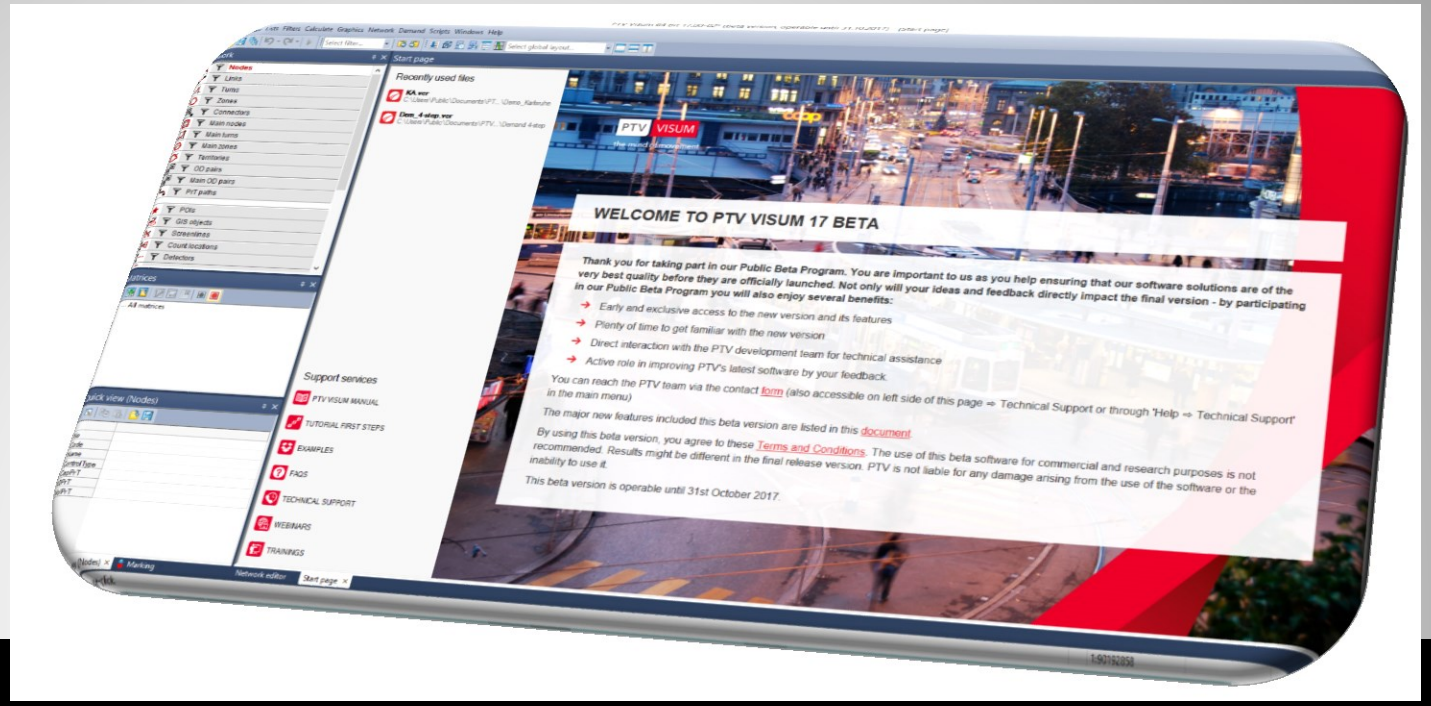
PTV GROUP

the mind of movement



NEW IN PTV VISUM 17

www.ptvgroup.com

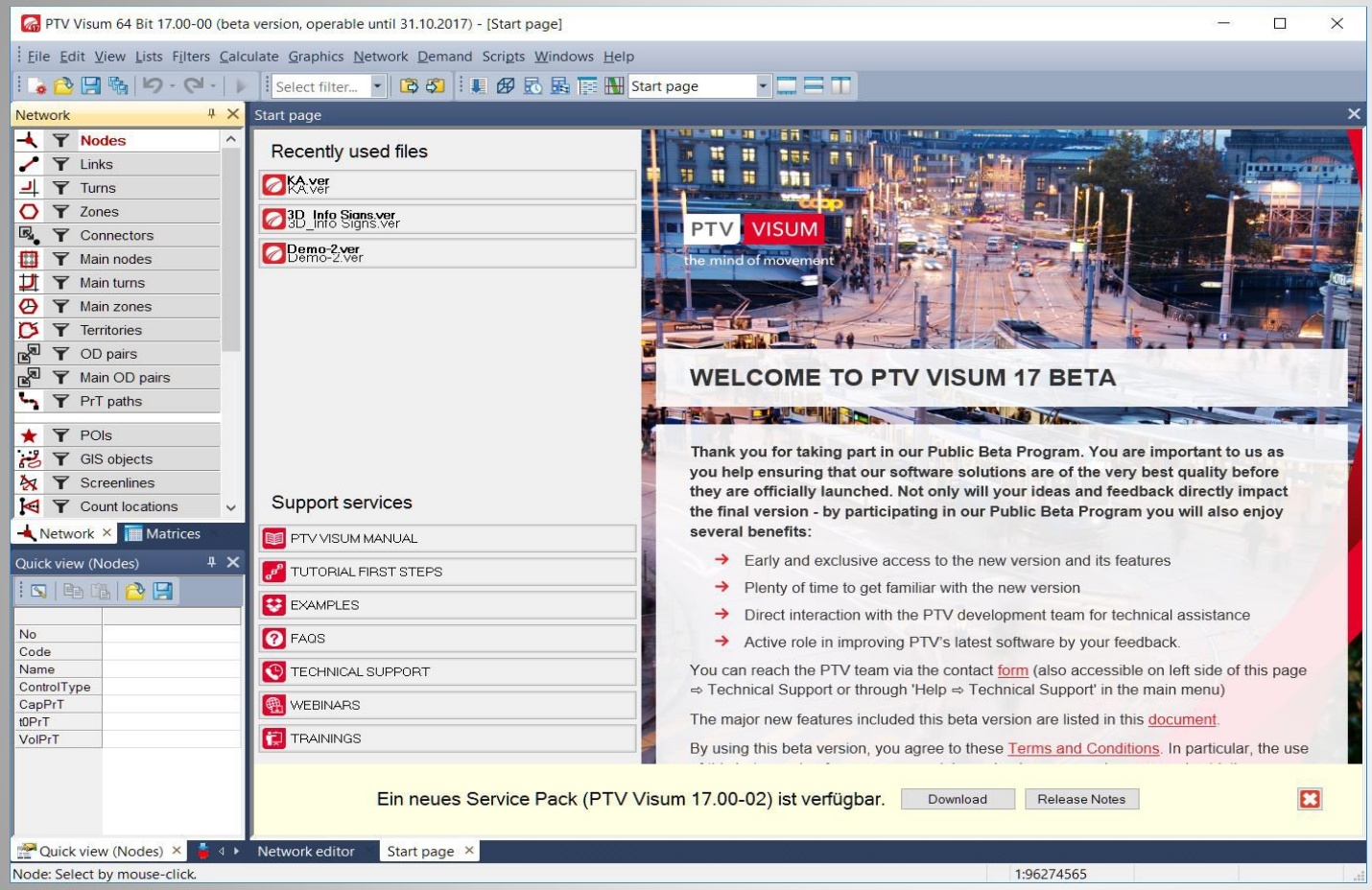
PTV VISUM – DEVELOPMENT 2012 - 2016

	2012	2013	2014	2015	2016
Graphical user interface/ GIS	➨ Window redesign ➨ Transfers display Schematic line diagram	➨ Formula editor	➨ Distributed computing ➨ Multi-user mode ➨ Redesign of the timetable editor	➨ Improved display of isochrones ➨ New functions in the formula editor	➨ Visum 3D ➨ Synchronization
Private transport	➨ Multi-threading of LUCE	➨ Improved Assignment with ICA		➨ Stochastic assignment for bicycles with path level costs	➨ Simulation-based dynamic assignment (SBA)
Public transport	➨ Capacity restriction in the timetable-based assignment ➨ Fares for the headway-based assignment	➨ Reporting ➨ Add-In Import transit supply	➨ Skim matrix calculation for stop areas ➨ Arrival time-based demand	➨ Couplings ➨ Passenger trip chains	➨ PuT assignment with “Optimal strategies” ➨ Check-in/ Check out data support
Demand modeling	➨ Add-In Nested Demand Model	➨ Formula matrices	➨ Tour-based “Rubberbanding” ➨ Matrix references	➨ Tour-based freight model ➨ Park & Ride	➨ Built-in Nested demand model
Miscellaneous	➨ OSM Import ➨ Live Background maps	➨ One step Vissim export ➨ Visum Safety	➨ Import PuT supply from Visum	➨ GPX Import ➨ GTF Export	➨ Accessibility

Speed

User friendliness

PTV VISION START PAGE



Local content

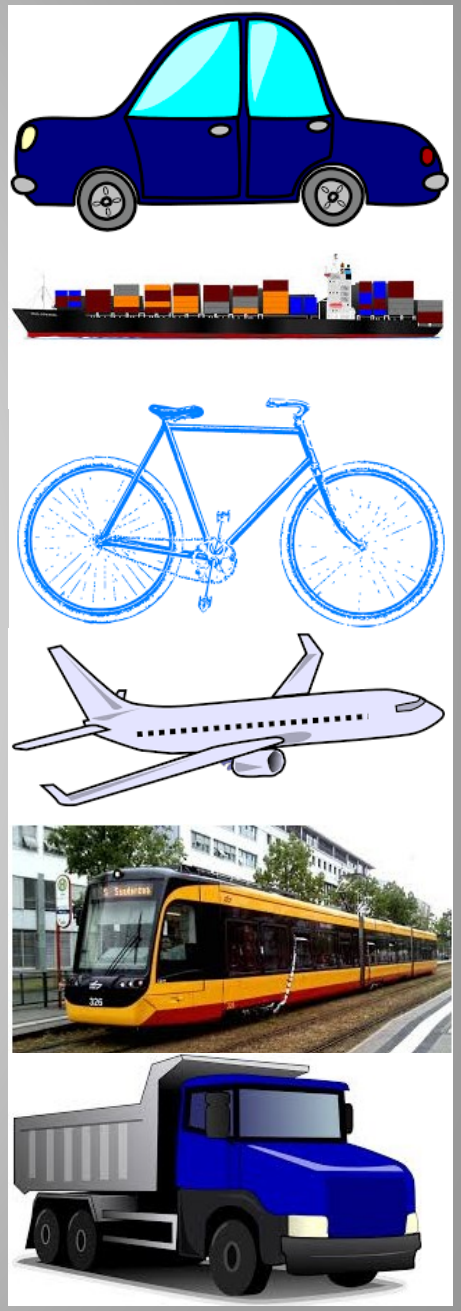
Dynamic HTML page

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



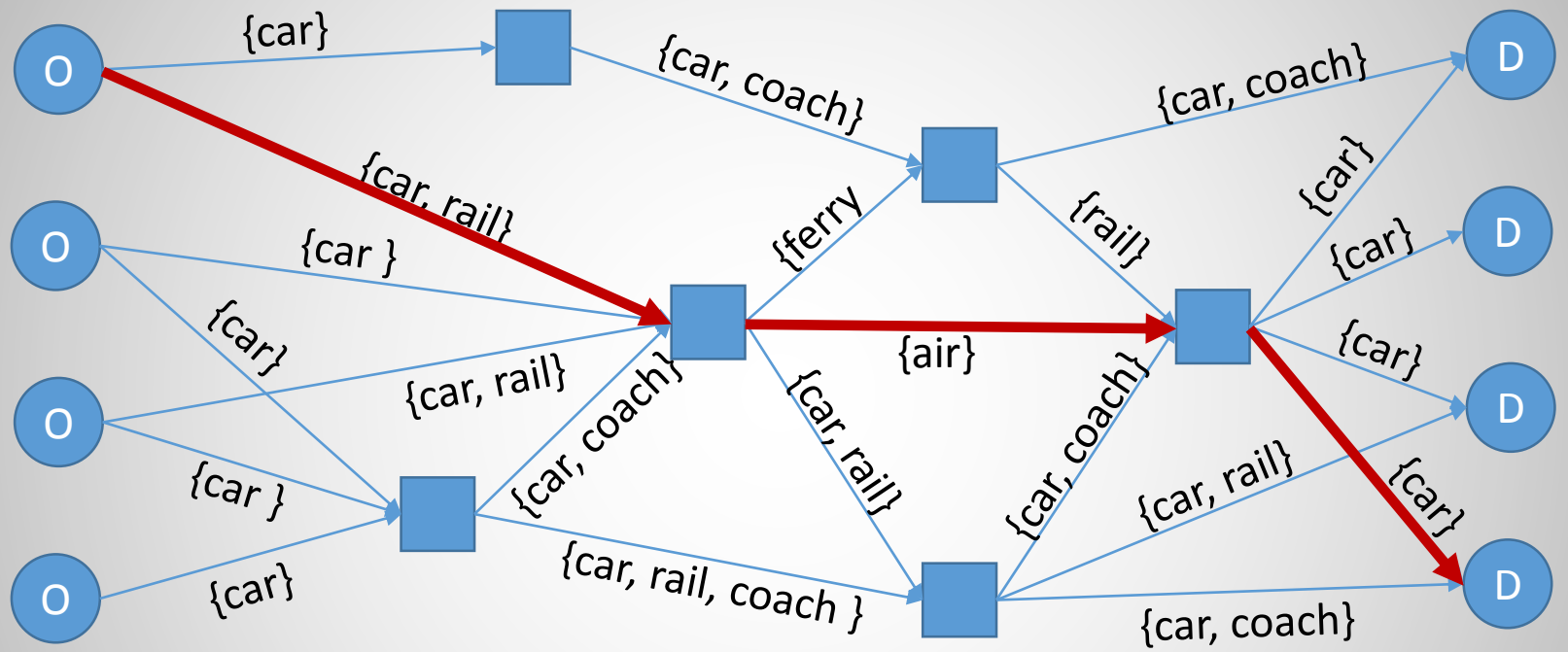
Motivation

- 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



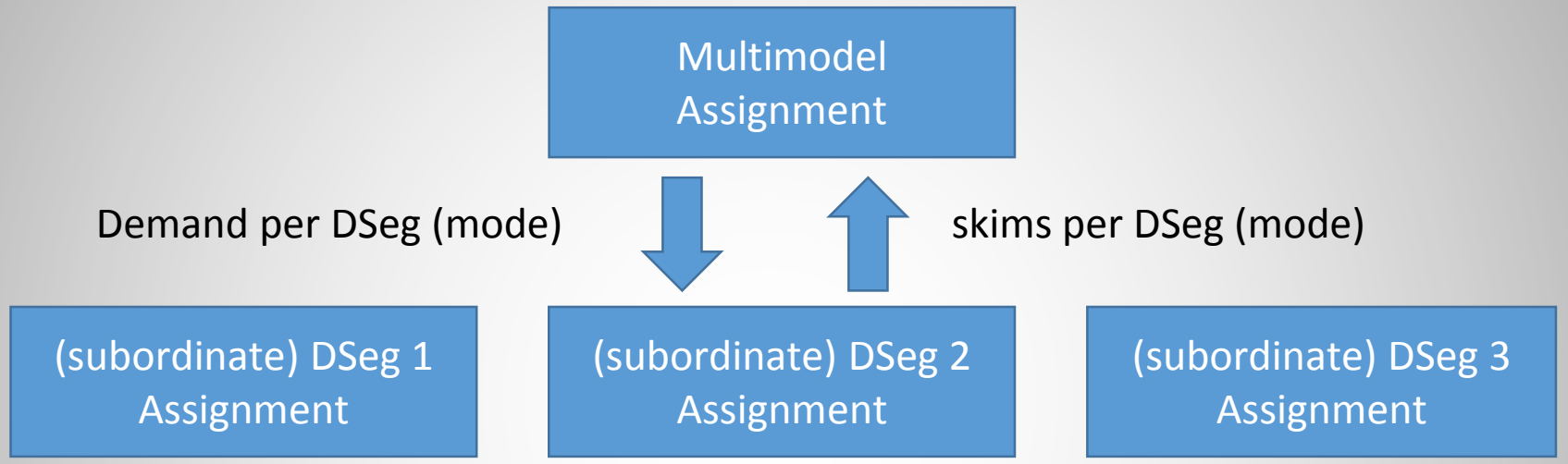
O Origin/Destination zone

zones with mode change

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

: possible path sequence for main mode {air}

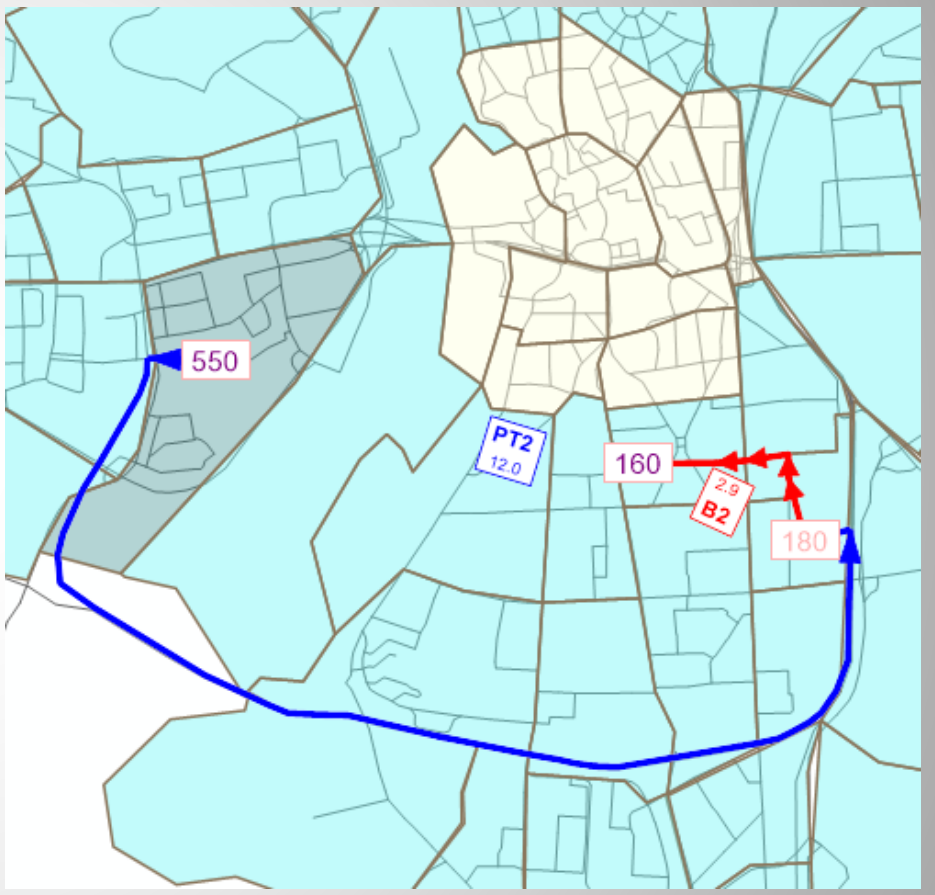
MULTIMODAL ASSIGNMENT – BASIC CONCEPT



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

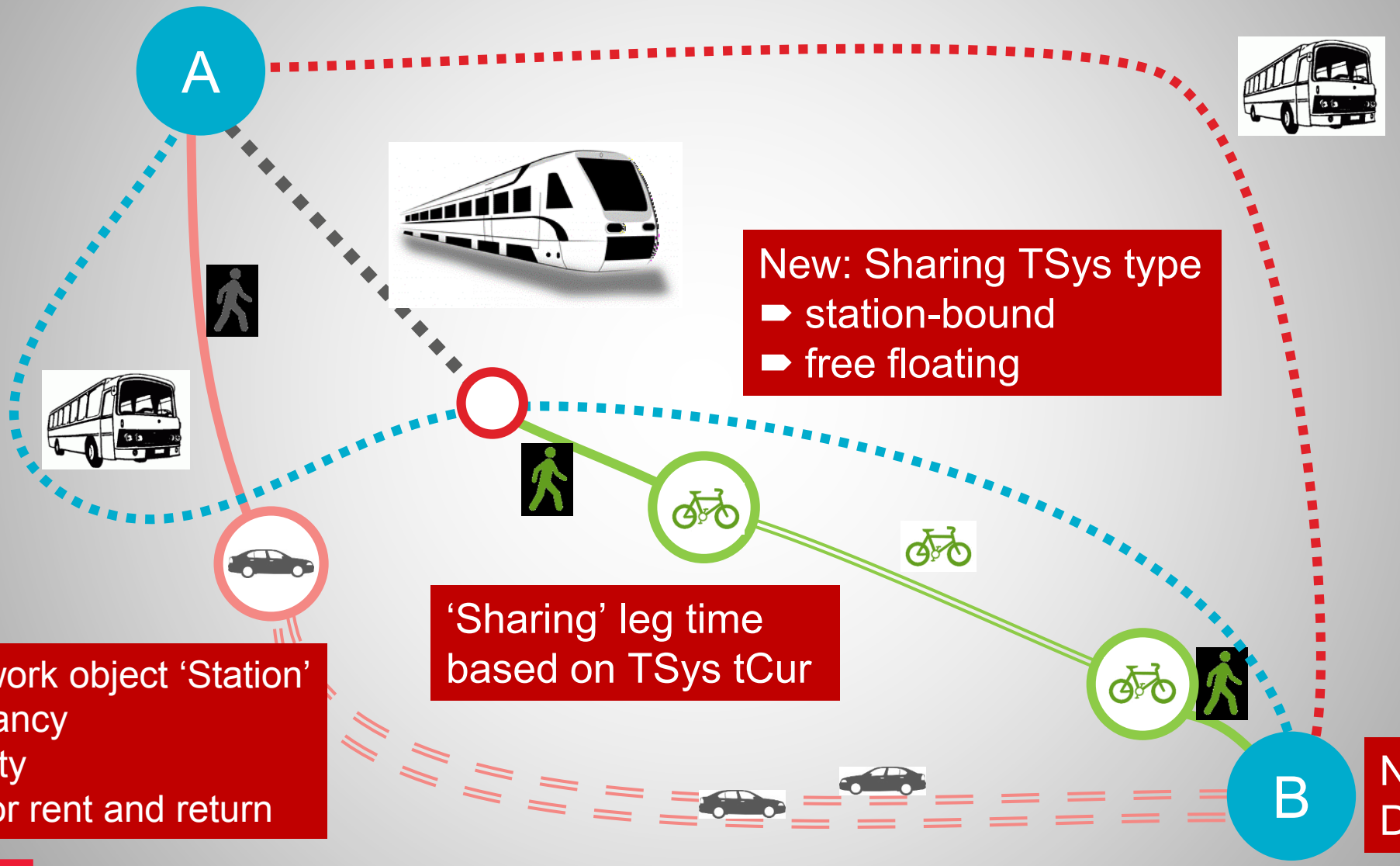


VEHICLE SHARING

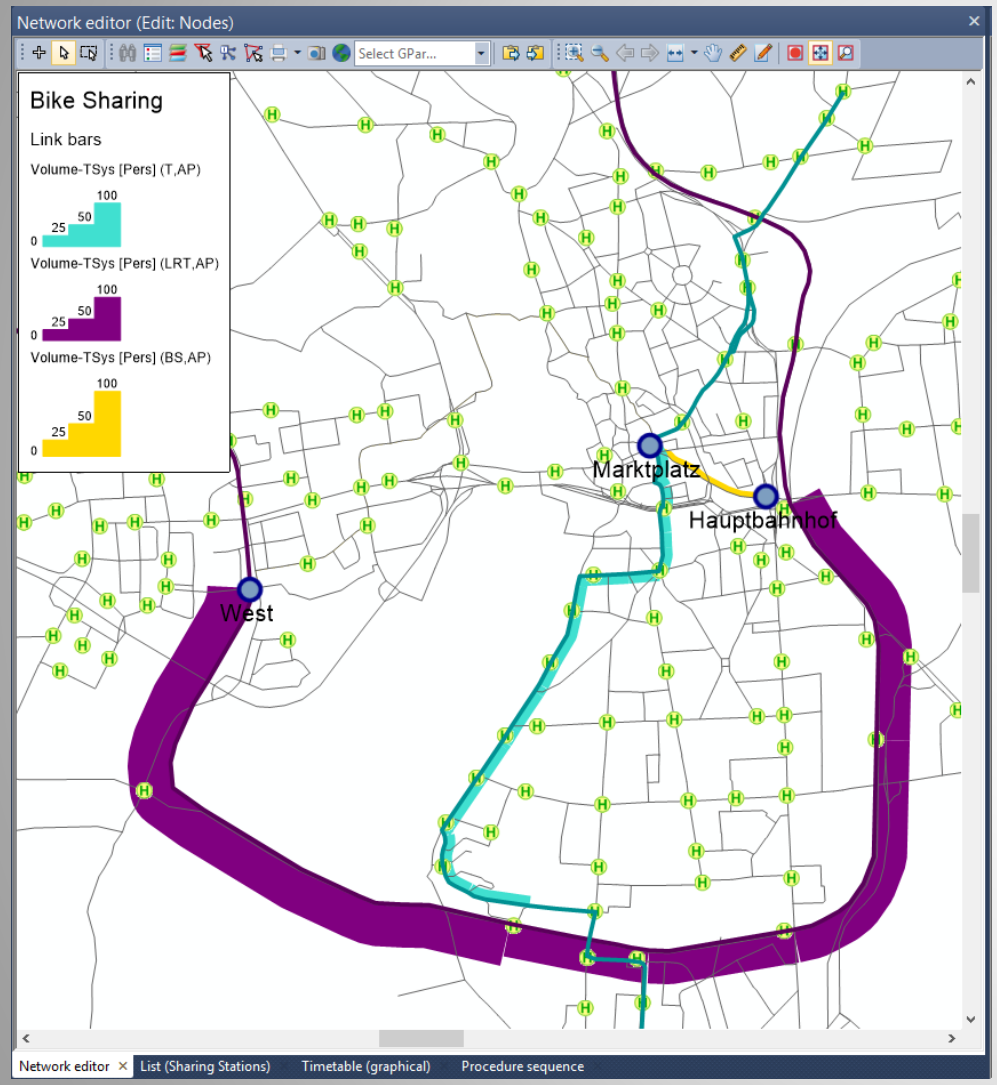
Modeling and evaluation of Vehicle Sharing Systems

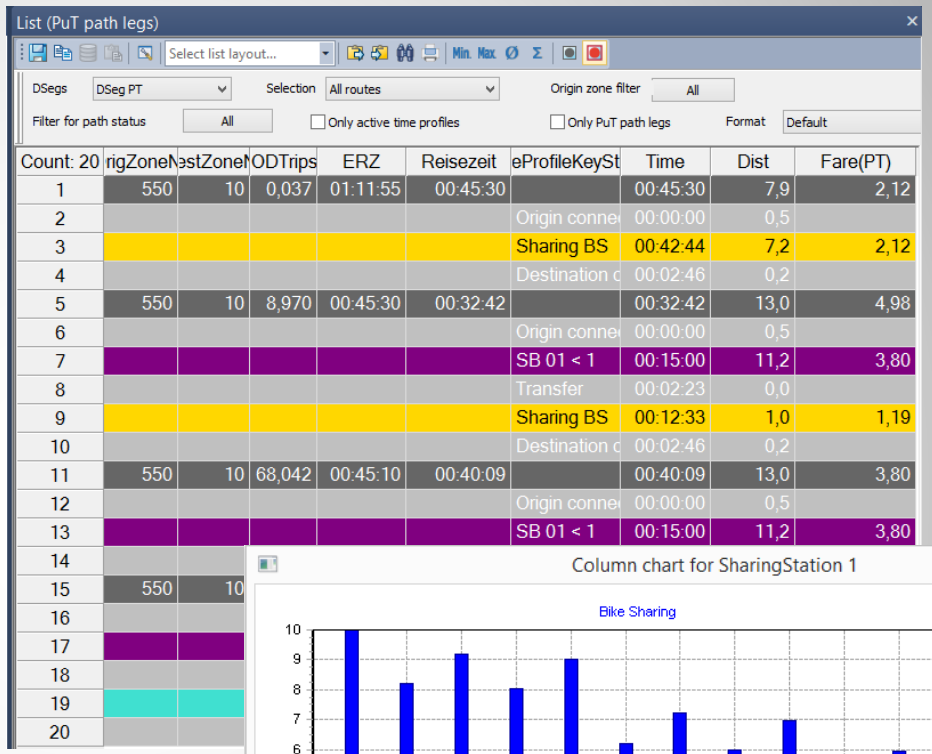
- increasing popularity of sharing systems
- modeling of sharing systems addressing city planners and operators
  - modeling the choice between PT and/or different sharing systems
  - support or competition for PT?
  - size/positioning of such systems

MODELING OF VEHICLE SHARING

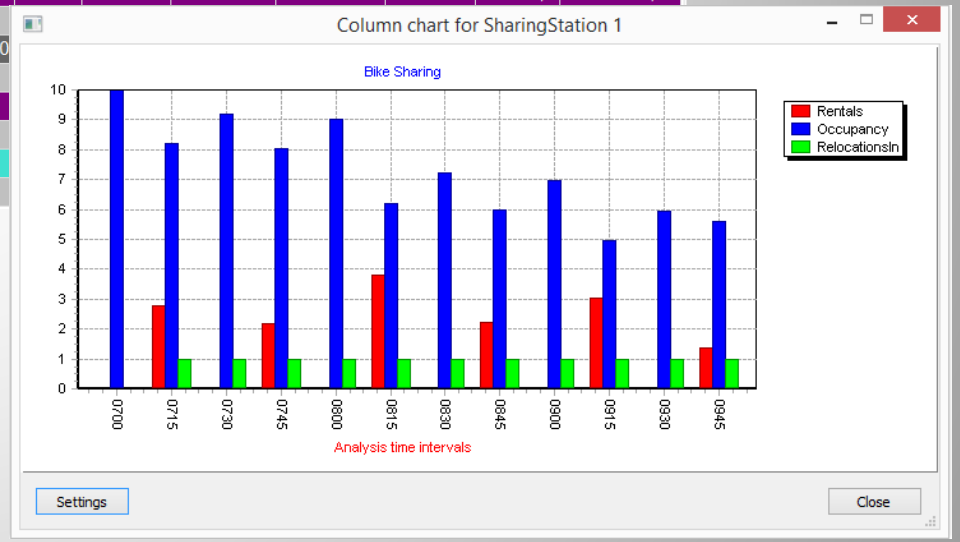


RESULTS – EVERYTHING YOU KNOW FROM PUBLIC TRANSPORT



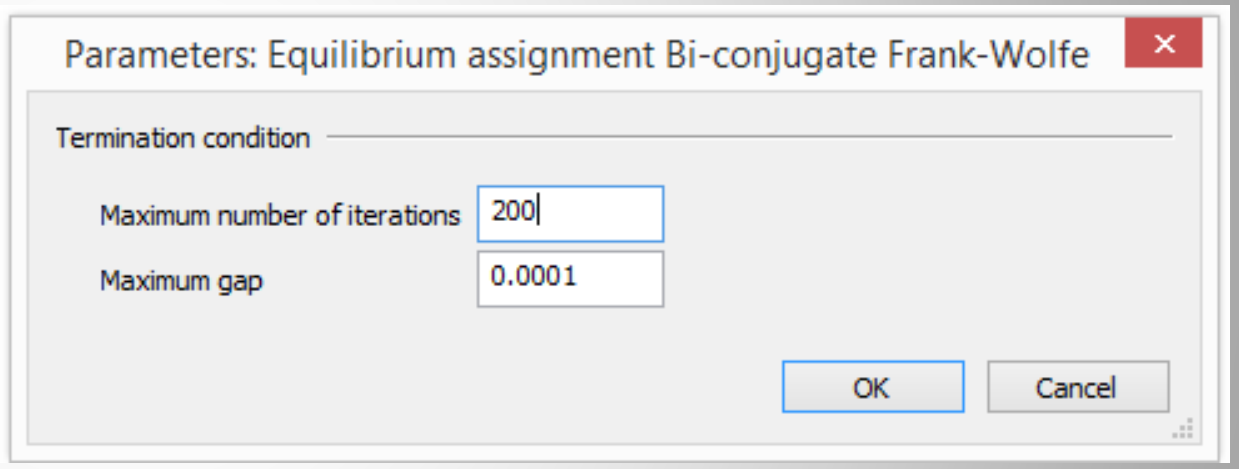


Count: 20	rigZone	stZone	ODTrips	ERZ	Reisezeit	eProfileKeySt	Time	Dist	Fare(PT)
1	550	10	0,037	01:11:55	00:45:30		00:45:30	7,9	2,12
2						Origin conne	00:00:00	0,5	
3						Sharing BS	00:42:44	7,2	2,12
4						Destination c	00:02:46	0,2	
5	550	10	8,970	00:45:30	00:32:42		00:32:42	13,0	4,98
6						Origin conne	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 conne	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									



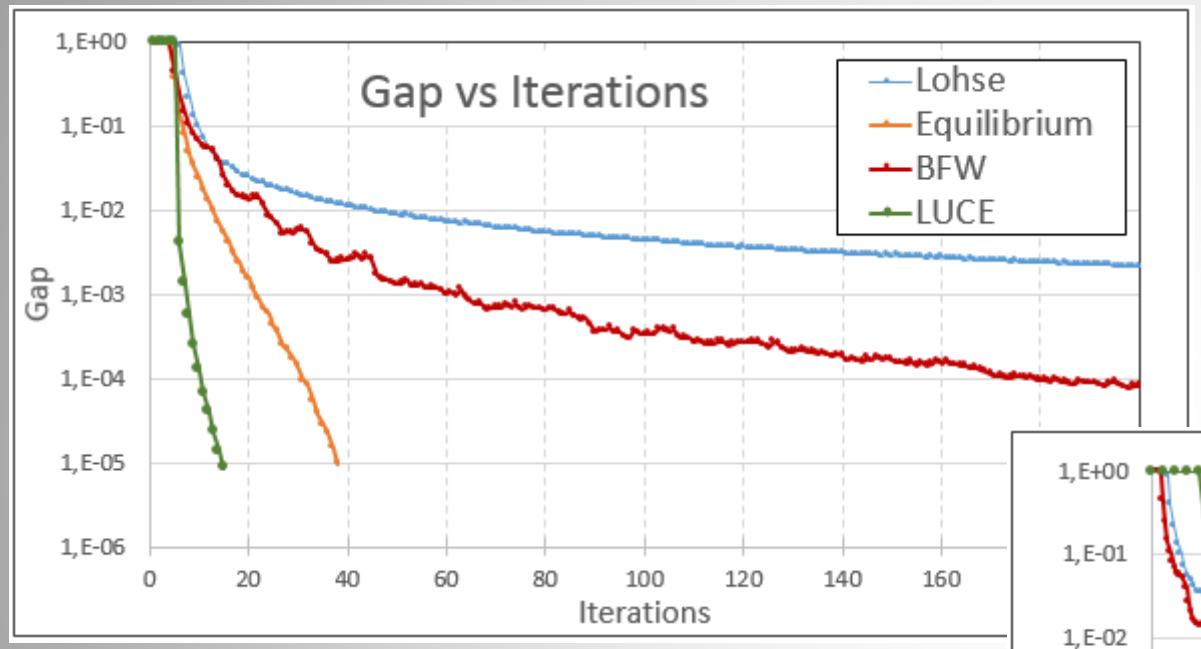
NEW PRT-ASSIGNMENT BI-CONJUGATE FRANK WOLFE (BFW)

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



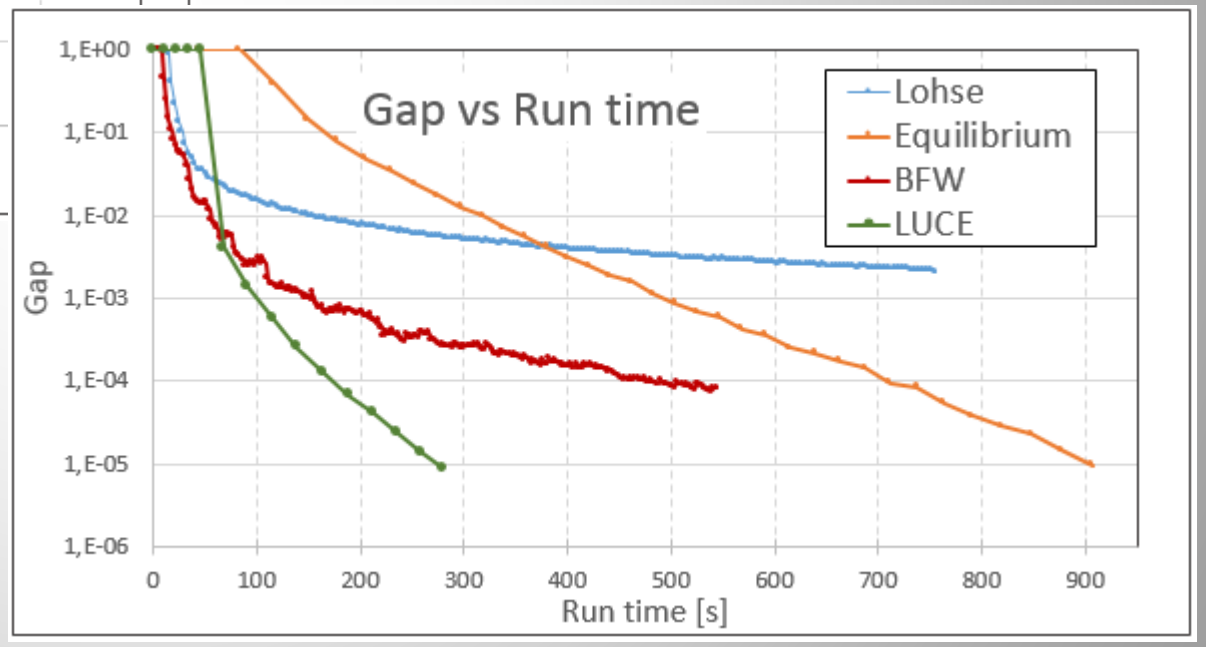
- as subordinate assignment in Assignment with ICA available

BFW IN COMPARISON TO OTHER ASSIGNMENTS



Hardware

- 4 cores
- @3.60GHz



Example network **Chicago**

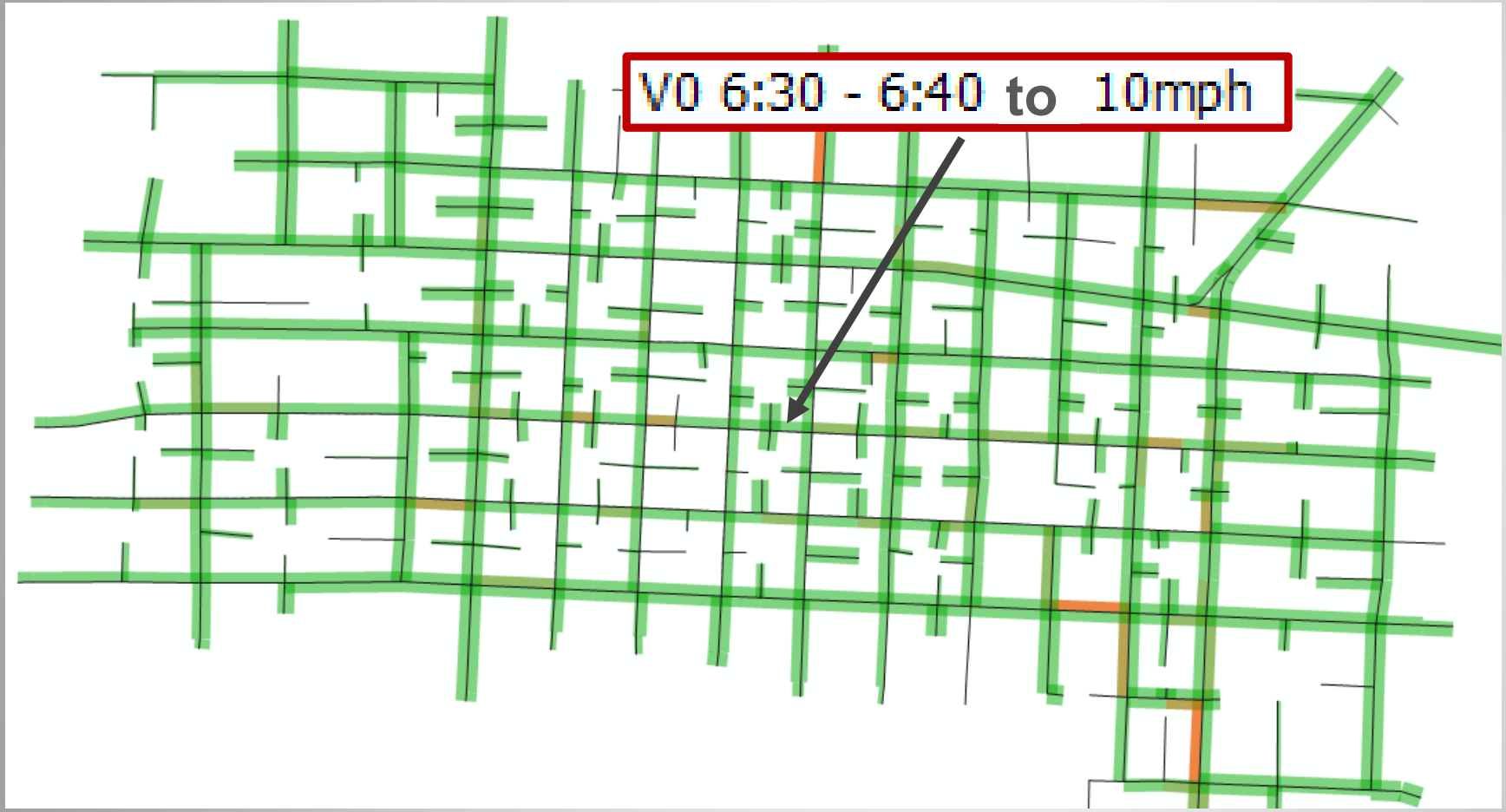
- 1,800 zones
- 41,000 links
- 13,000 nodes

EXTENSIONS IN SBA (1)

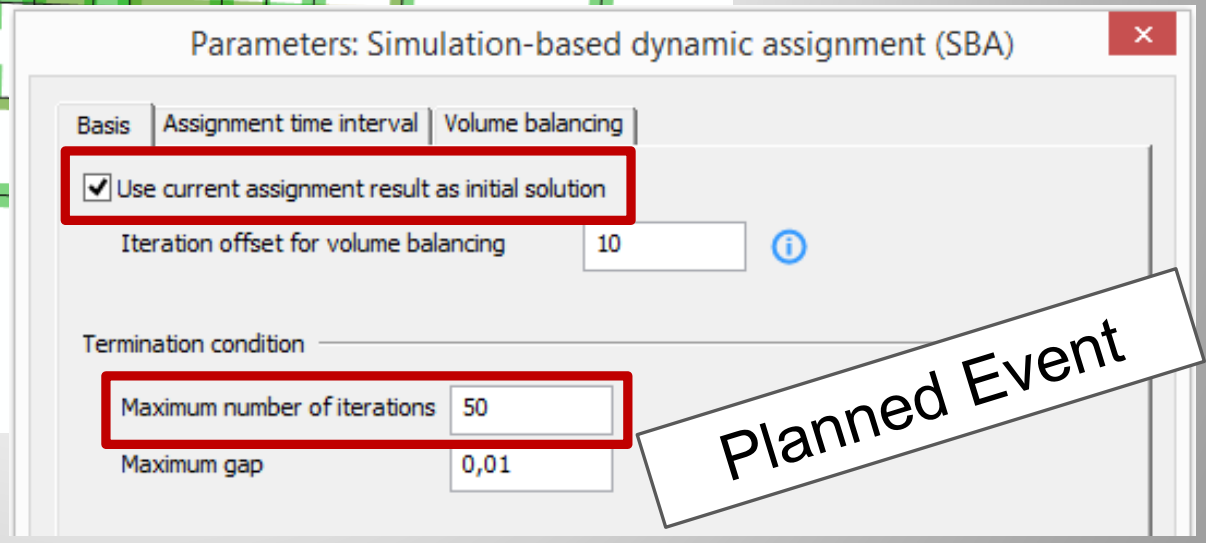
Modeling of planned and unplanned events

- “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

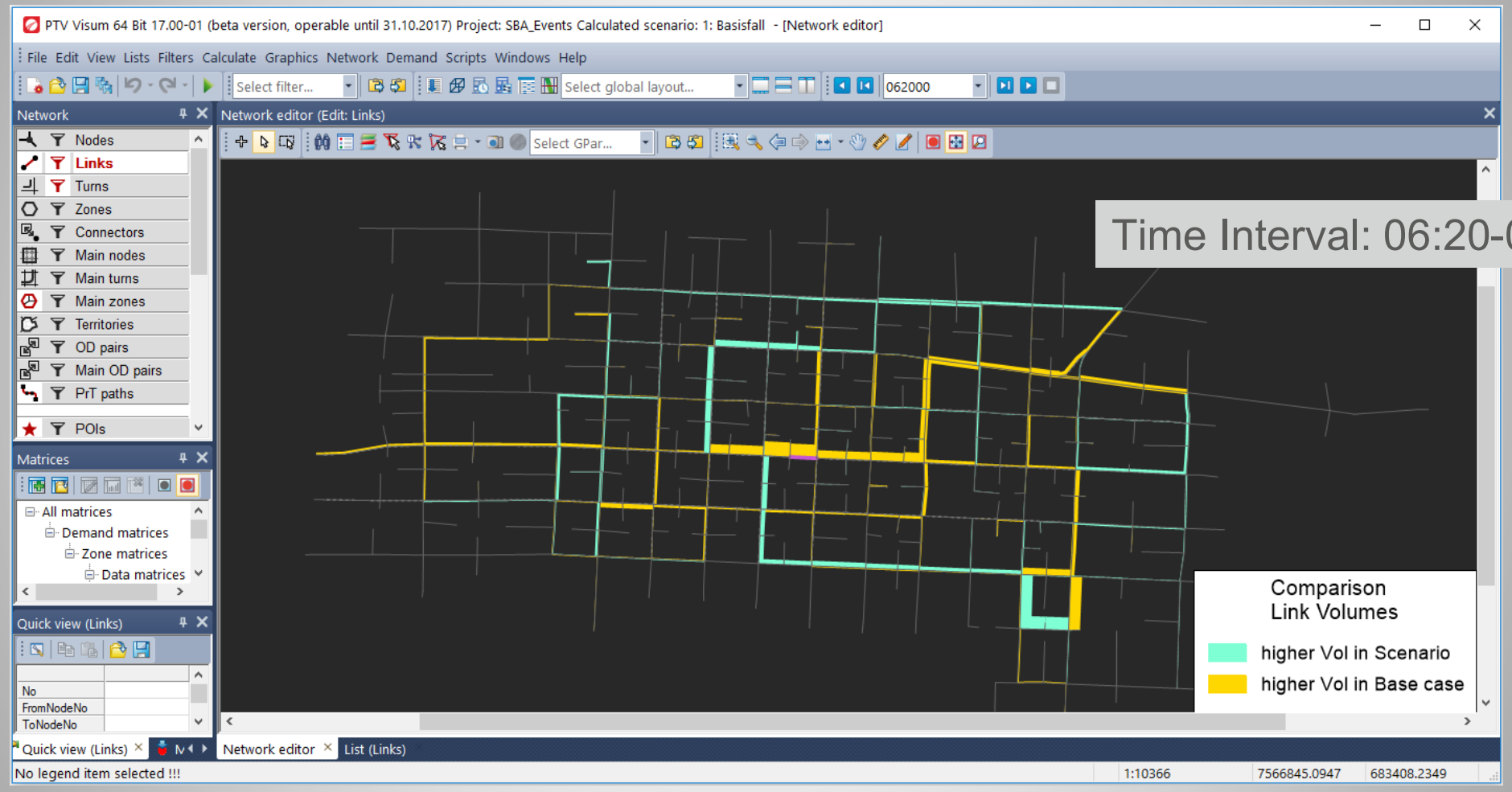


EXAMPLE: TEMPORARY SPEED REDUCTION

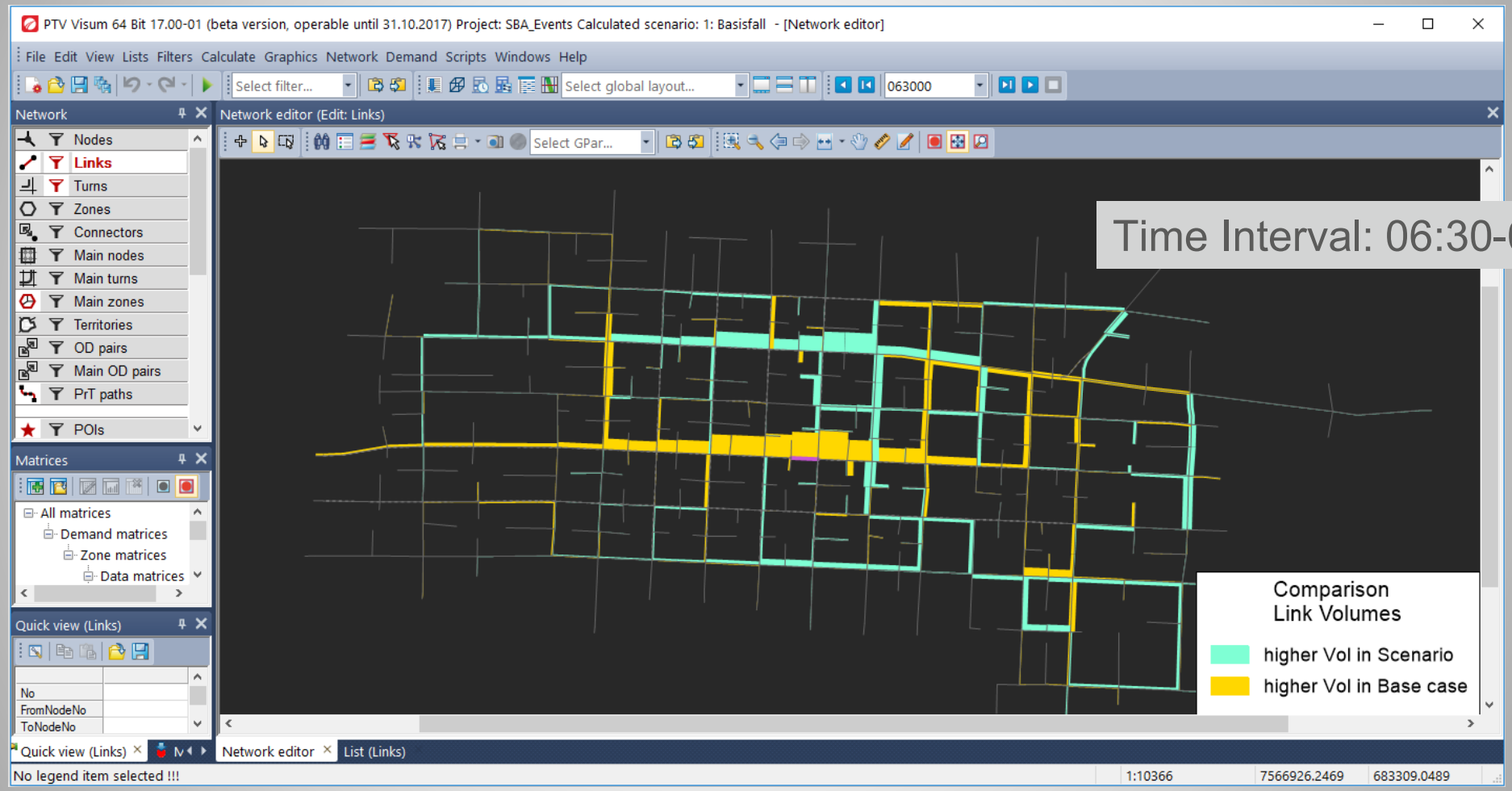


Planned Event

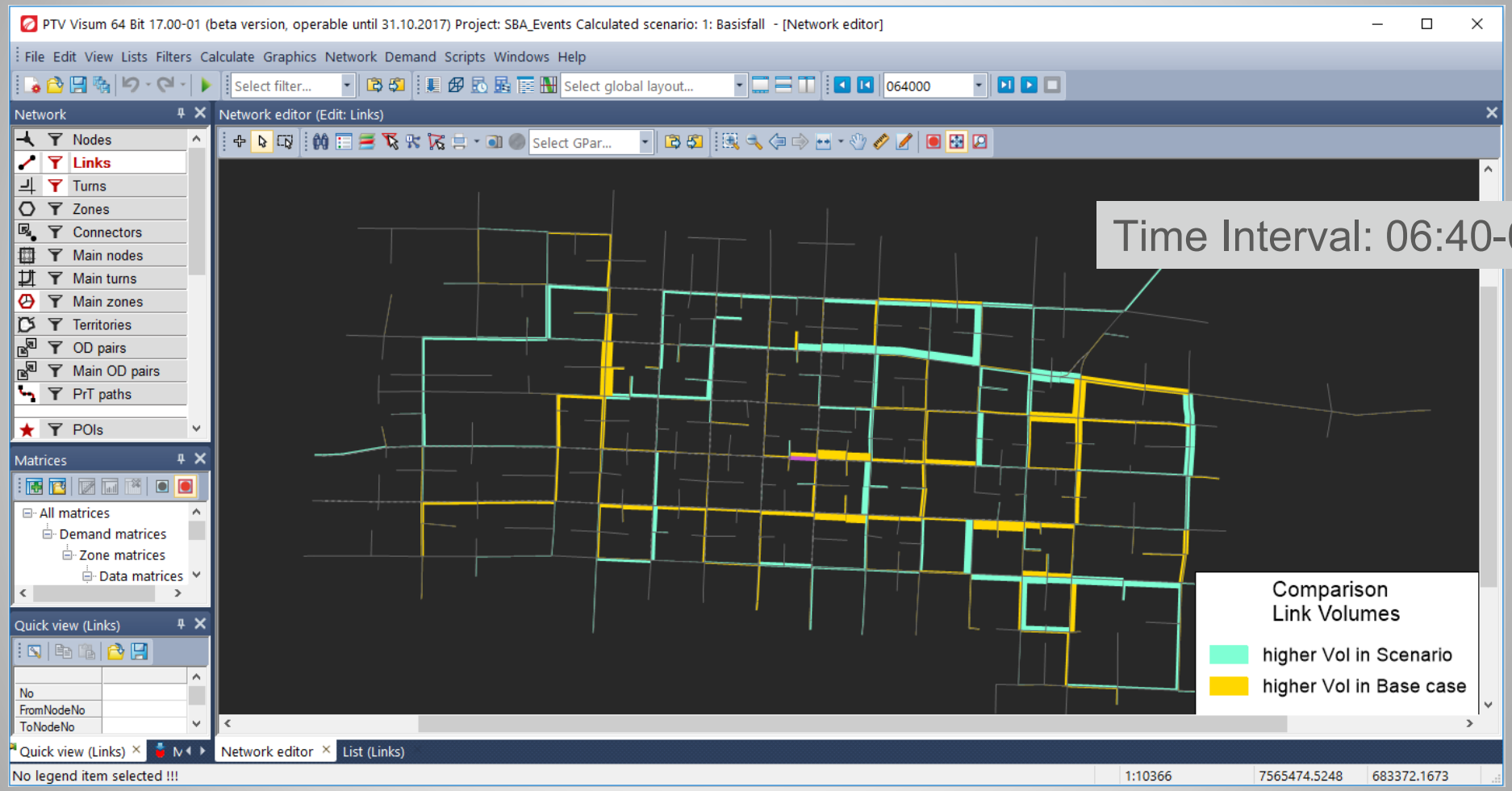
BASE CASE VS PLANNED EVENT: VOLUMES



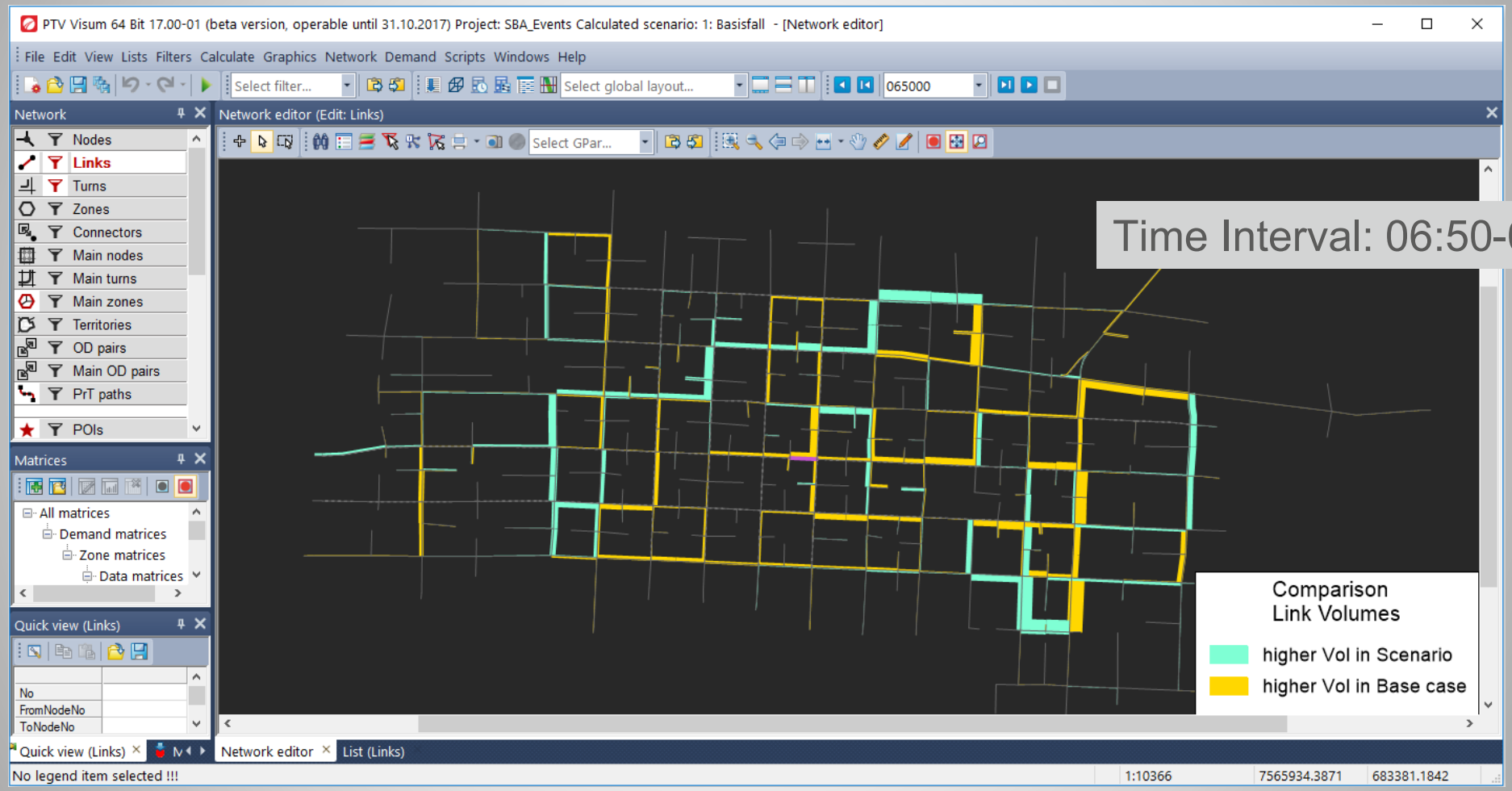
BASE CASE VS PLANNED EVENT: VOLUMES



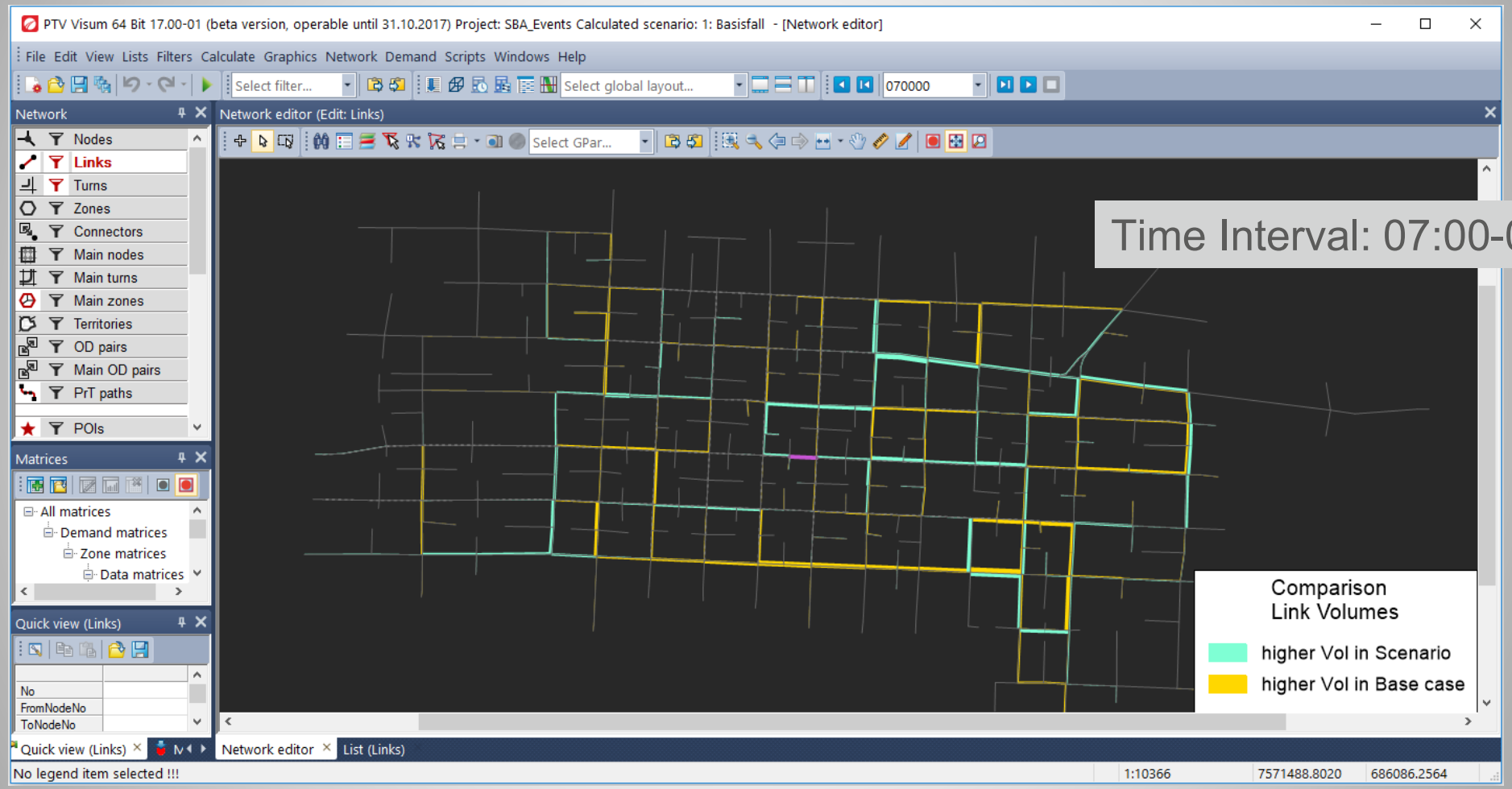
BASE CASE VS PLANNED EVENT: VOLUMES



BASE CASE VS PLANNED EVENT: VOLUMES



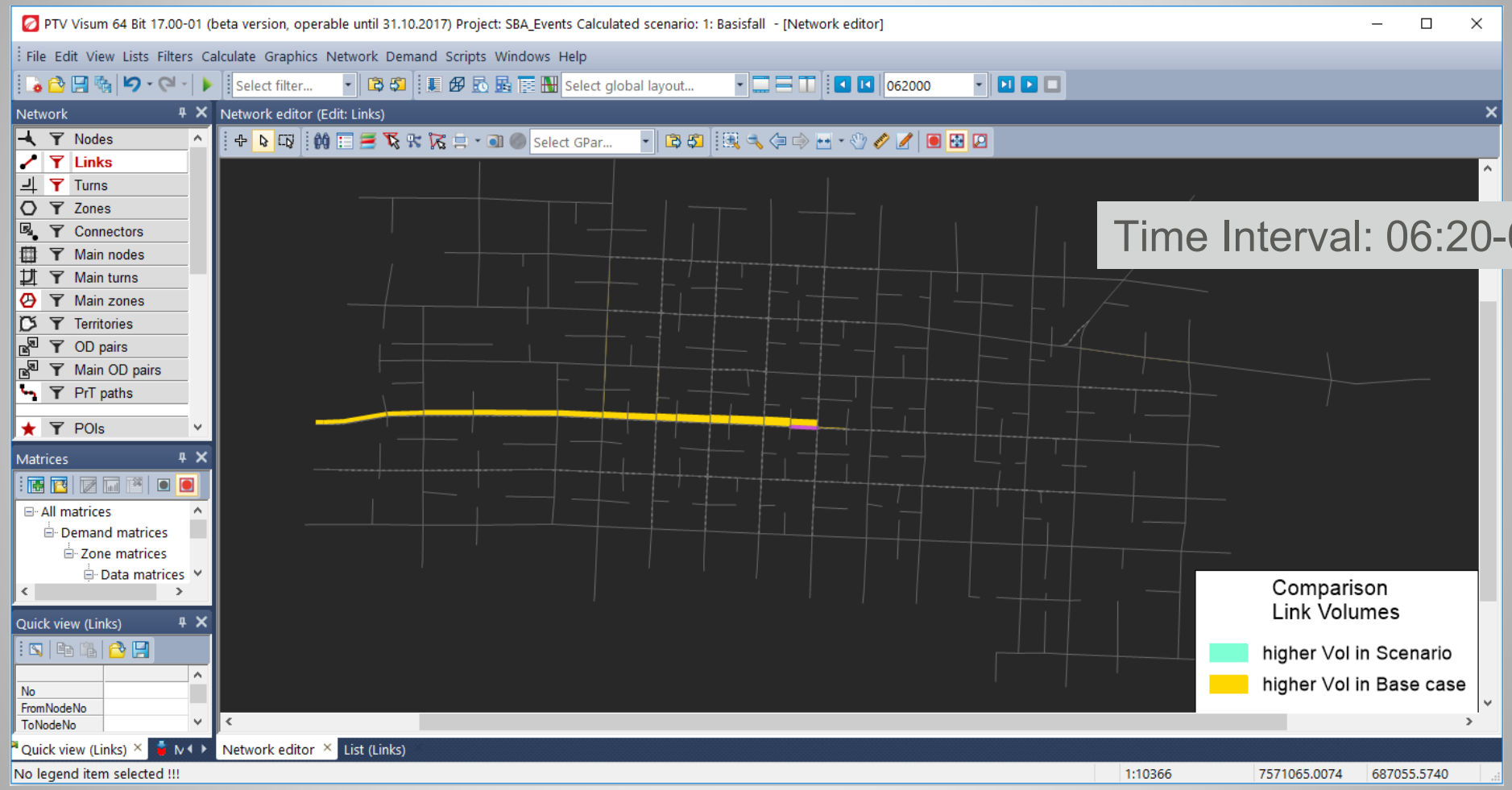
BASE CASE VS PLANNED EVENT: VOLUMES



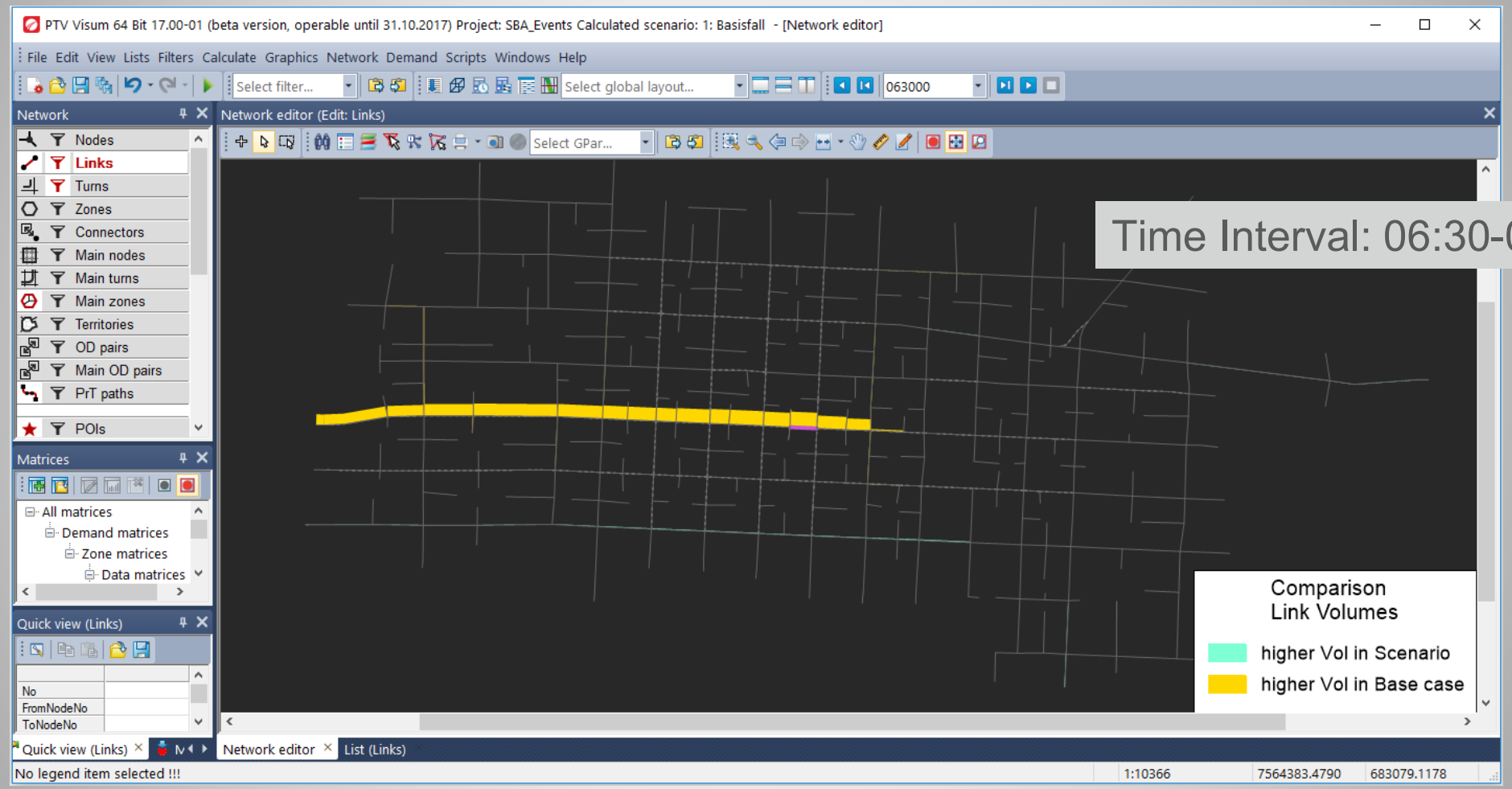
EXAMPLE: TEMPORARY SPEED REDUCTION

Unplanned Event

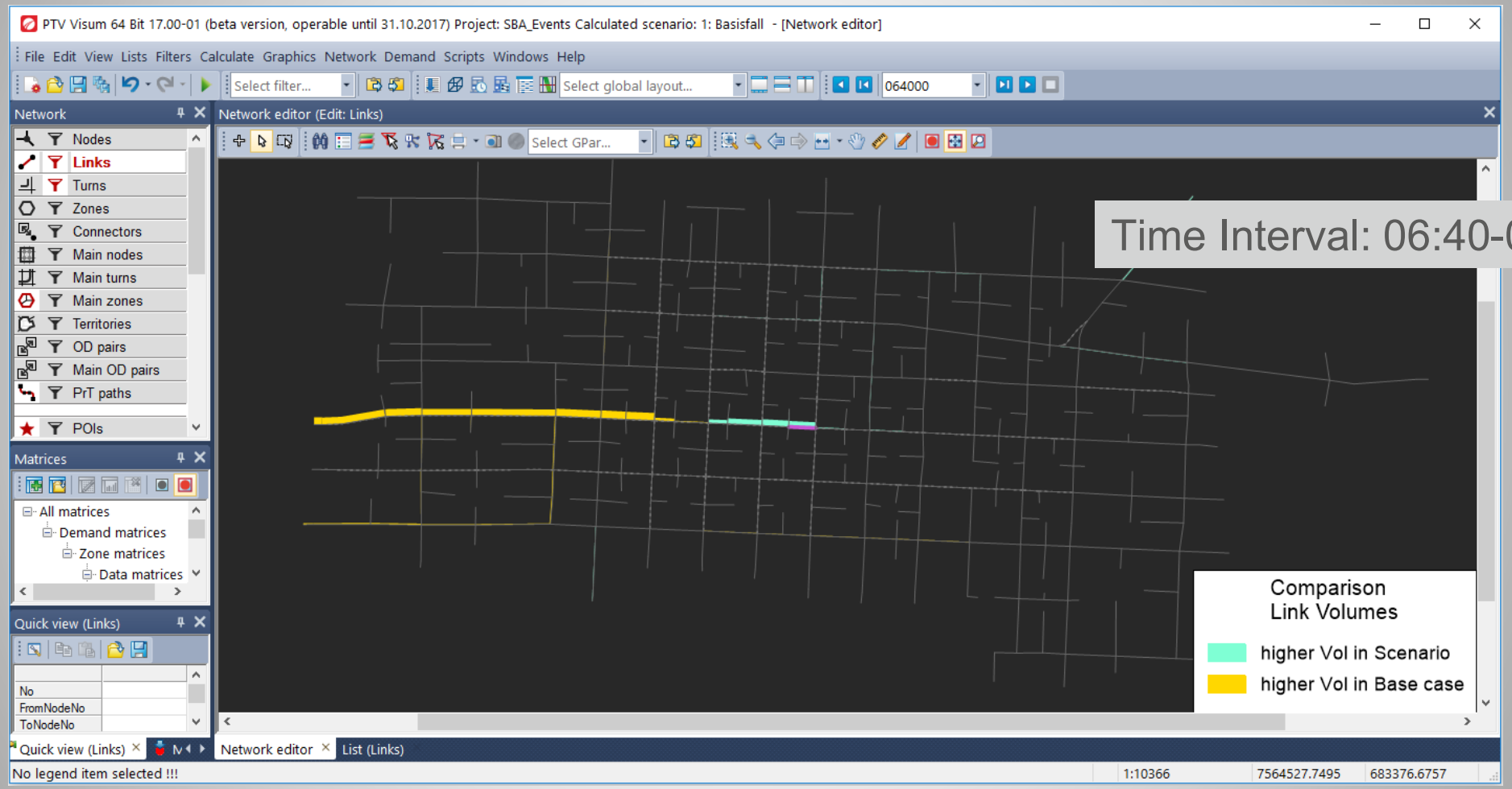
BASE CASE VS UNPLANNED EVENT: VOLUMES



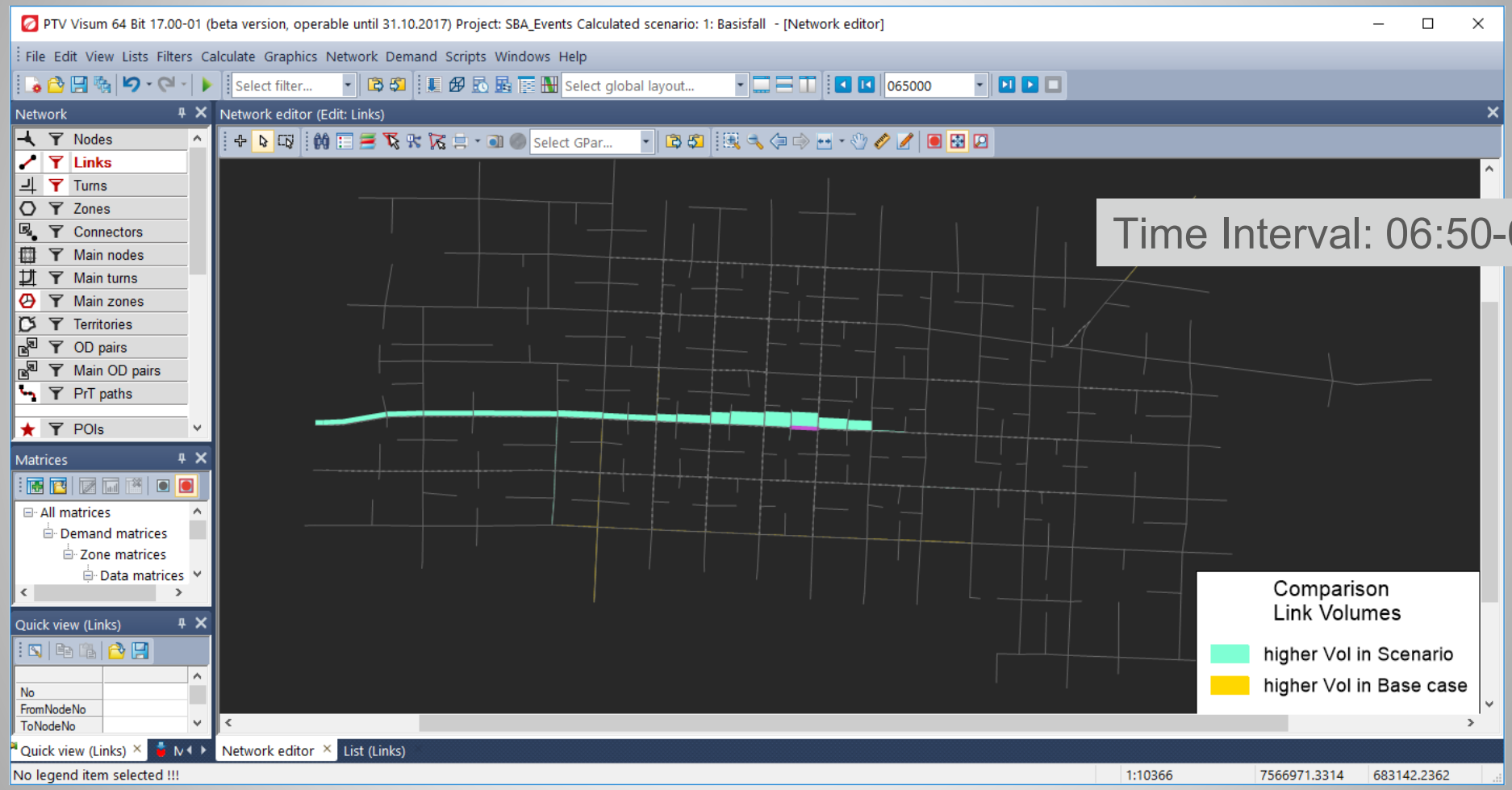
BASE CASE VS UNPLANNED EVENT: VOLUMES



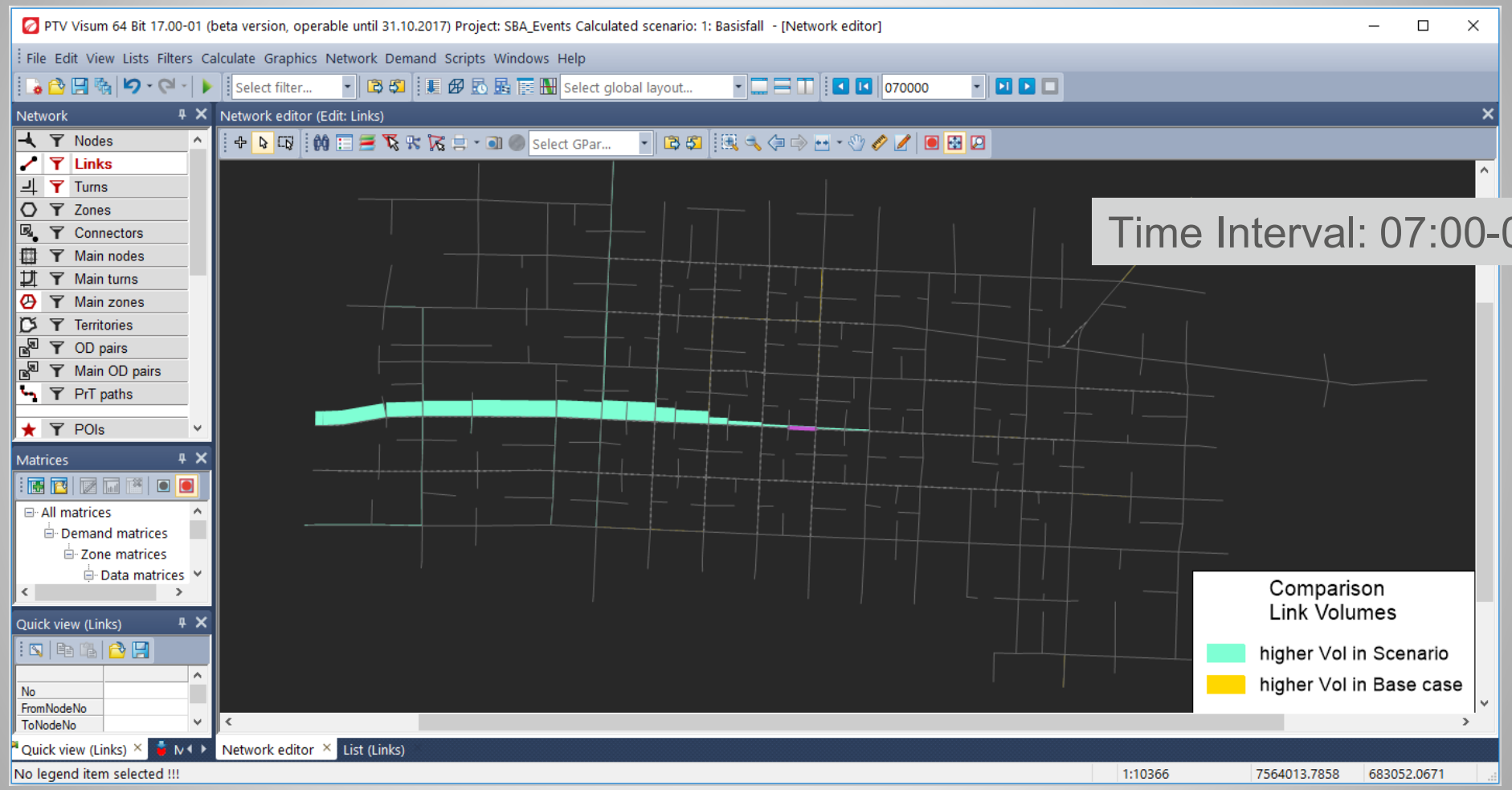
BASE CASE VS UNPLANNED EVENT: VOLUMES



BASE CASE VS UNPLANNED EVENT: VOLUMES



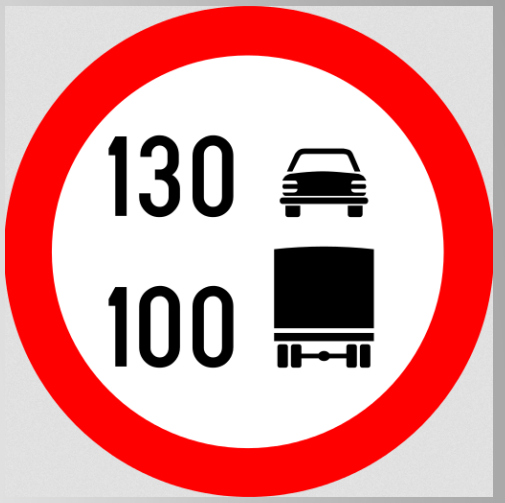
BASE CASE VS UNPLANNED EVENT: VOLUMES



EXTENSIONS SBA (2)

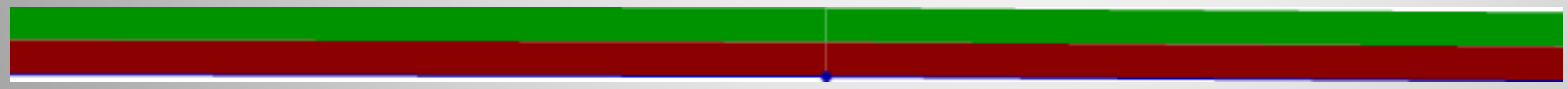
More realistic behavior on freeways

- 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

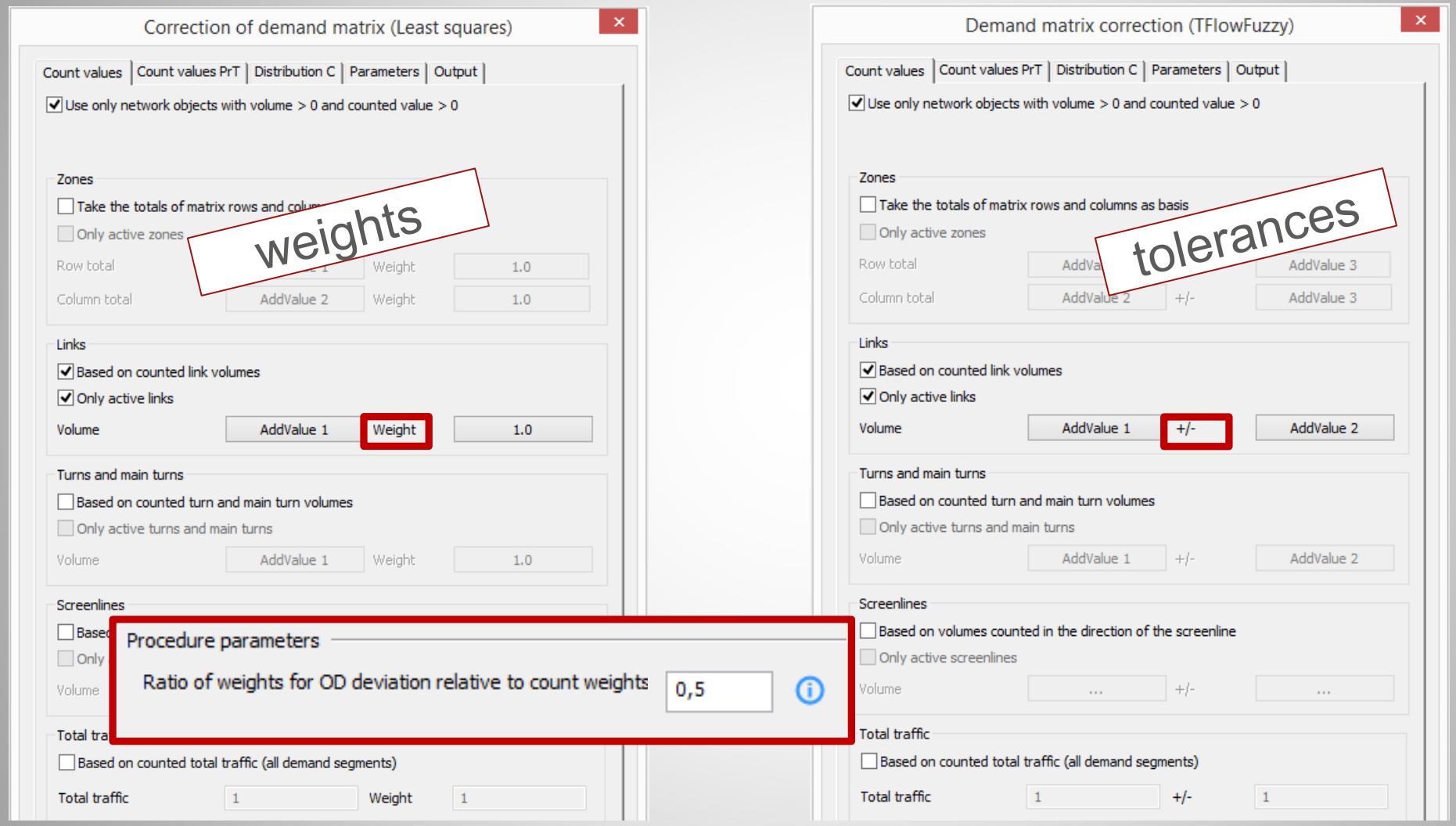
v_Car	115km/h
v_HGV	80km/h
Car	1000
HGV	1000



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



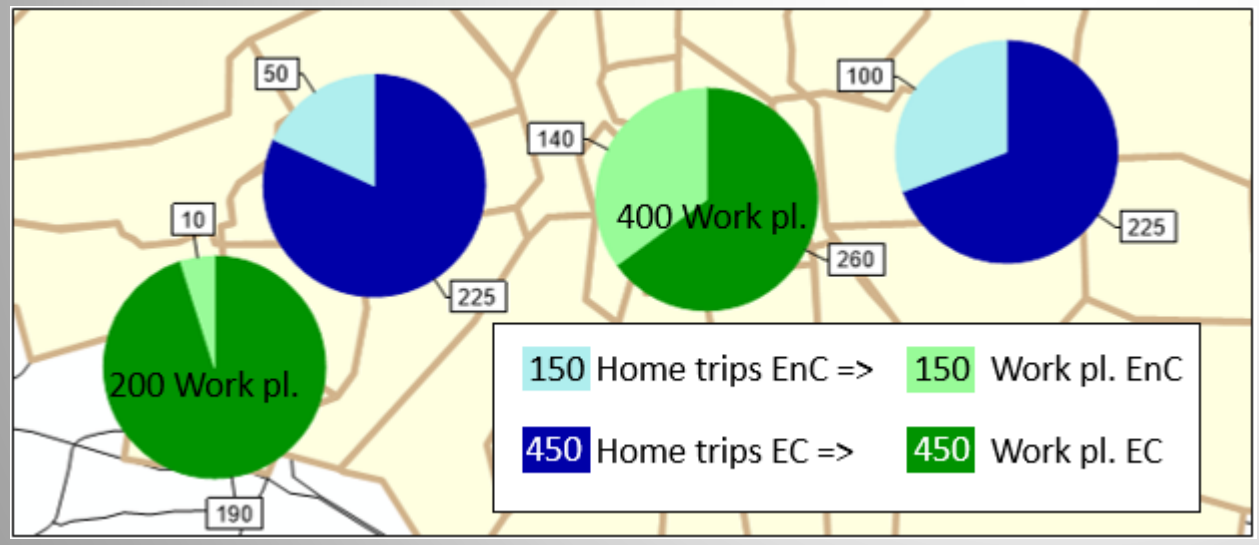
TOUR-BASED DEMAND MODEL: DISTRIBUTION ACROSS DEMAND STRATA

Objective:

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

Example:

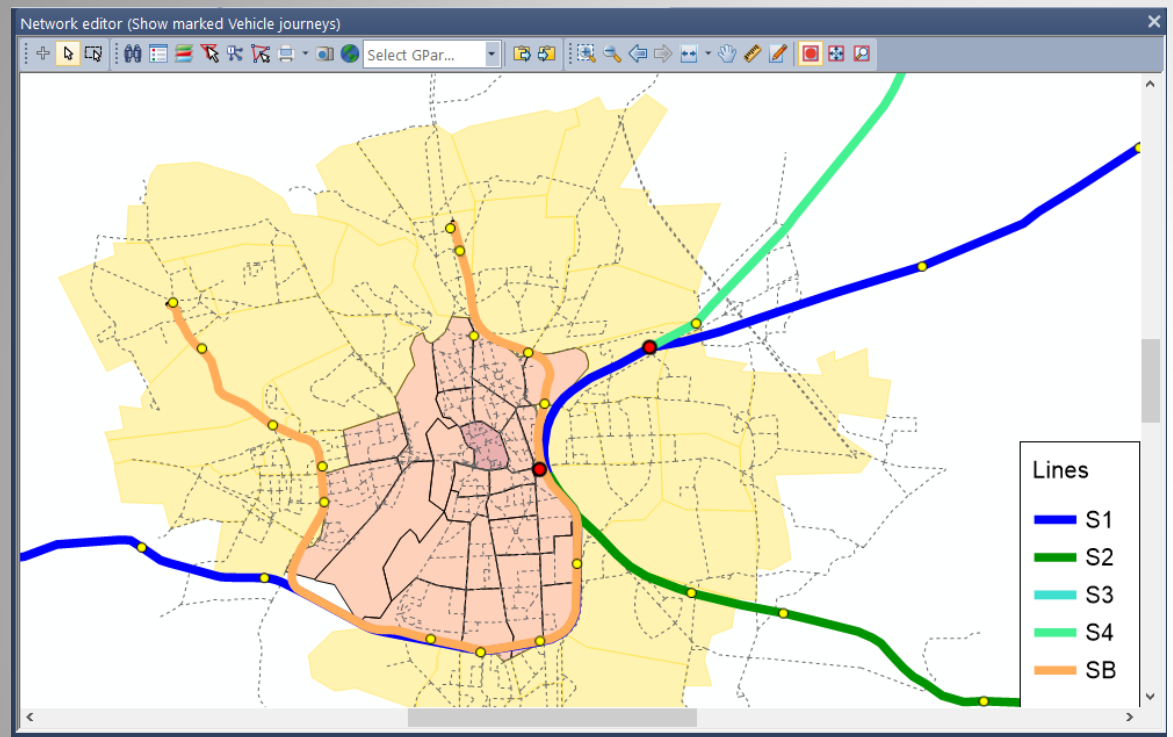
- 2 person groups employees with and without car (450 pers. / 150 pers.)
- 2 locations with work places (200 / 400)



New option under
Demand model > activities

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

ANALYSING CONNECTIONS



List (Connecting journeys)

Connections

Stop: All | Status: Reached and missed connecting journeys

Vehicle journey: 1136961 2 10:15:00 | Direction: Outbound connecting journeys

Show only connecting journeys between active vehicle journey items

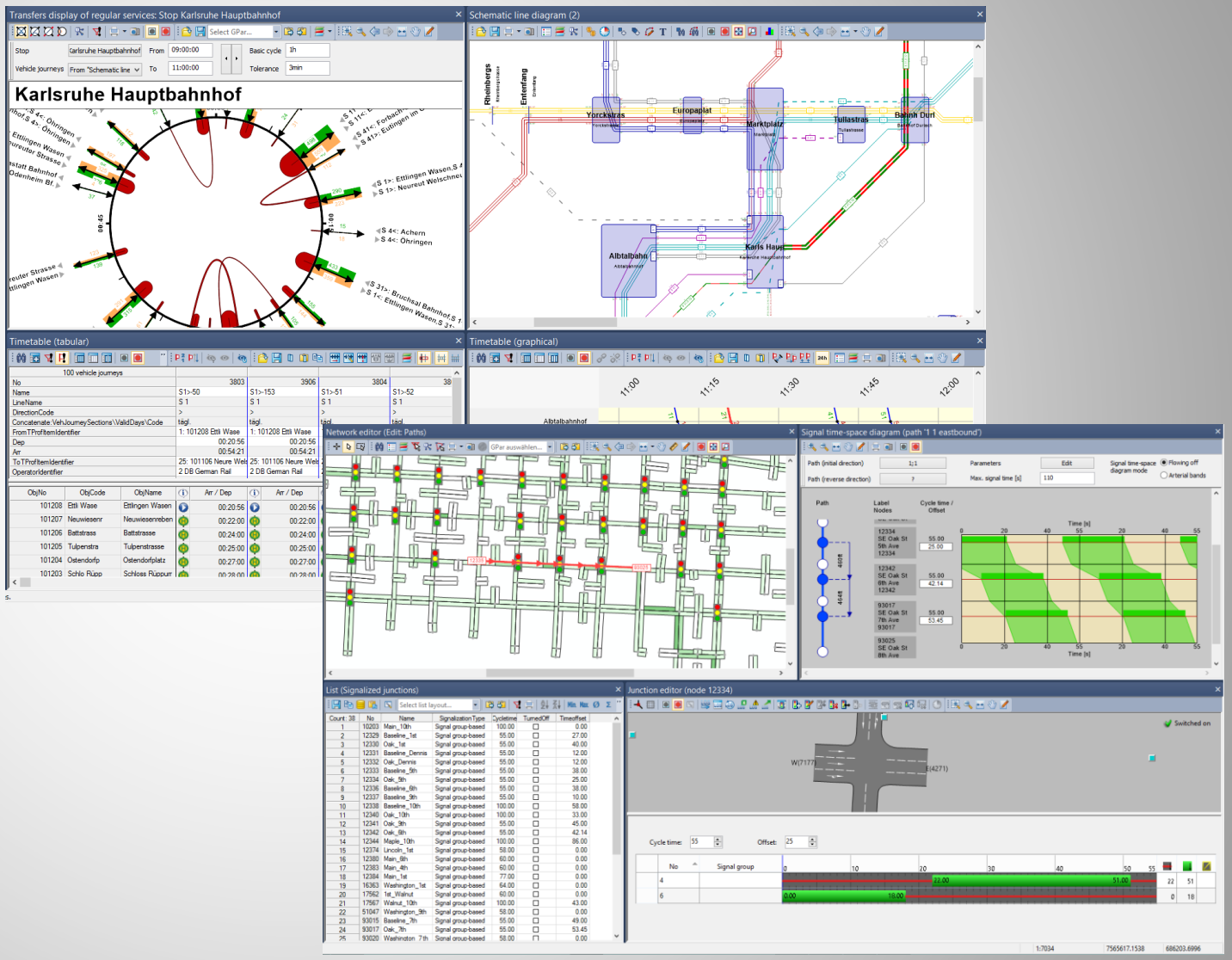
Count: 4	Stop\Name	FromVehJourneyIdentifier	Arr	Status	Dep	ToVehJourneyIdentifier	WaitTime
1	Central Station	1136961 (line: S1, name: 2)	11:00:00	Missed	10:58:00	1137004 (line: S2)	-2min
2	Central Station	1136961 (line: S1, name: 2)	11:00:00	Reached	11:03:00	1137029 (line: SB)	2min
3	Dautzsch	1136961 (line: S1, name: 2)	11:07:00	Reached	11:07:00	1137061 (line: S4)	0min
4	Bitterfeld	1136961 (line: S1, name: 2)	11:42:00	Missed	11:40:00	1136992 (line: S3)	-2min

Overview of connections

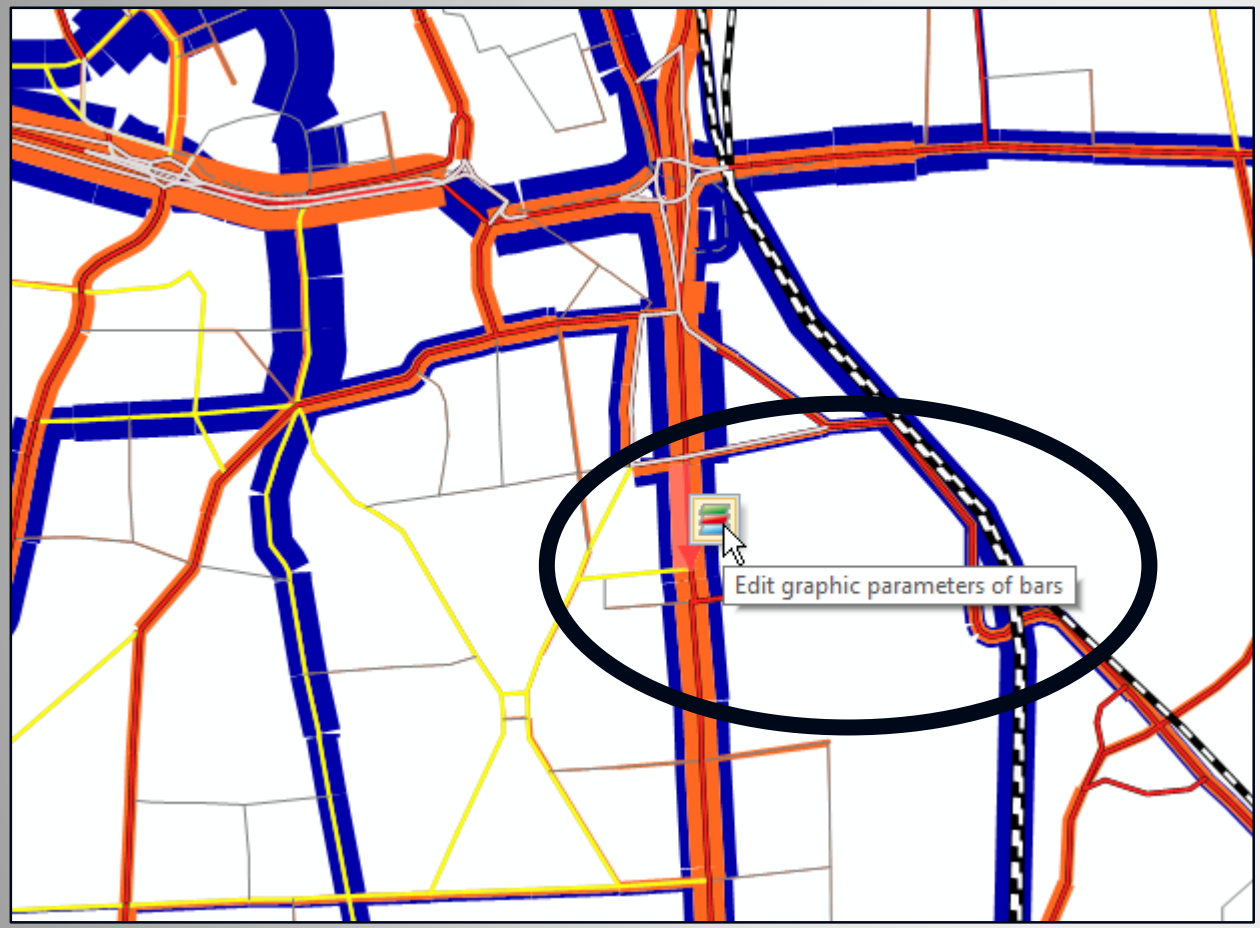
- new list: Connecting journeys
- connetions listed for stop or vehicle journey
- status: „Missed“ / „Reached“
- adjustable time window for max. wait time between connecting journeys
- synchronization
- easy to use in version comparison to highlight changes of missed and reached connections for different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

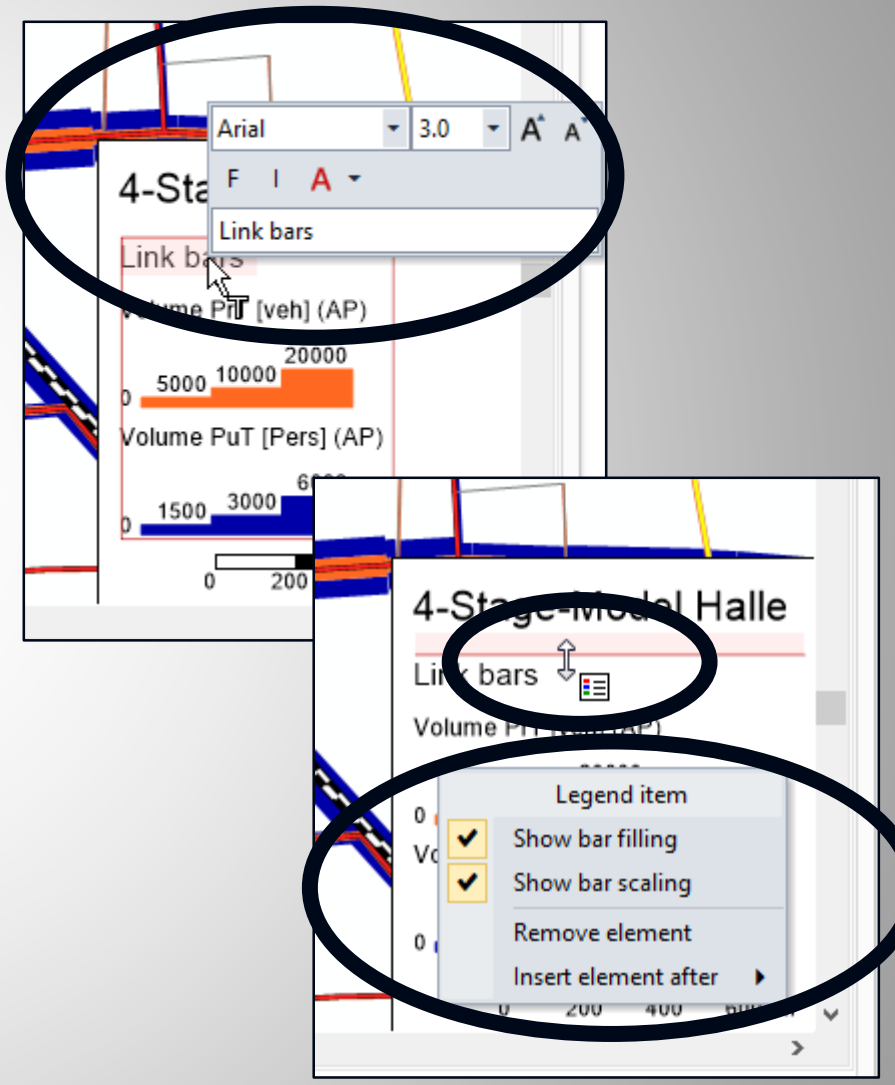
GLOBAL LAYOUT

- 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



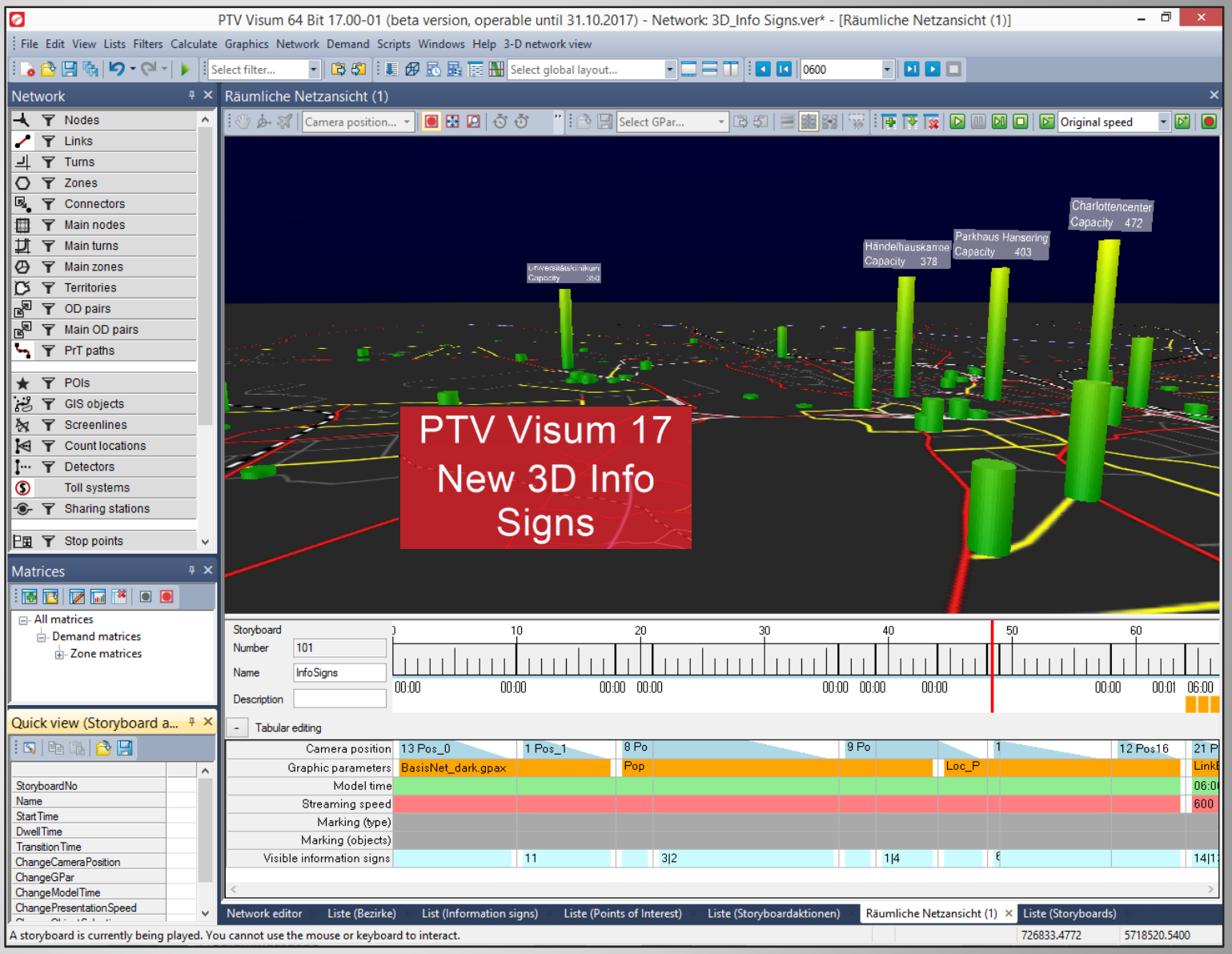
DIRECT EDITING OF LINK BARS AND LEGEND



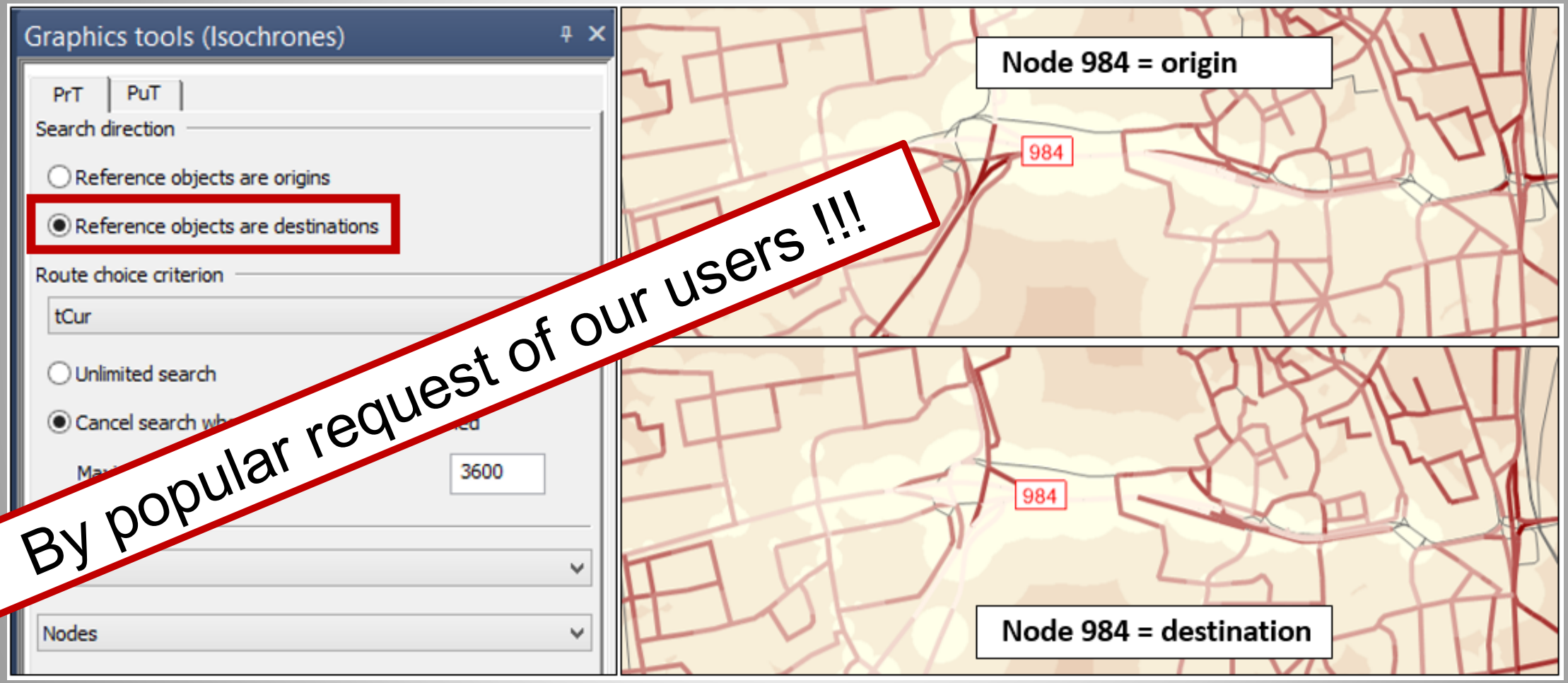


3D - INFO SIGNS

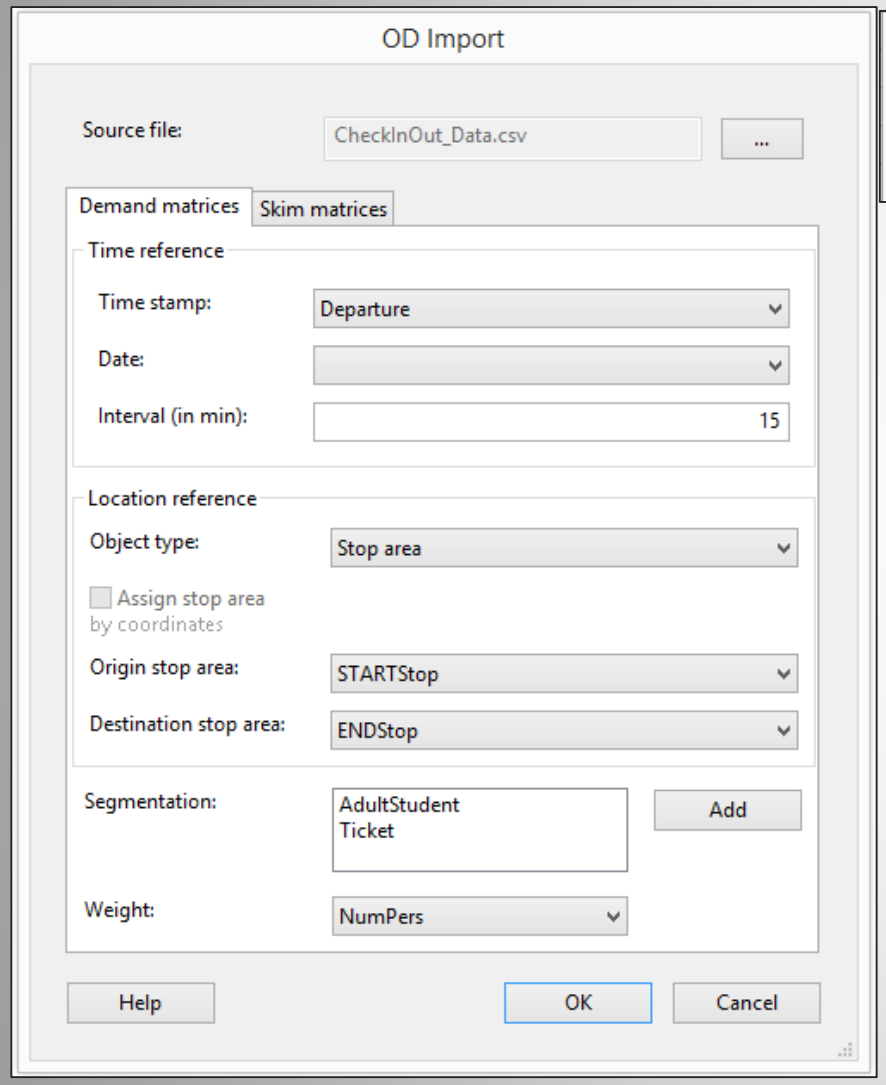
- info signs for labeling arbitrary network objects
- combination of free text and attribute values
- graphic design
  - size
  - alignment
  - rotation
  - show/hide via storyboard actions
  - ...



PRT ISOCHRONES BY DESTINATION



ADD-IN: OD IMPORT



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?

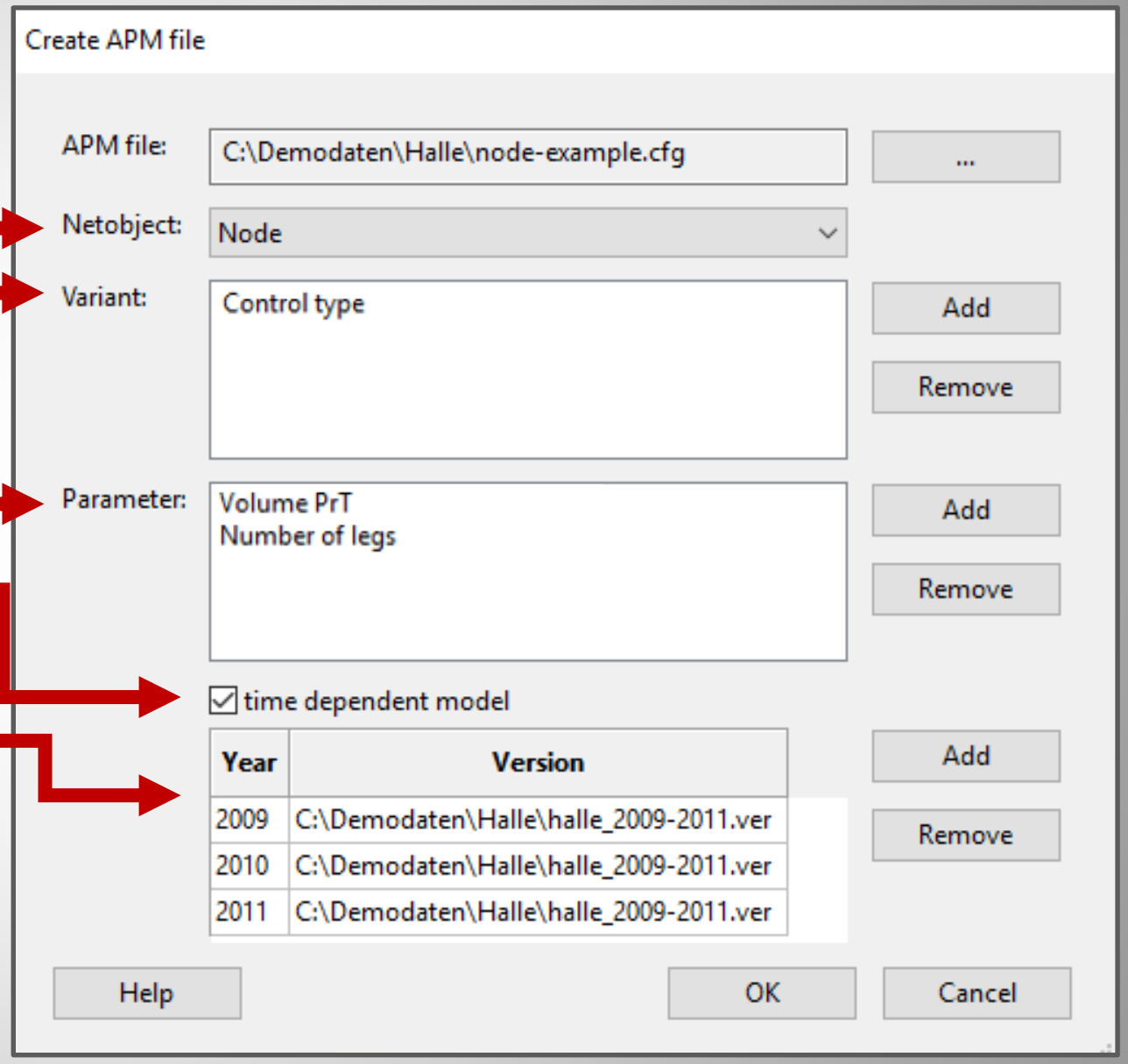
several models:
differentiation by attribute value

model variables: arbitrary attributes of selected network object types

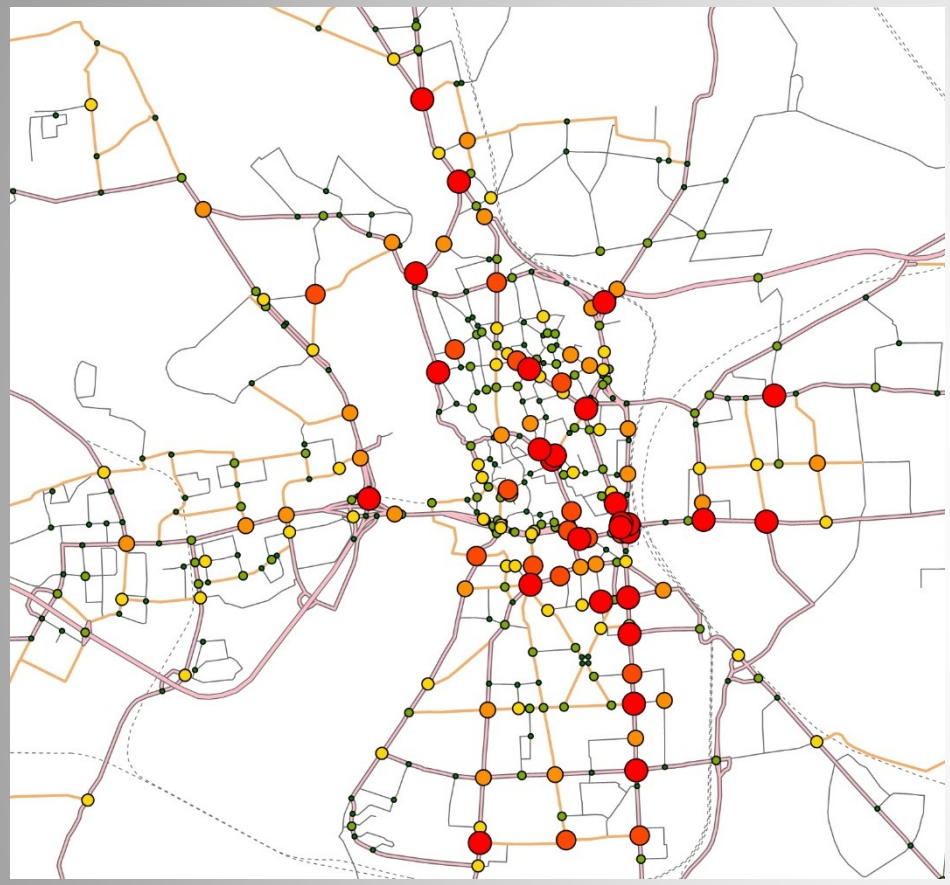
optional time-dependent model:

calendar year as additional model variable
optionally data for several years can be read from other files

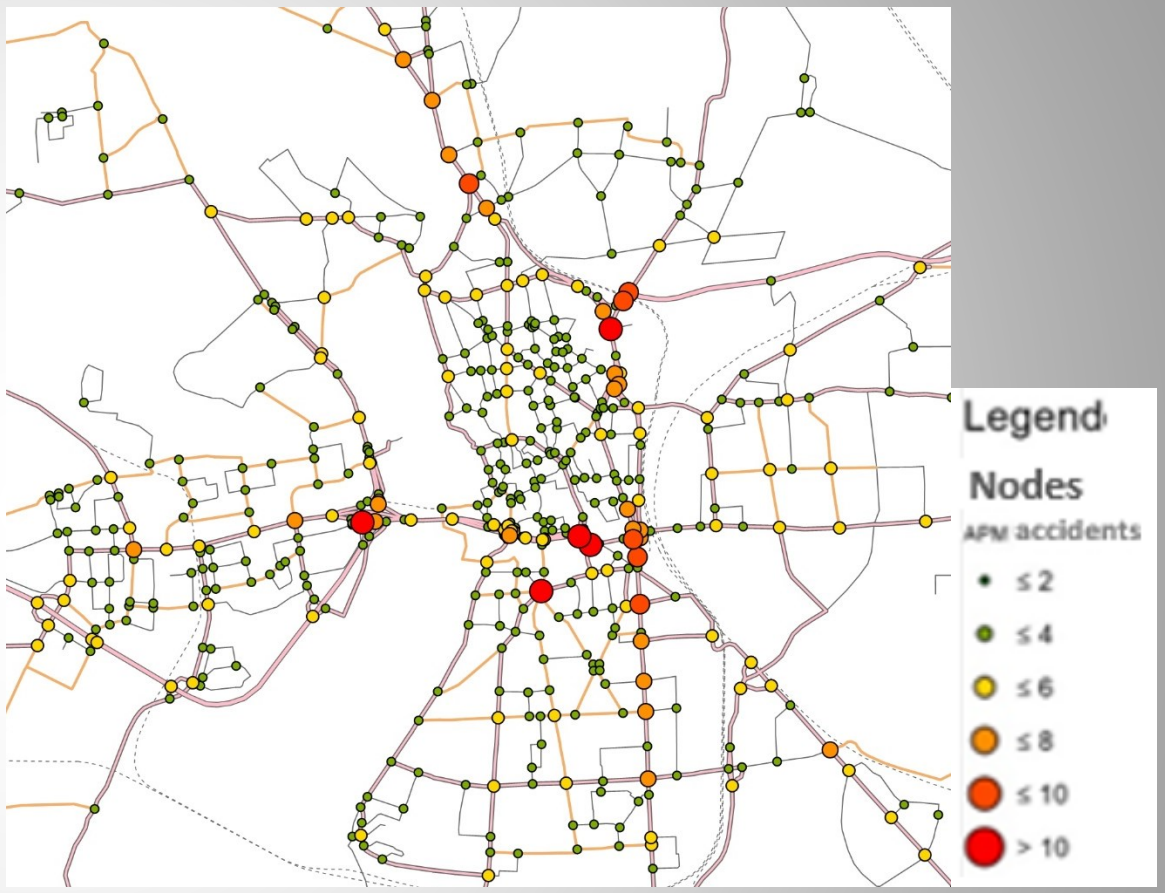
New Add-In ‘Generic Accident Model‘



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,…)

www.ptvgroup.com