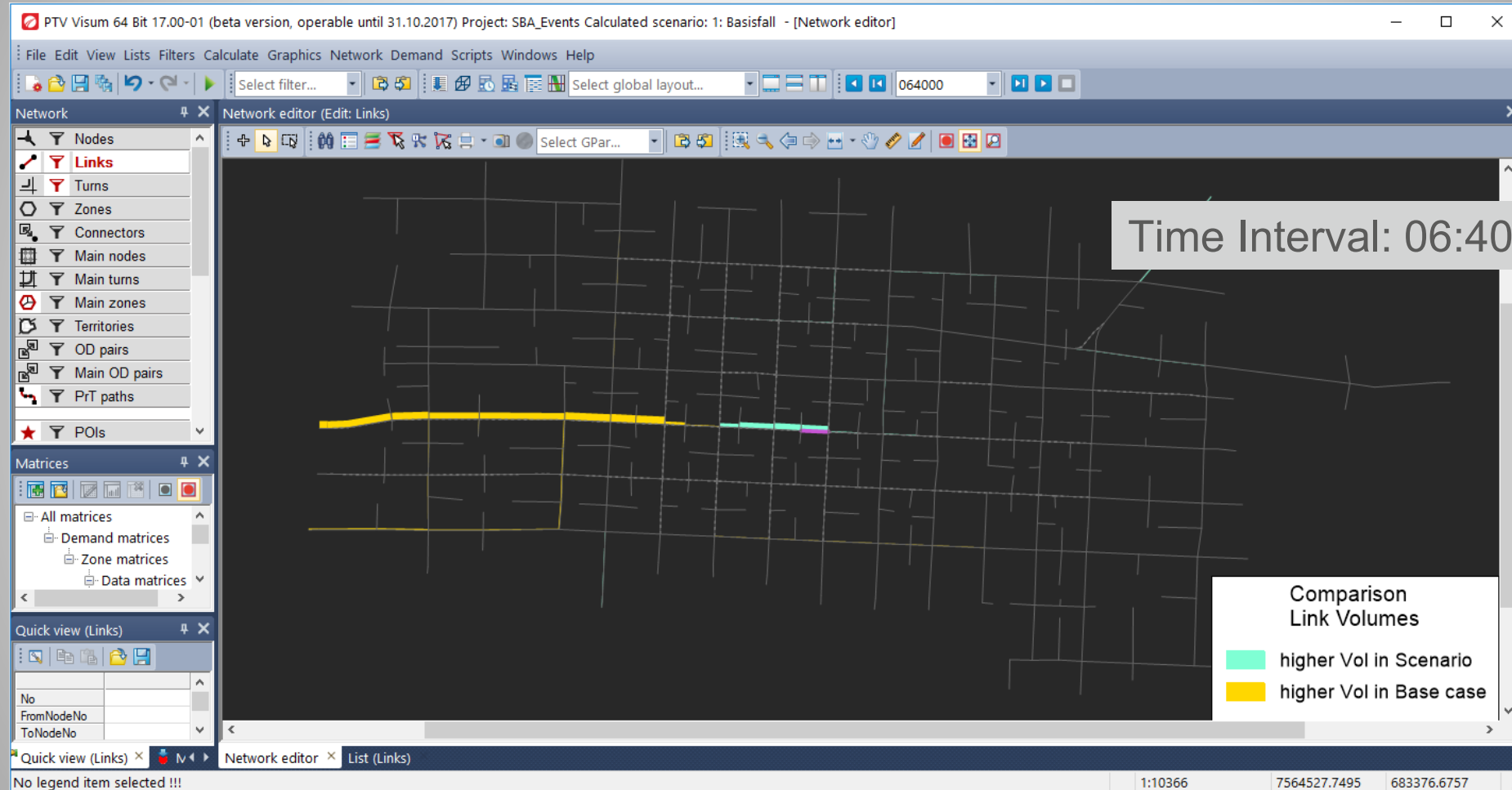
BASE CASE VS UNPLANNED EVENT: VOLUMES



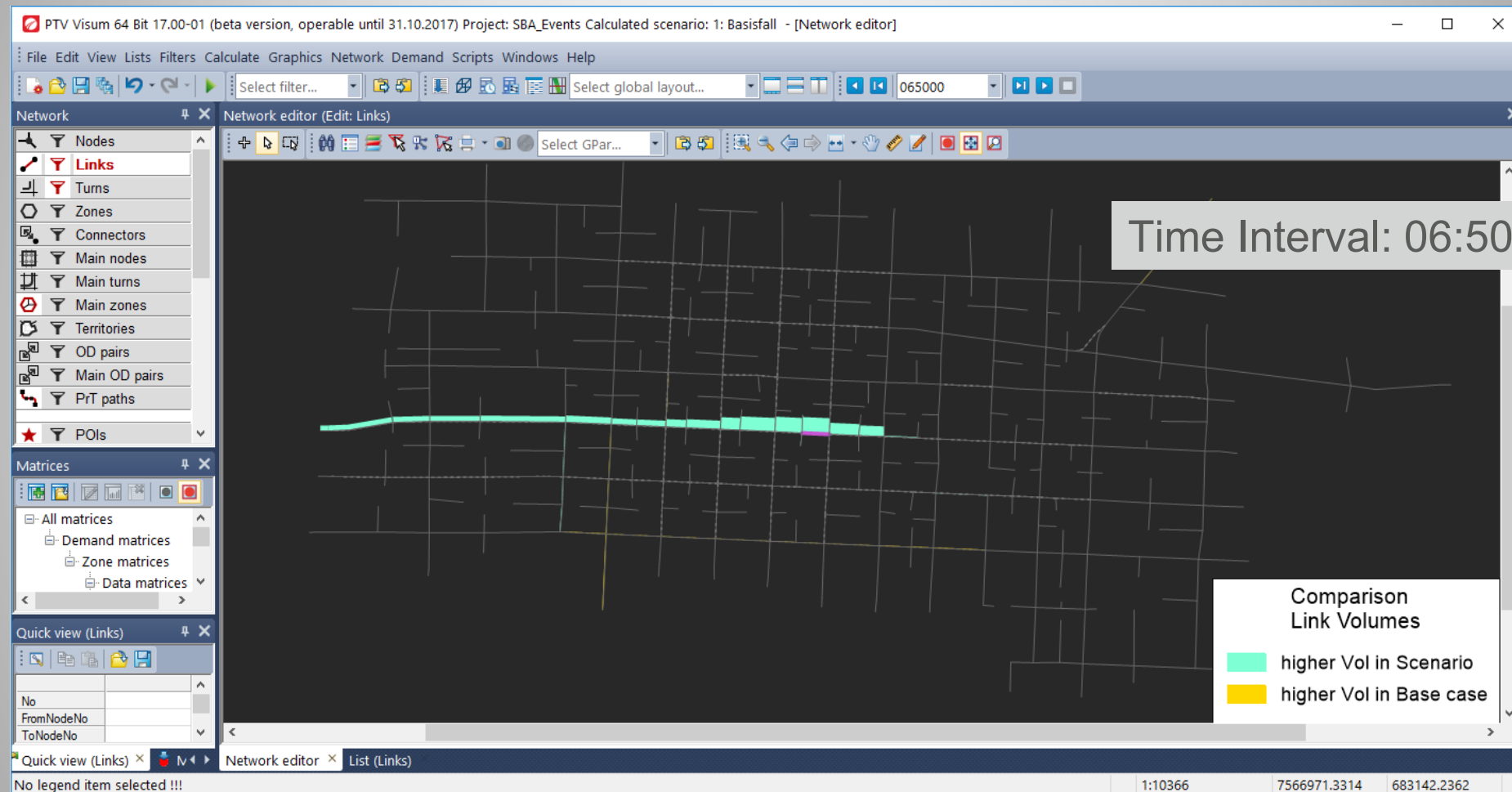
BASE CASE VS UNPLANNED EVENT: VOLUMES



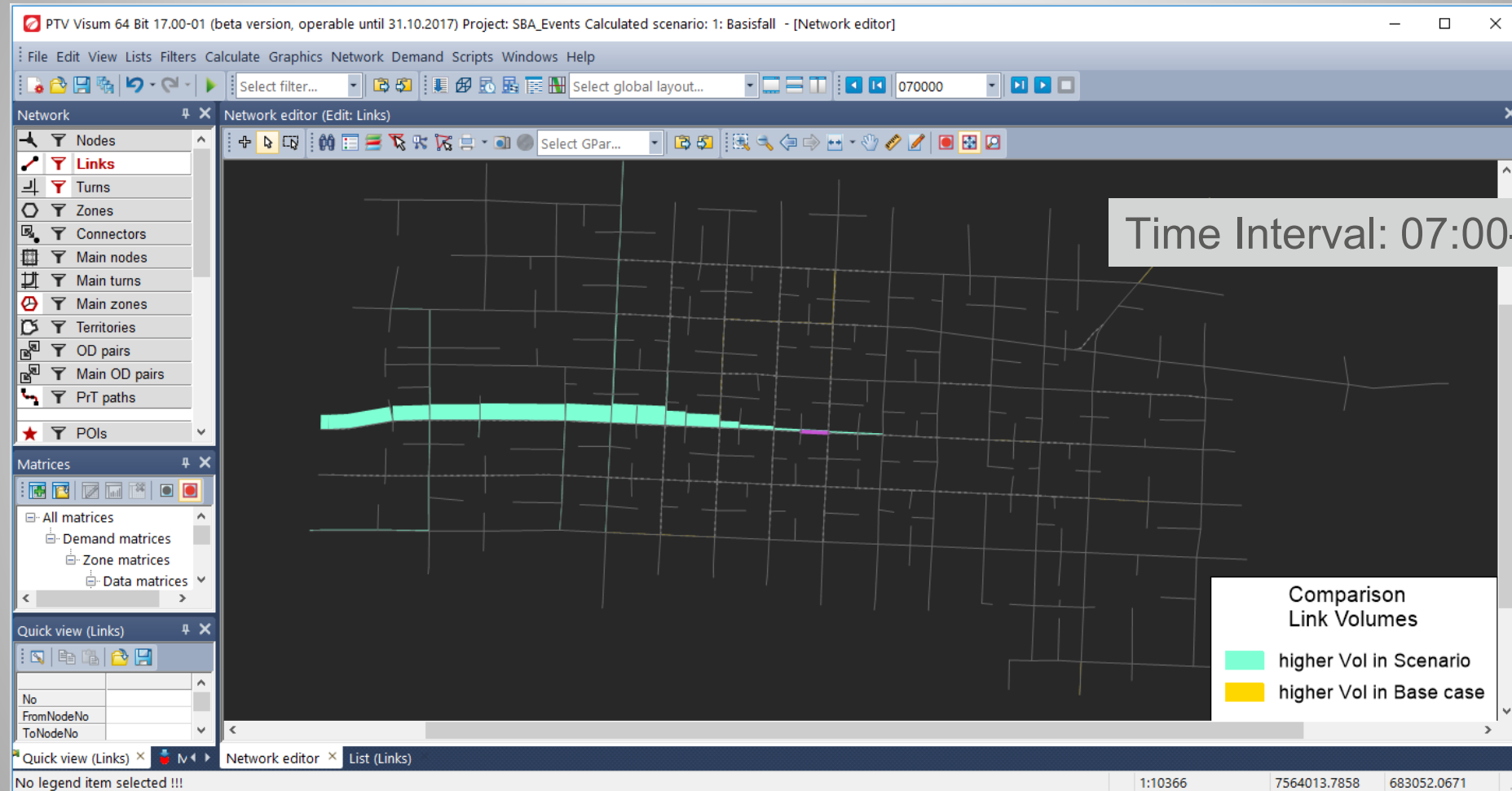
BASE CASE VS UNPLANNED EVENT: VOLUMES



BASE CASE VS UNPLANNED EVENT: VOLUMES



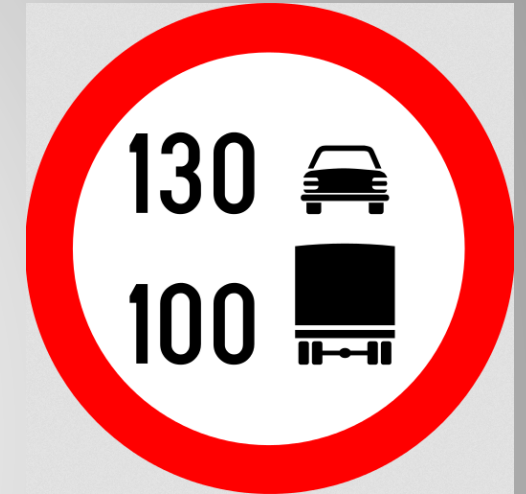
BASE CASE VS UNPLANNED EVENT: VOLUMES



EXTENSIONS SBA (2)

More realistic behavior on freeways

- ➡ speed limit for HGV lower than for car
- ➡ right (left) driving rule
- ➡ link type dependent option: Use outermost lane only by TSys



v_Car	114km/h
v_HGV	80km/h
Car	1000
HGV	1000

v_Car	115km/h
v_HGV	80km/h
Car	1000
HGV	1000



DEMAND MATRIX CORRECTION – METHOD OF LEAST SQUARES

- provides ALWAYS a solution!
- applicable to demand matrices of PrT and PuT
- Matrix correction for several demand segments in one procedure
- different counts and distributions can be combined
- tolerances are replaced by weights
- calculation of flow matrix considerably faster
- run time savings also for TFlowFuzzy
- ,Least squares' with even shorter run times as TFlowFuzzy



DEMAND MATRIX CORRECTION – PARAMETERS

Correction of demand matrix (Least squares)

Count values | Count values PrT | Distribution C | Parameters | Output

☒ Use only network objects with volume > 0 and counted value > 0

Zones

☐ Take the totals of matrix rows and columns as basis

☐ Only active zones

Row total: AddValue 1 Weight: 1.0

Column total: AddValue 2 Weight: 1.0

Links

☒ Based on counted link volumes

☒ Only active links

Volume: AddValue 1 **Weight** 1.0

Turns and main turns

☐ Based on counted turn and main turn volumes

☐ Only active turns and main turns

Volume: AddValue 1 Weight: 1.0

Screenlines

☐ Based on volumes counted in the direction of the screenline

☐ Only active screenlines

Volume: ... +/- ...

Total traffic

☐ Based on counted total traffic (all demand segments)

Total traffic: 1 Weight: 1

Procedure parameters

Ratio of weights for OD deviation relative to count weights: 0,5

Demand matrix correction (TFlowFuzzy)

Count values | Count values PrT | Distribution C | Parameters | Output

☒ Use only network objects with volume > 0 and counted value > 0

Zones

☐ Take the totals of matrix rows and columns as basis

☐ Only active zones

Row total: AddValue 1 AddValue 3

Column total: AddValue 2 +/- AddValue 3

Links

☒ Based on counted link volumes

☒ Only active links

Volume: AddValue 1 **+/-** AddValue 2

Turns and main turns

☐ Based on counted turn and main turn volumes

☐ Only active turns and main turns

Volume: AddValue 1 +/- AddValue 2

Screenlines

☐ Based on volumes counted in the direction of the screenline

☐ Only active screenlines

Volume: ... +/- ...

Total traffic

☐ Based on counted total traffic (all demand segments)

Total traffic: 1 +/- 1

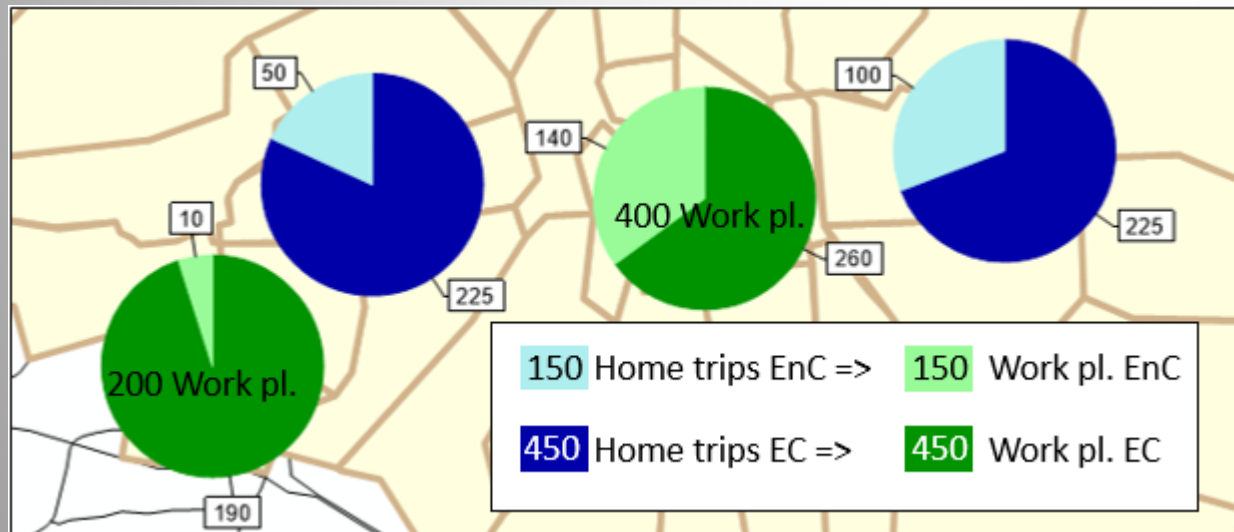
TOUR-BASED DEMAND MODEL: DISTRIBUTION ACROSS DEMAND STRATA

Objective:

Person groups with the same trip purpose compete for the same attraction potential.

Example:

- 2 person groups employees with and without car (450 pers. / 150 pers.)
- 2 locations with work places (200 / 400)

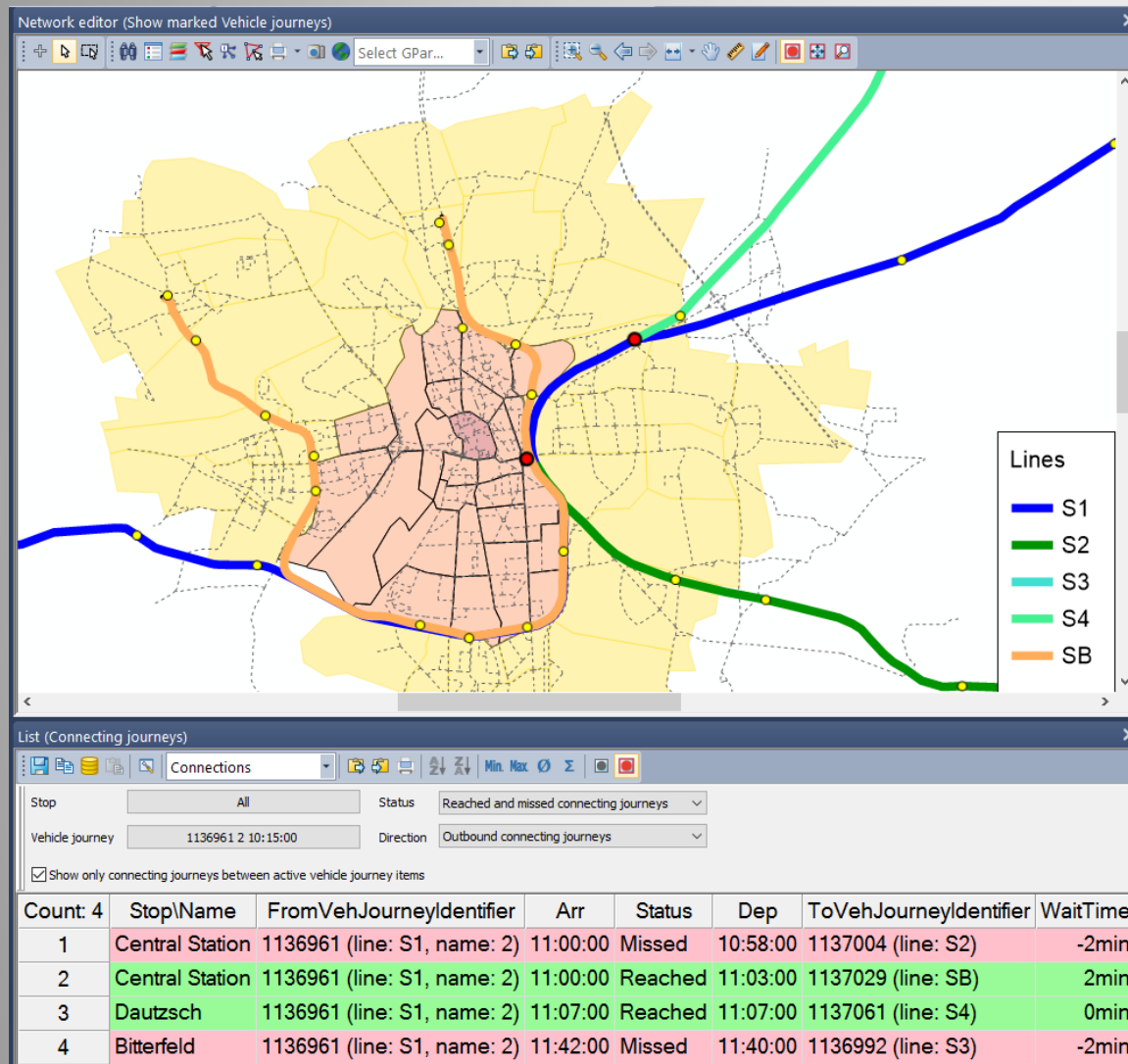


New option under
Demand model > activities



Distribution of work places
among persons of different
groups is a result of the
calculation !!

ANALYSING CONNECTIONS

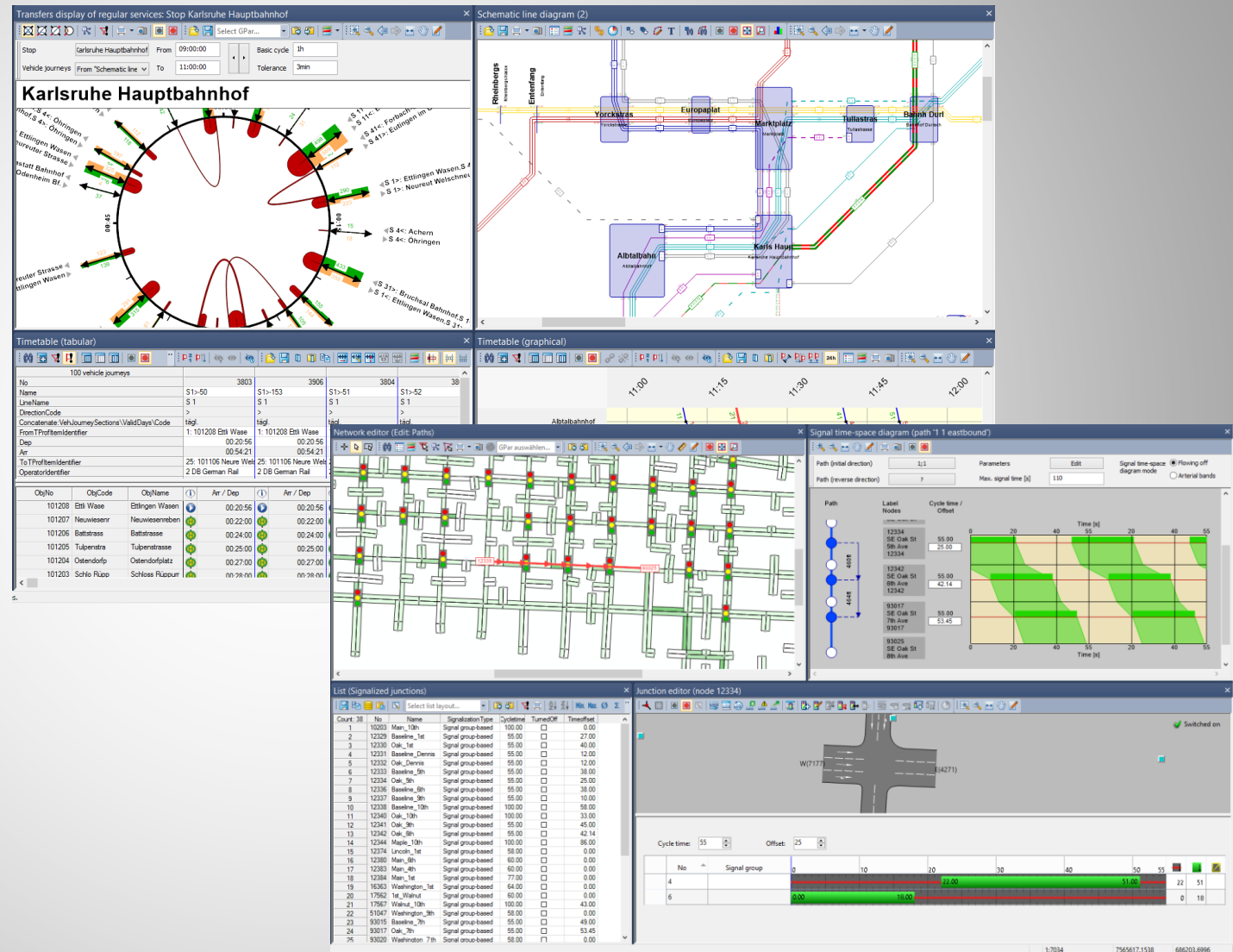


Overview of connections

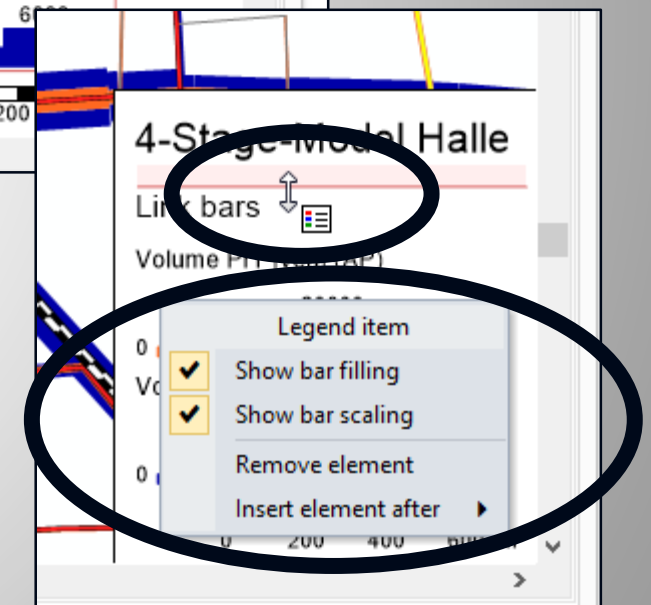
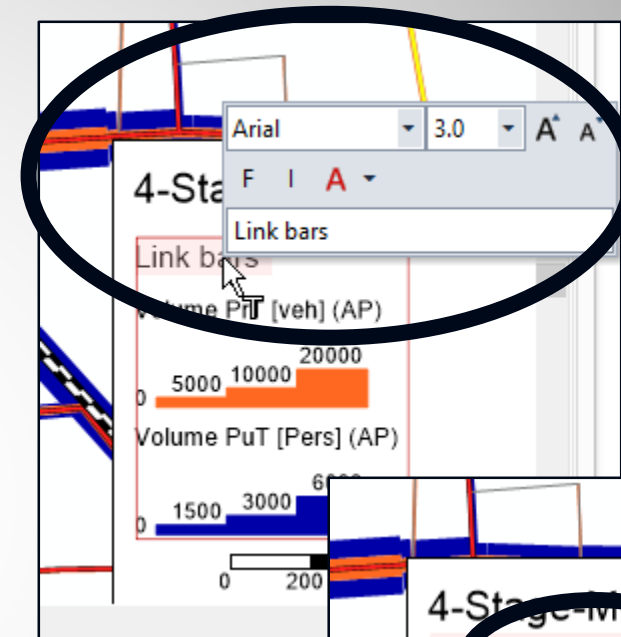
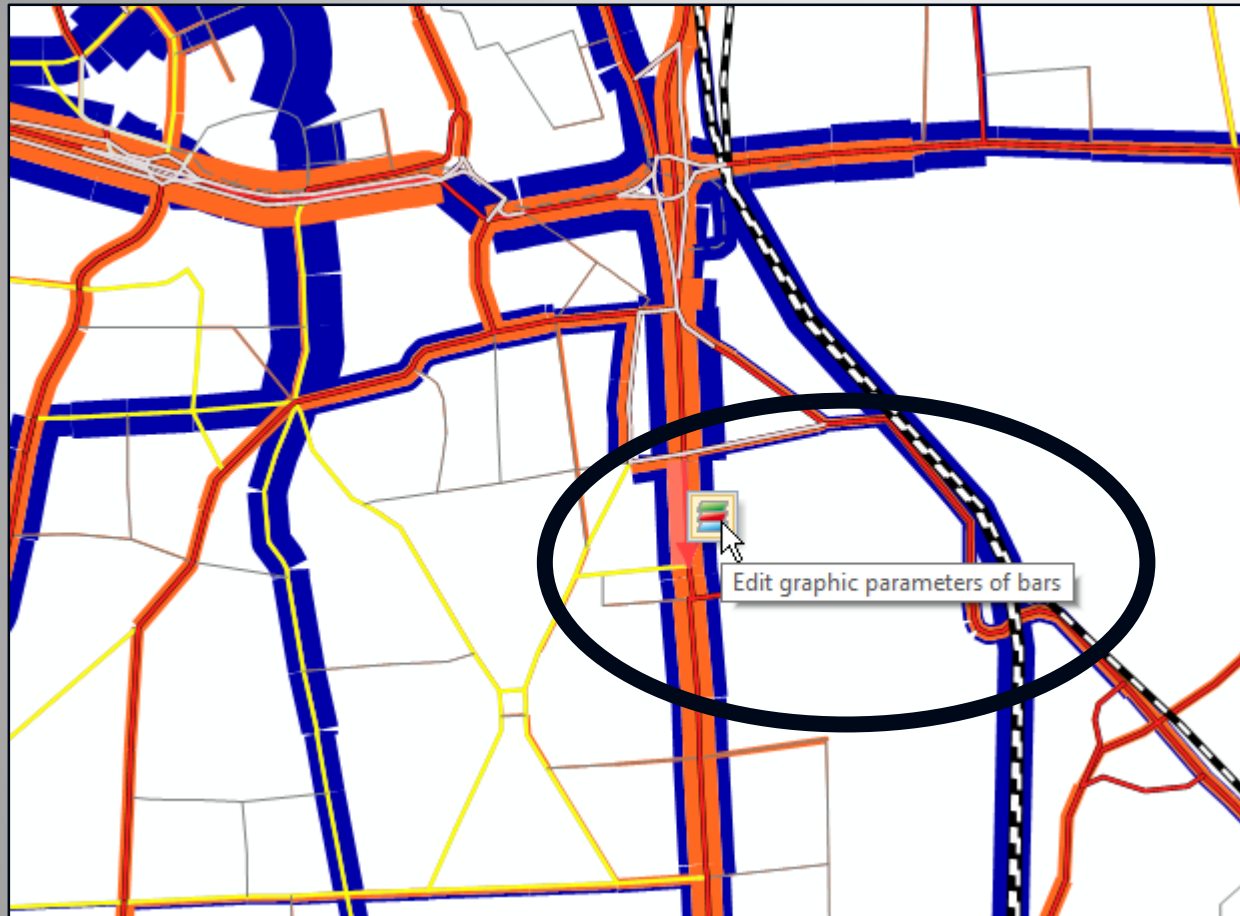
- new list: Connecting journeys
- connections listed for stop or vehicle journey
- status: „Missed“ / „Reached“
- adjustable time window for max. wait time between connecting journeys
- synchronization
- easy to use in version comparison to highlight changes of missed and reached connections for different scenarios

GLOBAL LAYOUT

- manage settings of all open windows in one single layout file including
 - window positions
 - filter settings
 - graphic parameters
 - view-specific layout settings
- drop-down menu in toolbar for easy access to files
- files for view-specific settings remain



DIRECT EDITING OF LINK BARS AND LEGEND



3D - INFO SIGNS

- info signs for labeling arbitrary network objects
- combination of free text and attribute values
- graphic design
 - size
 - alignment
 - rotation
 - show/hide via storyboard actions
 - ...

PTV Visum 64 Bit 17.00-01 (beta version, operable until 31.10.2017) - Network: 3D_Info Signs.ver* - [Räumliche Netzansicht (1)]

File Edit View Lists Filters Calculate Graphics Network Demand Scripts Windows Help 3-D network view

Select filter... Select global layout... 0600

Network

- Nodes
- Links
- Turns
- Zones
- Connectors
- Main nodes
- Main turns
- Main zones
- Territories
- OD pairs
- Main OD pairs
- PrT paths
- POIs
- GIS objects
- Screenlines
- Count locations
- Detectors
- Toll systems
- Sharing stations
- Stop points

Matrices

- All matrices
- Demand matrices
- Zone matrices

Quick view (Storyboard a...)

StoryboardNo

StoryboardNo	Name	Start Time	Dwell Time	Transition Time	Change Camera Position	Change GPar	Change Model Time	Change Presentation Speed
101	InfoSigns							

Räumliche Netzansicht (1)

Camera position... Select GPar... Original speed

PTV Visum 17
New 3D Info
Signs

Storyboard

Number: 101

Name: InfoSigns

Description:

Tabular editing

	13 Pos_0	1 Pos_1	8 Po	9 Po	1	12 Pos16	21 P
Camera position	BasisNet_dark.gpax	Pop	Loc_P				Link
Model time							06.0
Streaming speed							600
Marking (type)							
Marking (objects)							
Visible information signs	11	3 2	1 4				14 1

Network editor Liste (Bezirke) List (Information signs) Liste (Points of Interest) Liste (Storyboardaktionen) Räumliche Netzansicht (1) Liste (Storyboards)

A storyboard is currently being played. You cannot use the mouse or keyboard to interact.

726833.4772 5718520.5400

PRT ISOCHRONES BY DESTINATION

The screenshot displays the 'Graphics tools (Isochrones)' window in PTV software. The 'Search direction' section has two radio buttons: 'Reference objects are origins' (unselected) and 'Reference objects are destinations' (selected and highlighted with a red box). The 'Route choice criterion' is set to 'tCur'. The 'Unlimited search' option is unselected, and 'Cancel search when' is selected with a maximum time of 3600. The 'Nodes' list is visible at the bottom.

Two maps illustrate the difference in isochrone calculation:

- Top Map:** Labeled 'Node 984 = origin'. It shows isochrones radiating from node 984, which is the starting point of the search.
- Bottom Map:** Labeled 'Node 984 = destination'. It shows isochrones radiating from node 984, which is the target point of the search.

A large red diagonal banner across the maps reads: **By popular request of our users !!!**

ADD-IN: OD IMPORT

OD Import

Source file: ...

Demand matrices **Skim matrices**

Time reference

Time stamp:

Date:

Interval (in min):

Location reference

Object type:

☐ Assign stop area by coordinates

Origin stop area:

Destination stop area:

Segmentation:

Weight:

O_Zone	D_Zone	INDEX	STARTStop	ENDStop	Departure	Arrival	AdultStudent	NumPers	Transfers	Distance	Ticket
10	20	1	115	45	04:22:14	04:35:28	Student	0,55	0	1,49	MonthlyPass
10	20	2	115	45	04:37:14	04:50:28	Adult	0,55	0	1,49	MonthlyPass
10	20	3	18	45	04:50:31	05:02:45	Adult	0,56	0	1,57	DayPass
10	20	4	18	45	04:52:31	05:04:45	Student	0,56	0	1,57	SingleTicket

- converting OD data to matrices
- segmentation
 - time slice
 - content
- flexible attribute allocation
- result: multiple matrices (per time interval x segment)
 - (main-) zone
 - stop areas
- special features
 - mapping coordinates → zones
 - calculation of skim matrices (weighted average, sum)
 - calculation of travel time using departure and arrival times

GENERIC ACCIDENT MODEL

for which network objects?

several models:

differentiation by attribute value

model variables: arbitrary attributes of
selected network object types

optional time-dependent model:

calendar year as additional model variable

optionally data for several years can be
read from other files

New Add-In 'Generic Accident Model'

Create APM file

APM file: C:\Demodaten\Halle\node-example.cfg ...

Netobject: Node

Variant: Control type Add Remove

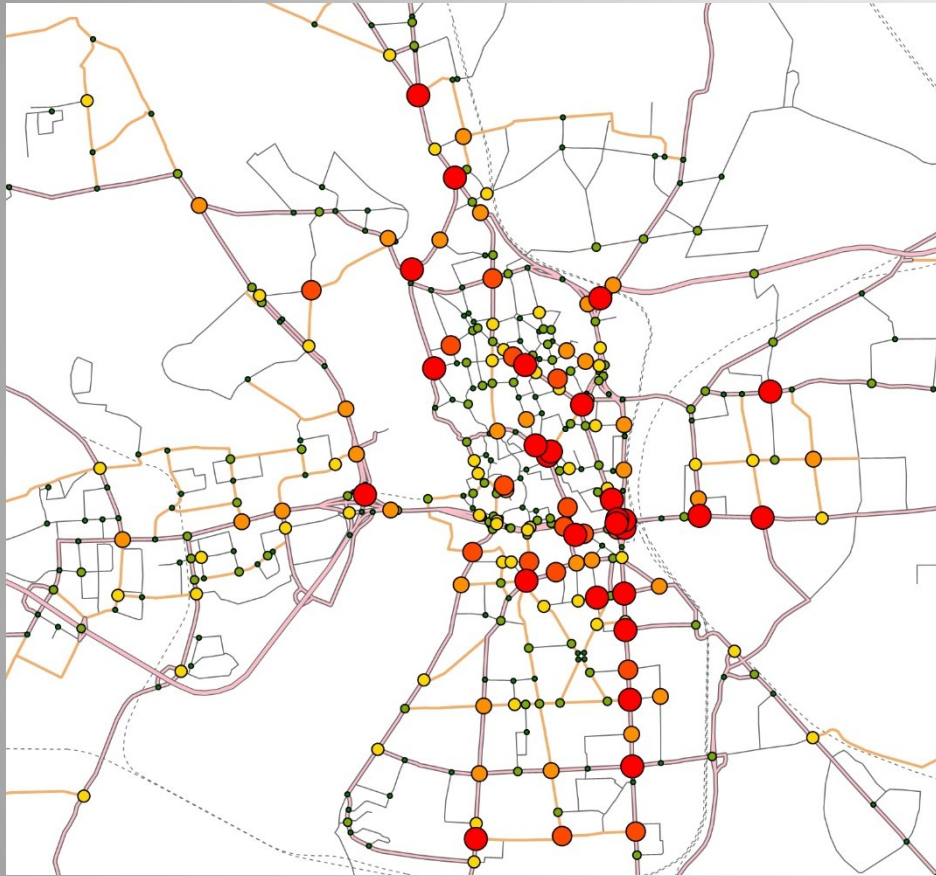
Parameter: Volume PrT
Number of legs Add Remove

☒ time dependent model

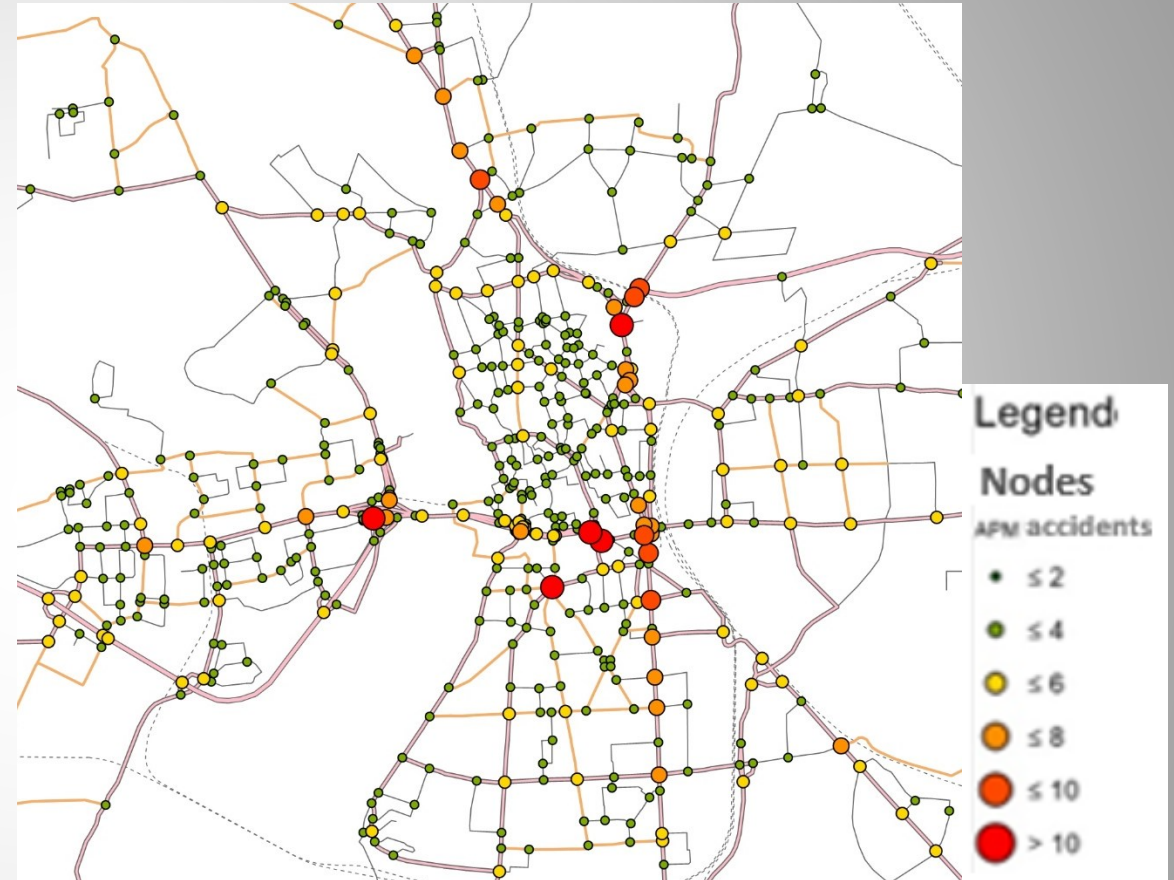
Year	Version
2009	C:\Demodaten\Halle\halle_2009-2011.ver
2010	C:\Demodaten\Halle\halle_2009-2011.ver
2011	C:\Demodaten\Halle\halle_2009-2011.ver

Help OK Cancel

EXAMPLE: GENERATED ACCIDENT MODEL



Actual accidents at nodes in a calendar year



Generated Accident Model:

unknown: $\exp (64 + .0000049 V + 0.35 n - 0.03 t)$

signalized: $\exp (228 + .0000193 V + 0.25 n - 0.11 t)$

roundabout: $\exp (159 + .0000035 V + 0.54 n - 0.08 t)$

V: traffic volume, n: number of legs, t: time

TECHNICAL CHANGES

Changes

- no support of Windows Vista OS
- removal of the 32Bit-Version

COM / Scripting

- update of Python libraries
- removal of obsolete COM methods
(WriteToLogFile,... → Visum.Log,
AddODMatrix, AddSkimMatrix,...)



The image shows a yellow and red tram with various advertisements. A large, semi-transparent logo for 'PTV GROUP' is centered over the tram. The logo consists of the word 'PTV' in white on a grey rectangular background, followed by the word 'GROUP' in white on a red rectangular background. The tram itself has a red banner with the text '... false then ... karriere.ptvgroup.com' and several smaller 'PTV GROUP' logos. A woman's face is visible in an advertisement on the right side of the tram.

PTV GROUP

www.ptvgroup.com