



PTV GROUP

# Visum ActivitySim ABM Integration



**Metropolitan Washington Council of Governments**

March 24, 2023  
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# AGENDA

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- 01 Introduction
- 02 Select Visum ABM Users
- 03 ActivitySim-Visum Integration
- 04 ABM Output Analysis



01



Introduction

- The world's leading open platform for ABMs
- 20+ years of practical experience in ABM model development, software, and application
- The collective and on-going efforts of 10+ planning agencies with years of cooperation
- Includes PopulationSim for population synthesis
- Comprehensive, full scale, and validated ready-to-go templates for quick and easy setup



<https://activitysim.github.io>

- World's leading transportation planning software
- High-performance algorithms for quick and accurate results
- Detailed traffic flow simulation of large-scale transport networks
- Integrated activity-based demand modeling (ABM)



**PTV believes in the benefits of person-centric disaggregate ABMs and has been investing in PTV VISUM for several years to support this more powerful approach to modeling mobility.**

**Phase 1 for SBB, DVRPC, ODOT, others:** data structures and network skimming procedures

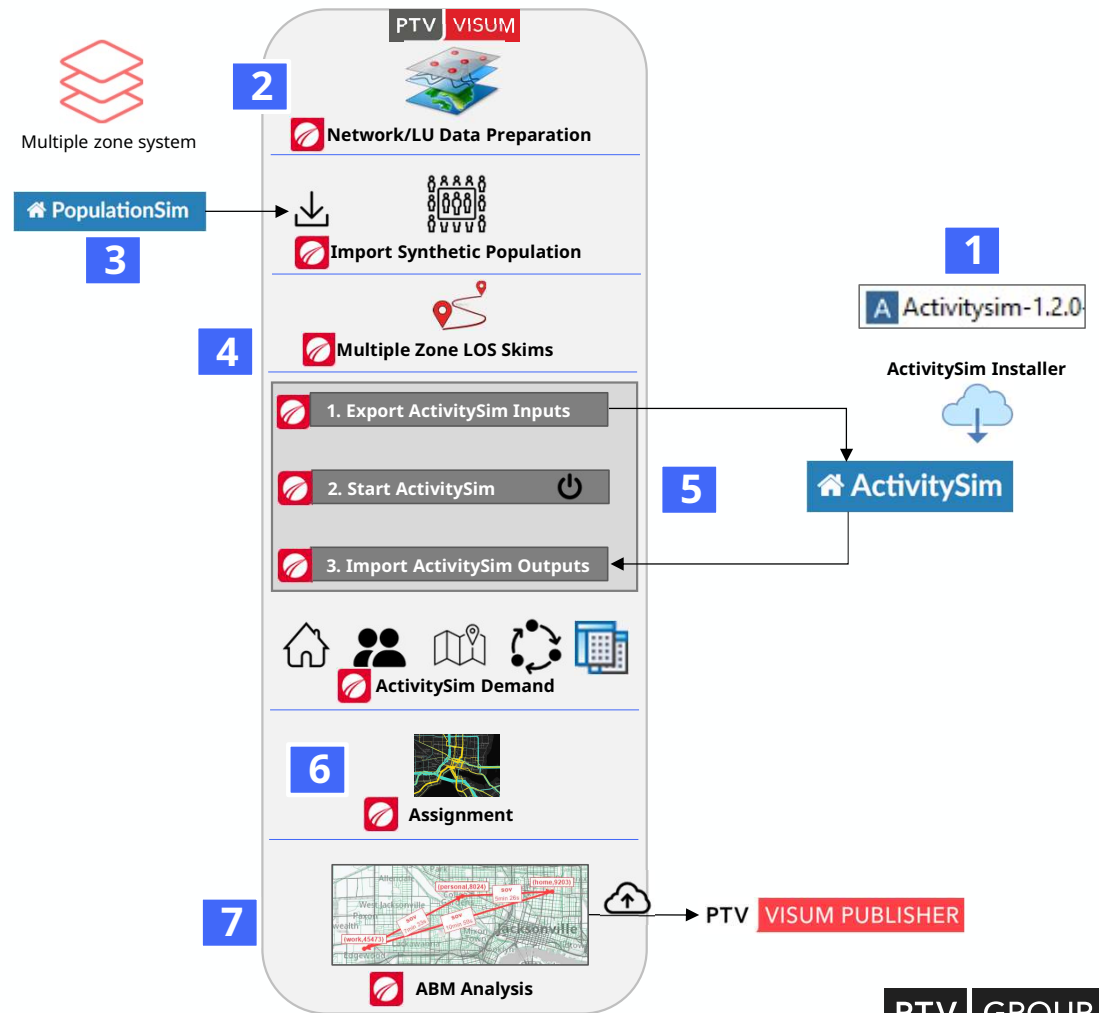
**Phase 2 for ActivitySim members, RTA, others:** integration with ActivitySim

# PTV VISUM 2023 Release

## Visum – ActivitySim Integration



- ActivitySim Installer
- Direct import from PopulationSim
- Multiple zone system and skimming
- ABM data structures
  - ✓ Locations, households, persons, tours, and trips
- ActivitySim interface in Visum UI
  - ✓ Export ActivitySim inputs
  - ✓ Run ActivitySim
  - ✓ Import ActivitySim outputs
- Assign path probabilities to individual trips
- Integrated data management



02

Select Visum  
ABM Users

# Select Visum ABM Users

## ■ Swiss Federal Railway (SBB)

- Switzerland national rail planning model
- 8mi+ persons; Visum Python-based ABM + matsim



## ■ Delaware Valley Regional Planning Commission (DVRPC)

- Philadelphia MPO regional planning model
- 6mi+ persons; PopulationSim + DaySim ABM



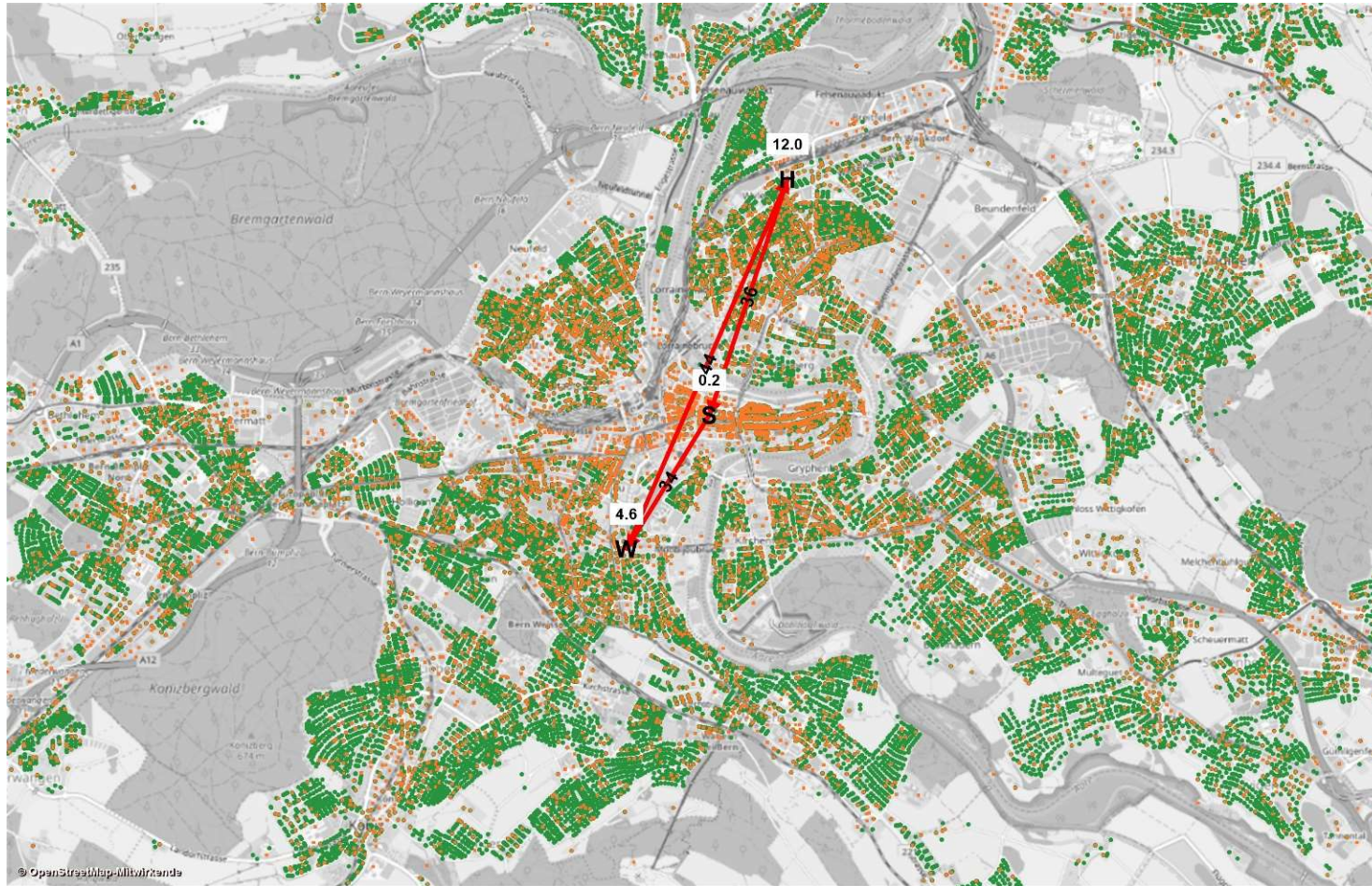
## ■ Oregon Department of Transportation (ODOT)

- Southern Oregon MPOs regional planning model
- 300k+ persons; PopulationSim + CT-RAMP ABM





# Select Visum ABM Users: SBB CFF FFS



## Tracing tours in Visum

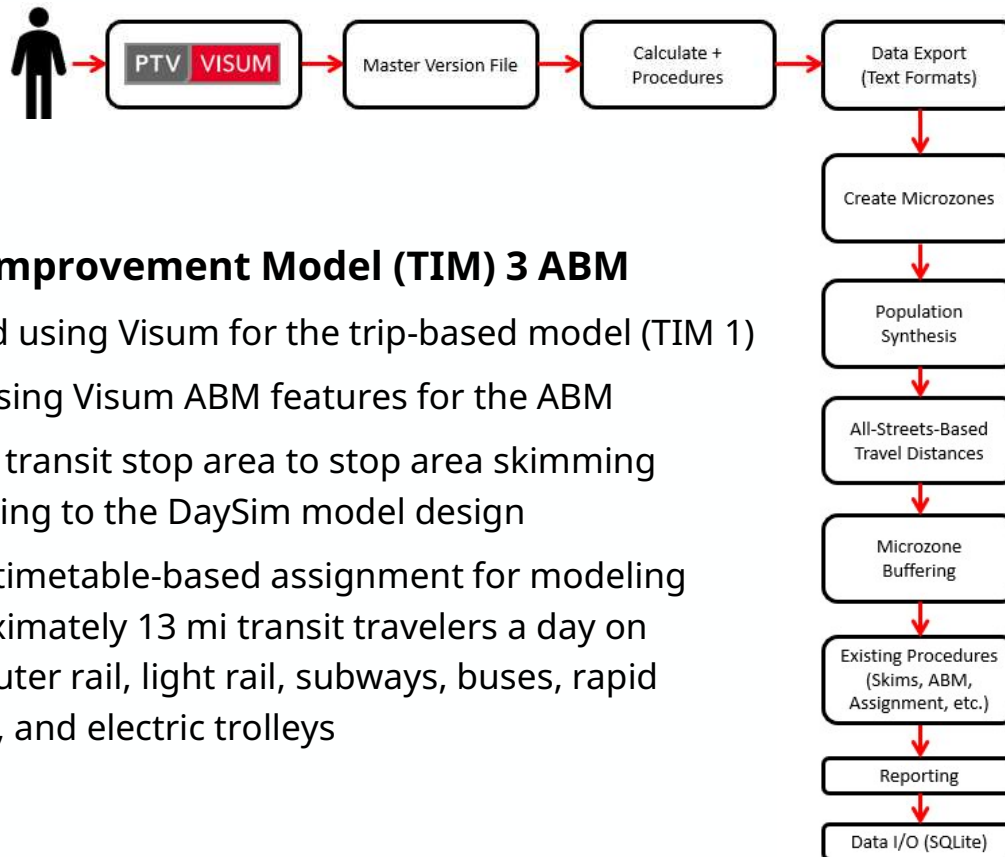
### ■ Details

- ID = 1352391
- Status = Employee
- Tour = H-S-W-H

### ■ Activities

- H = home
- W = work
- E = education
- S = shopping
- L = leisure
- A = accompany/escort
- O = other

# Select Visum ABM Users:



## ■ Travel Improvement Model (TIM) 3 ABM

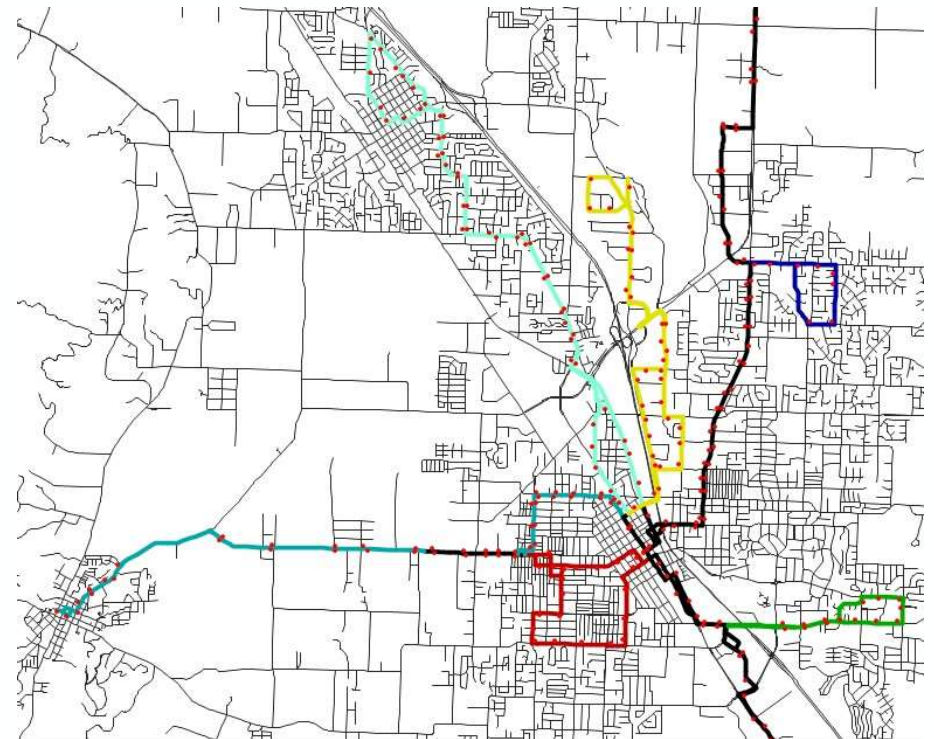
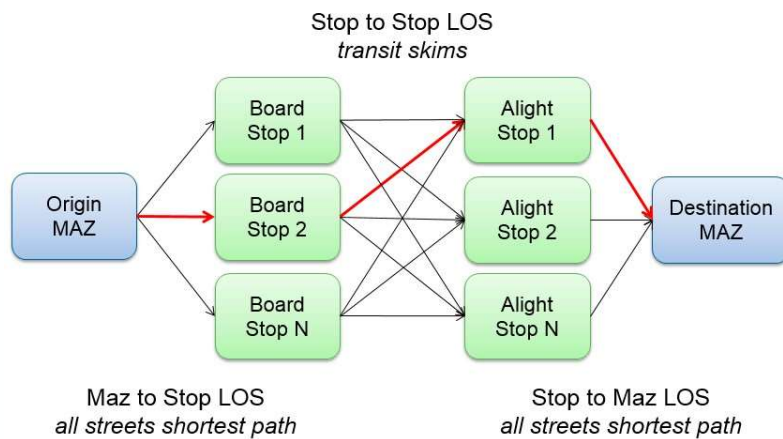
- Started using Visum for the trip-based model (TIM 1)
- Now using Visum ABM features for the ABM
- Added transit stop area to stop area skimming according to the DaySim model design
- Using timetable-based assignment for modeling approximately 13 mi transit travelers a day on commuter rail, light rail, subways, buses, rapid transit, and electric trolleys

# Select Visum ABM Users:



## ■ ODOT SOABM for RTP planning

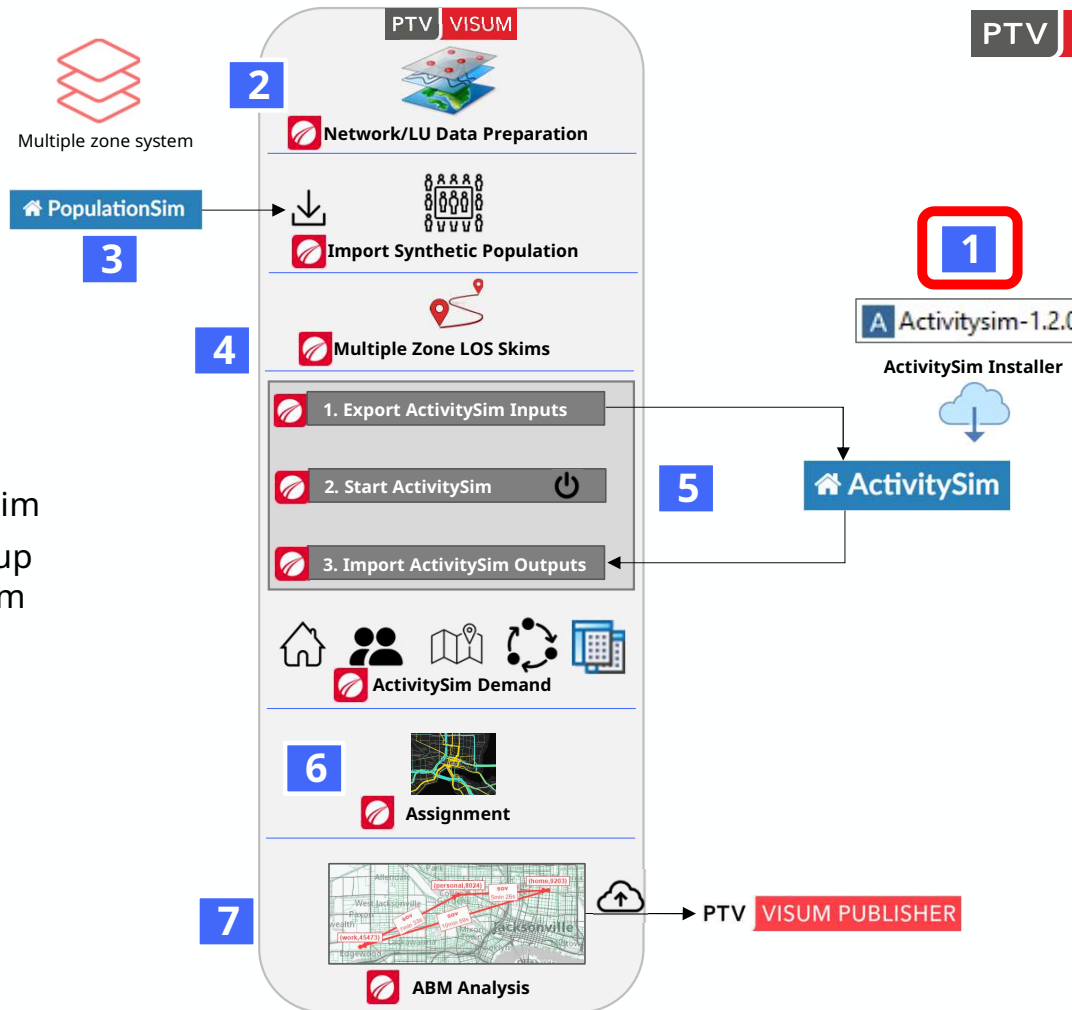
- Includes Visum transit stop area to stop area skims for three-zone system ABM design
- Includes transit virtual path building (TVPB) in the ABM



03

ActivitySim Visum  
Integration

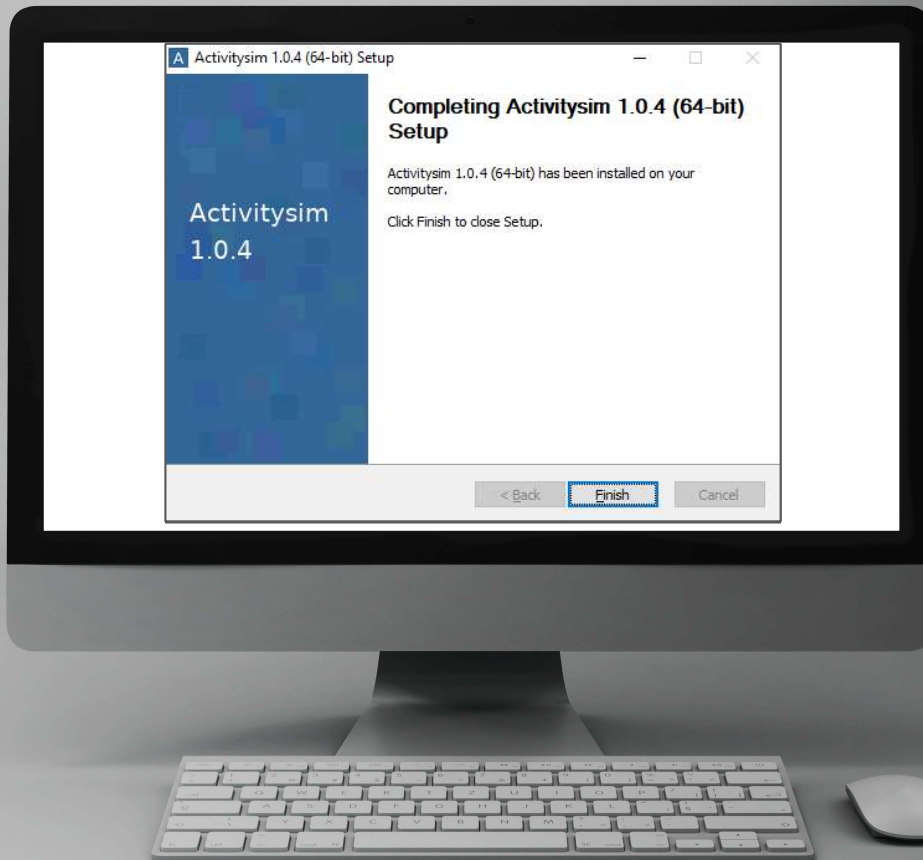
# Visum - ActivitySim Integration



## ActivitySim Installer

- Download from ActivitySim
- Ensures a consistent setup for integration with Visum

# Installing ActivitySim



- Run the downloaded installer
- Keep default settings if not an advanced user
- Note the installation location
- Creating a custom environment not necessary

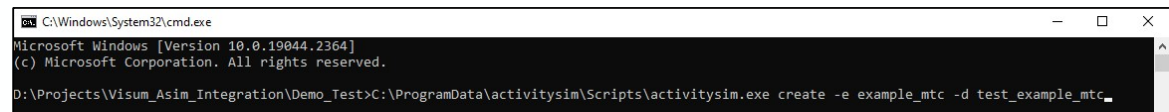
# ActivitySim Installer

## Accessing ActivitySim Examples

- Follow the instructions from ActivitySim User's Guide
  - Use the installed ActivitySim executable
  - Check if the example is available in the installed version of ActivitySim

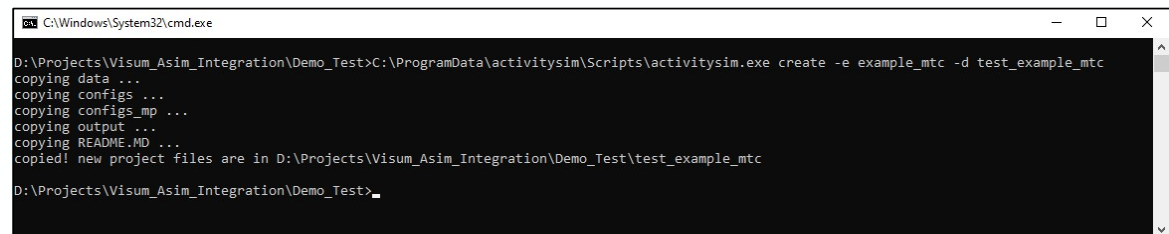
1. Open a CMD window in the target directory and run the following command:

```
C:\ProgramData\activitysim\Scripts\activitysim.exe create -e example_mtc -d test_example_mtc
```



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19044.2364]
(c) Microsoft Corporation. All rights reserved.
D:\Projects\Visum_Asim_Integration\Demo_Test>C:\ProgramData\activitysim\Scripts\activitysim.exe create -e example_mtc -d test_example_mtc_
```

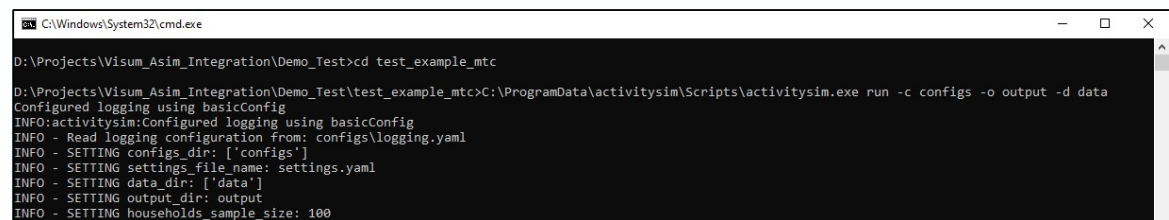
2. Example setup gets copied to the target directory:



```
C:\Windows\System32\cmd.exe
D:\Projects\Visum_Asim_Integration\Demo_Test>C:\ProgramData\activitysim\Scripts\activitysim.exe create -e example_mtc -d test_example_mtc
copying data ...
copying configs ...
copying configs_mp ...
copying output ...
copying README.MD ...
copied! new project files are in D:\Projects\Visum_Asim_Integration\Demo_Test\test_example_mtc
D:\Projects\Visum_Asim_Integration\Demo_Test>
```

3. Run the example from the CMD using the following command:

```
C:\ProgramData\activitysim\Scripts\activitysim.exe run -c configs -o output -d data
```

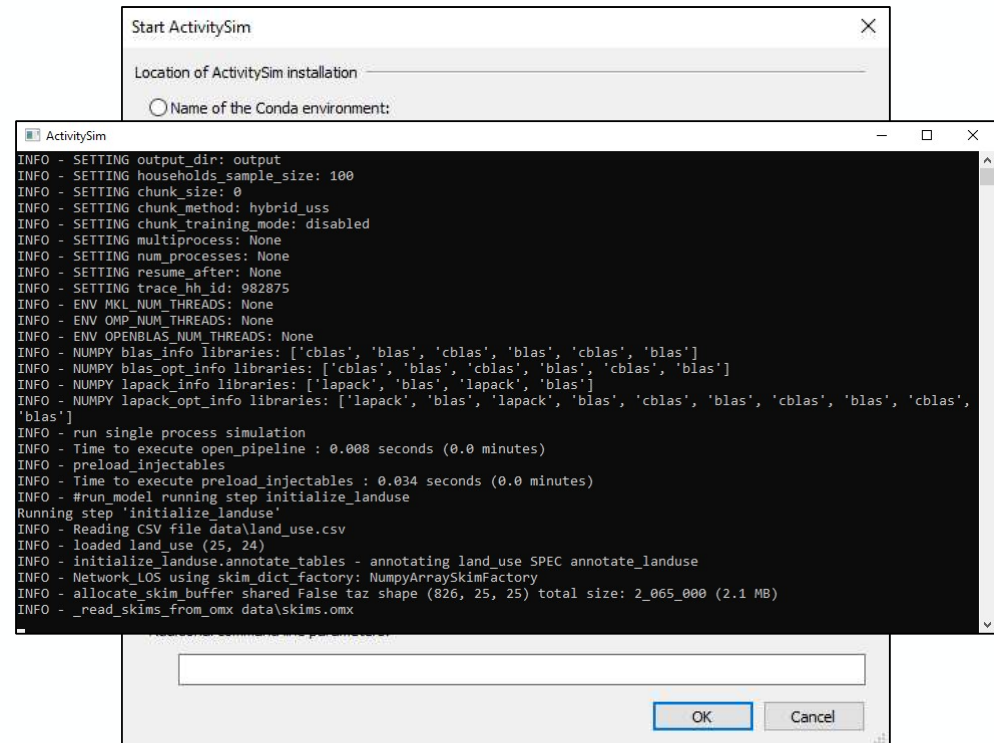


```
C:\Windows\System32\cmd.exe
D:\Projects\Visum_Asim_Integration\Demo_Test>cd test_example_mtc
D:\Projects\Visum_Asim_Integration\Demo_Test\test_example_mtc>C:\ProgramData\activitysim\Scripts\activitysim.exe run -c configs -o output -d data
Configured logging using basicConfig
INFO:activitysim:Configured logging using basicConfig
INFO - Read logging configuration from: configs\logging.yaml
INFO - SETTING configs_dir: ['configs']
INFO - SETTING settings_file_name: settings.yaml
INFO - SETTING data_dir: ['data']
INFO - SETTING output_dir: output
INFO - SETTING households_sample_size: 100
```

# ActivitySim Installer

## Running the Example from Visum

- Add a “Start ActivitySim” procedure
- Point to installed ActivitySim location
- Configure directories
- Run procedure



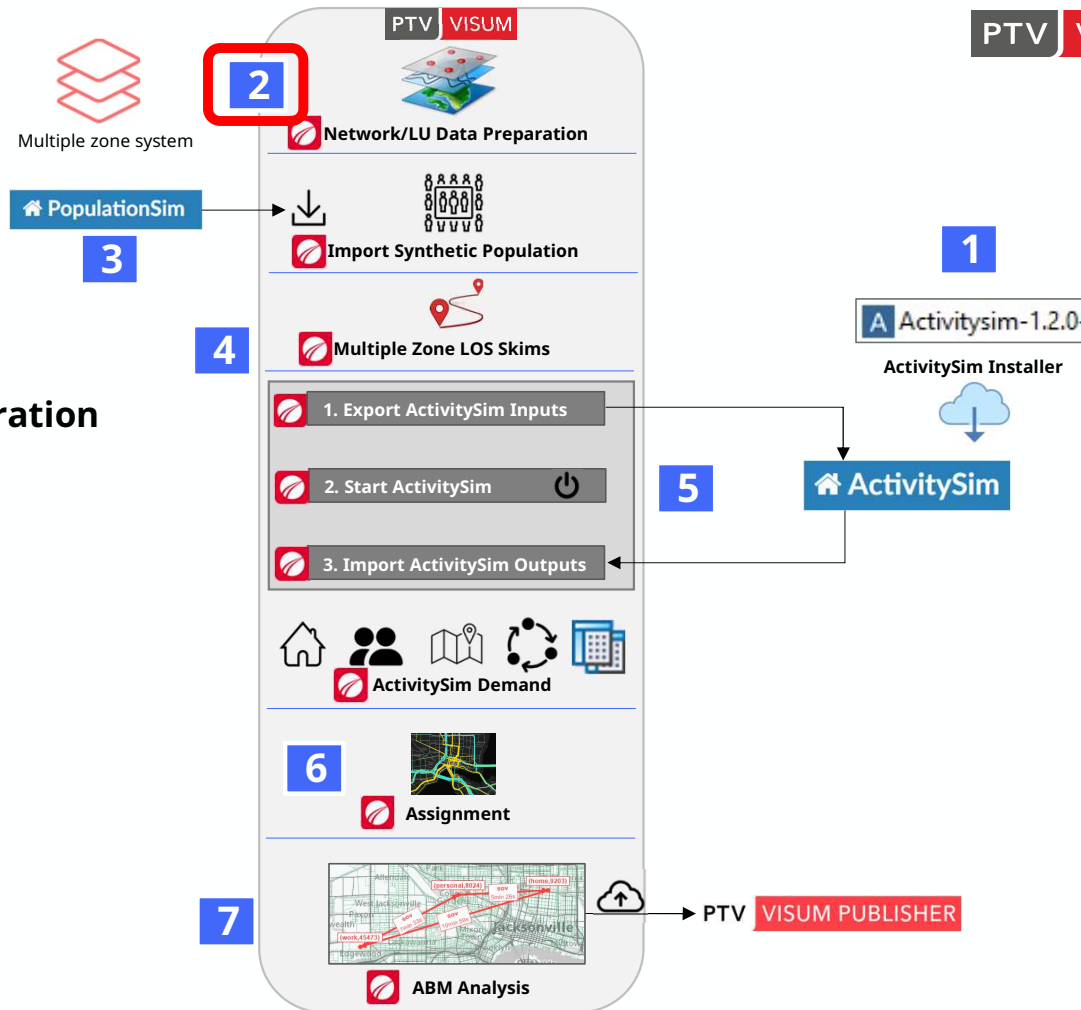


# Visum - ActivitySim Integration



## Network/LU Data Preparation

- Zone systems
- Data management



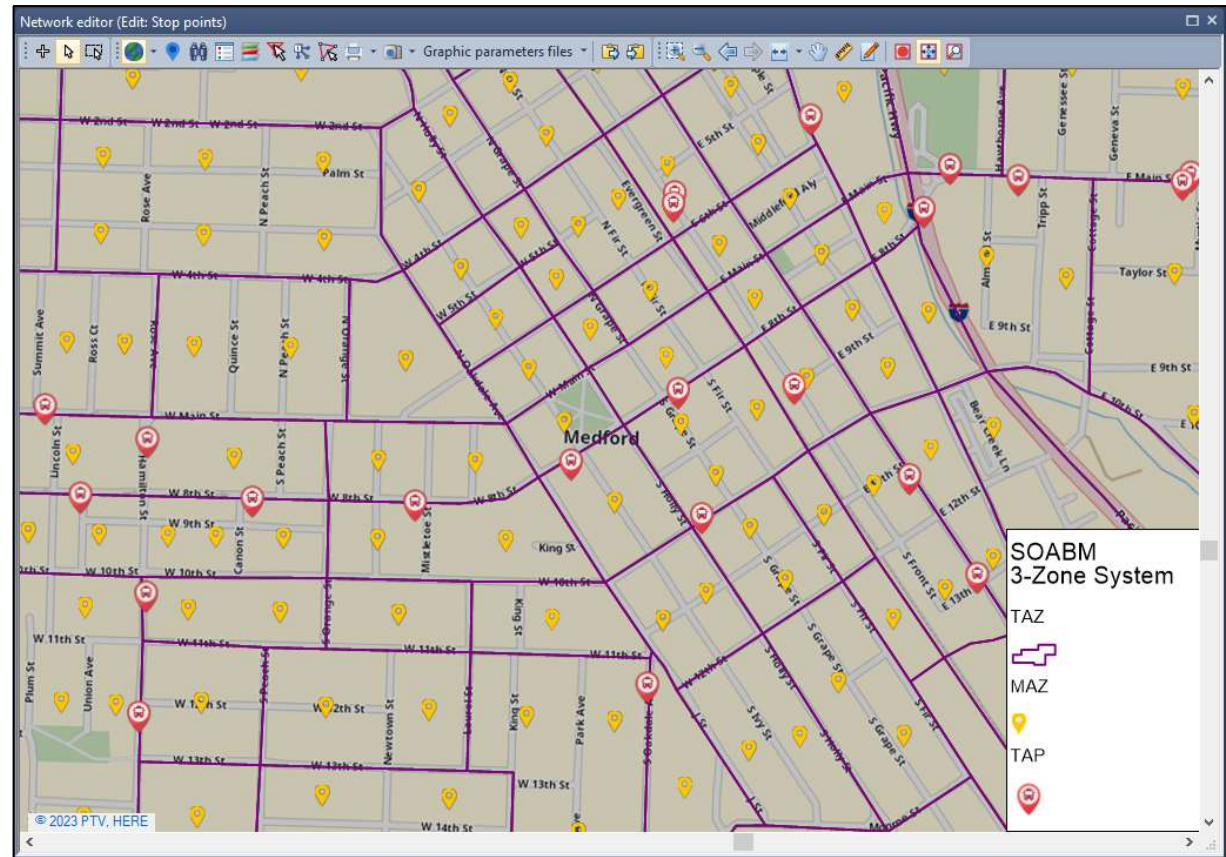
# Multiple Zone System

ActivitySim works with multiple zone system configurations

Zone System	Geographies	Example
One	TAZ	MTC TM1
Two	TAZ, MAZ	Jacksonville
Three	TAZ, MAZ, TAP	SOABM

Representation of ActivitySim geographies in Visum

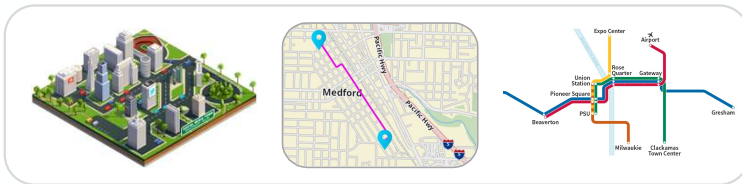
ActivitySim Geography	Visum Network Object
TAZ	Zones
MAZ	Disaggregate Locations (xy)
TAP	Stop Areas



TAZ: Traffic Analysis Zone, MAZ: Micro Analysis Zone, TAP: Transit Access Point

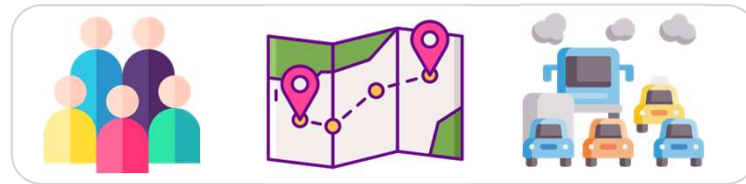
# Managing Data for ActivitySim

## ABM Supply Data



- Auto network
- Transit network
- Land use data

## ABM Demand Data

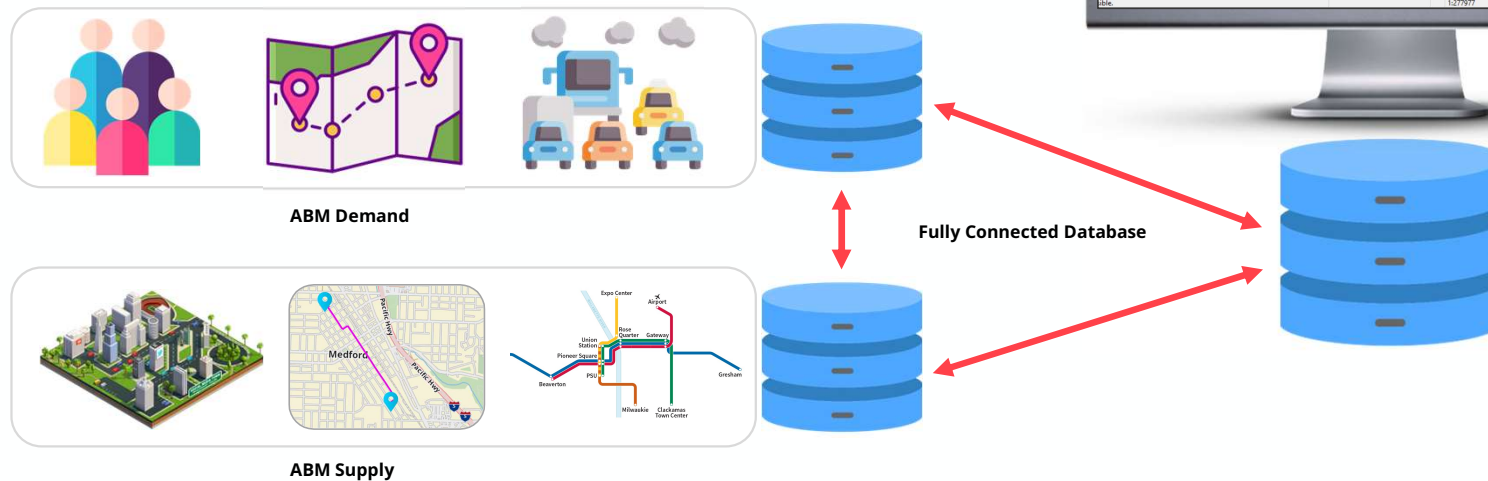


- Households & persons
- Activities
- Tours & trips

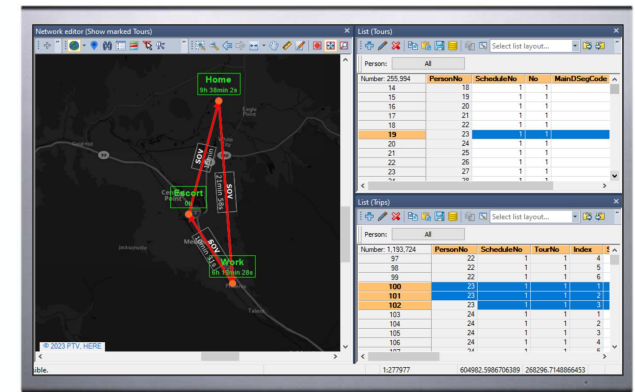
PTV Visum provides an integrated demand and supply data model for efficient and user-friendly management of all model data

# Integrated Demand and Supply Data Model

- First-of-its-kind in the market!
- Manage the disaggregate demand and supply data at the same time using the integrated data model
- Relational database with advanced features to edit and visualize data



Integrated Supply/Demand Data Model



# Demand Objects for ABM

Relational data tables store disaggregate model components as objects

- Locations
- Activity Locations
- Households
- Persons
- Schedules
- Activity Executions
- Tours
- Trips

The screenshot displays the PTV Visum Expert 2023 software interface. The main window shows a network editor with a map of a region including locations like Eagle Point, White Eye, and Medford. A red path is highlighted on the map, connecting several activity locations: Home (7h 32min 9s), Work (8h 38min 58s), and Shop (1h). The path is labeled with SOV (Service of Vehicle) and duration values.

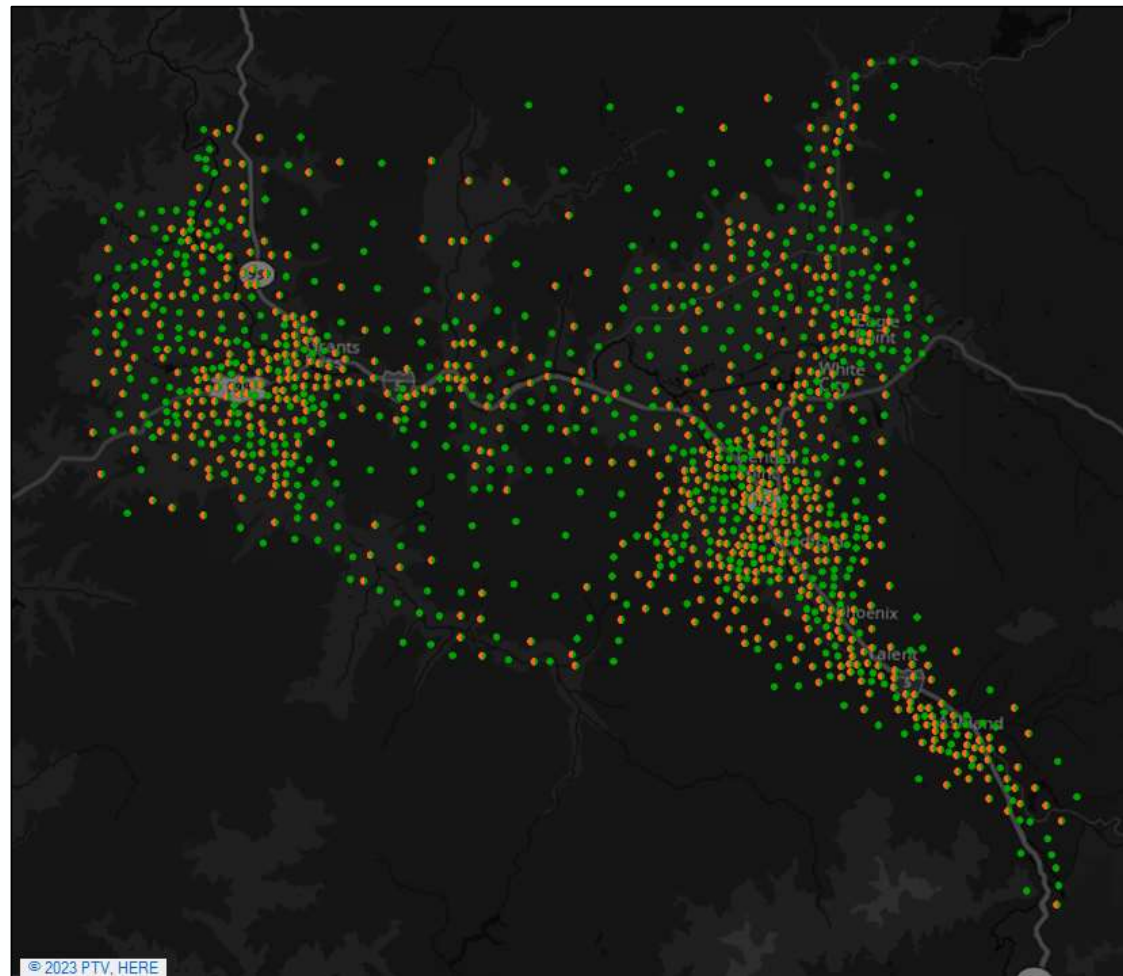
Below the map, there are three data tables:

- List (Person):** A table with columns: Number, No, HouseholdNo, Index, LongTermChoiceKeys, XCoord, YC. It lists 47 persons with their respective household numbers and coordinates.
- List (Trips):** A table with columns: PersonNo, ScheduleNo, TourNo, Index, SchedDepTime, Duration, SchedArrTime, DSegCode, FromActivityExecution, ToActivityExecution. It shows 147 trips for various persons and schedules.
- List (Tours):** A table with columns: PersonNo, ScheduleNo, No, MainDSegCode, IsValid. It lists 36 tours for different persons and schedules.

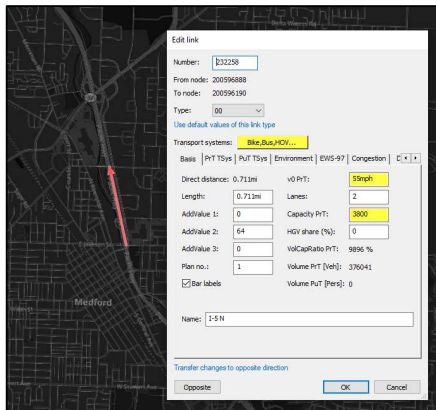
## Example – Home and Work Locations in Southern Oregon



Process ABM demand to generate validation summaries and charts

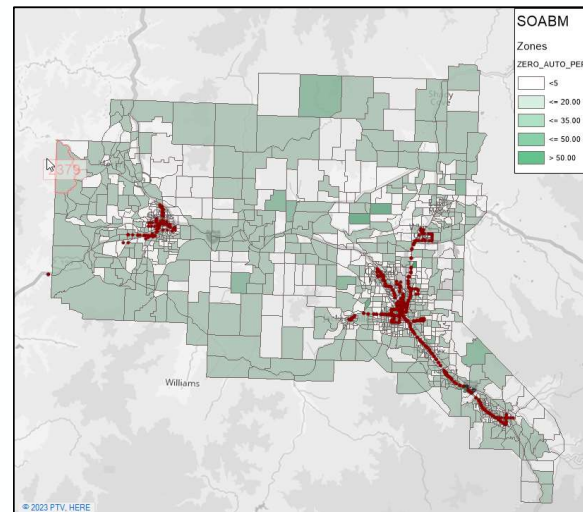


# Key Features of Visum Data Model



## Interactive Editing

- Spatial data changes are passed down to connected databases



## Connect Supply & Demand

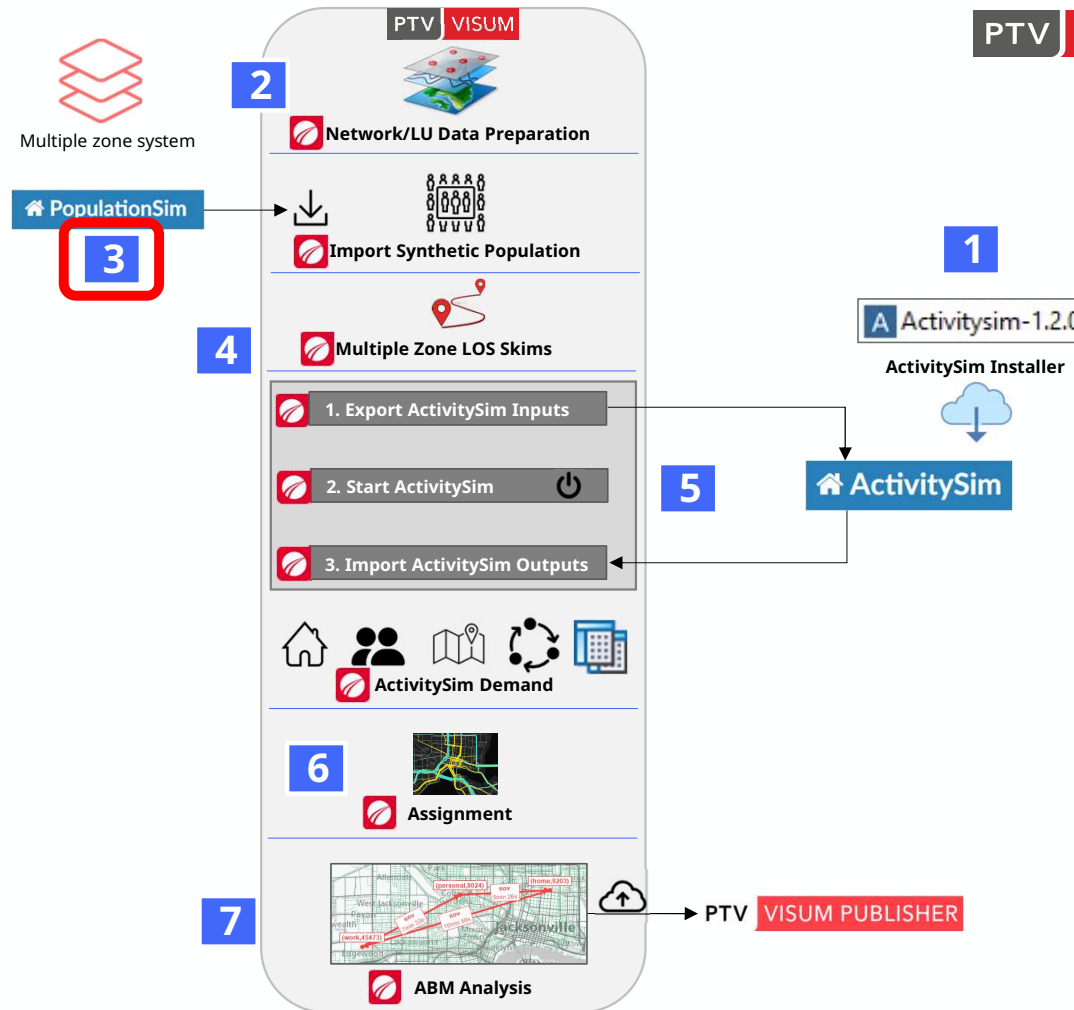
- Create validation summaries using supply and demand data

Number: 6	Grp(VEH)	Count(No)	Avg(HHINCADJ)	Max(NP)
1	1	45183	26735	12
2	2	41211	63131	9
3	3	15856	80042	9
4	4	4218	85106	8
5	5	1512	62326	9
6	6	2172	70260	6

## RDBMS Style Processing

- Perform filter, join, group-by, and aggregation operations on supply and demand data tables

# Visum - ActivitySim Integration

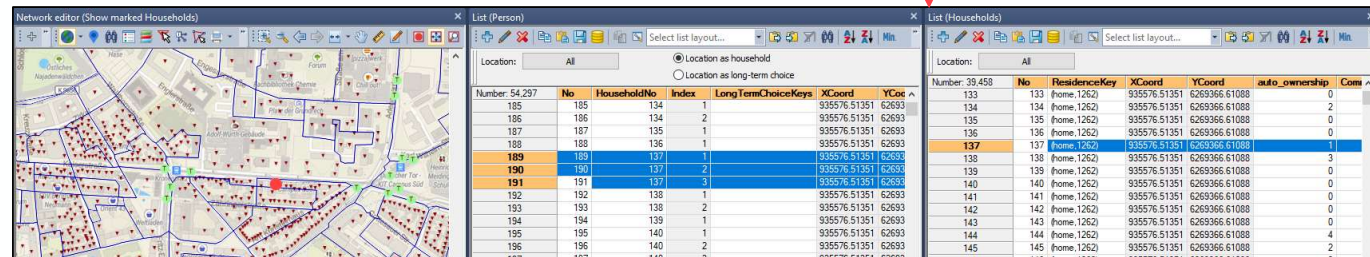
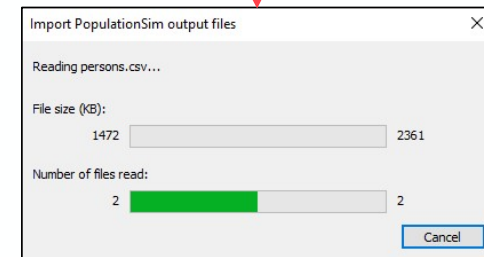
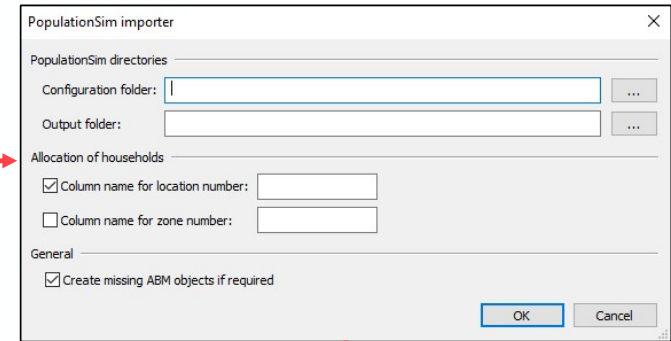
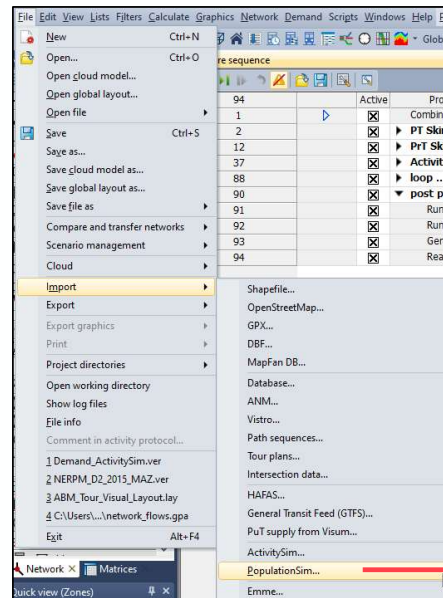




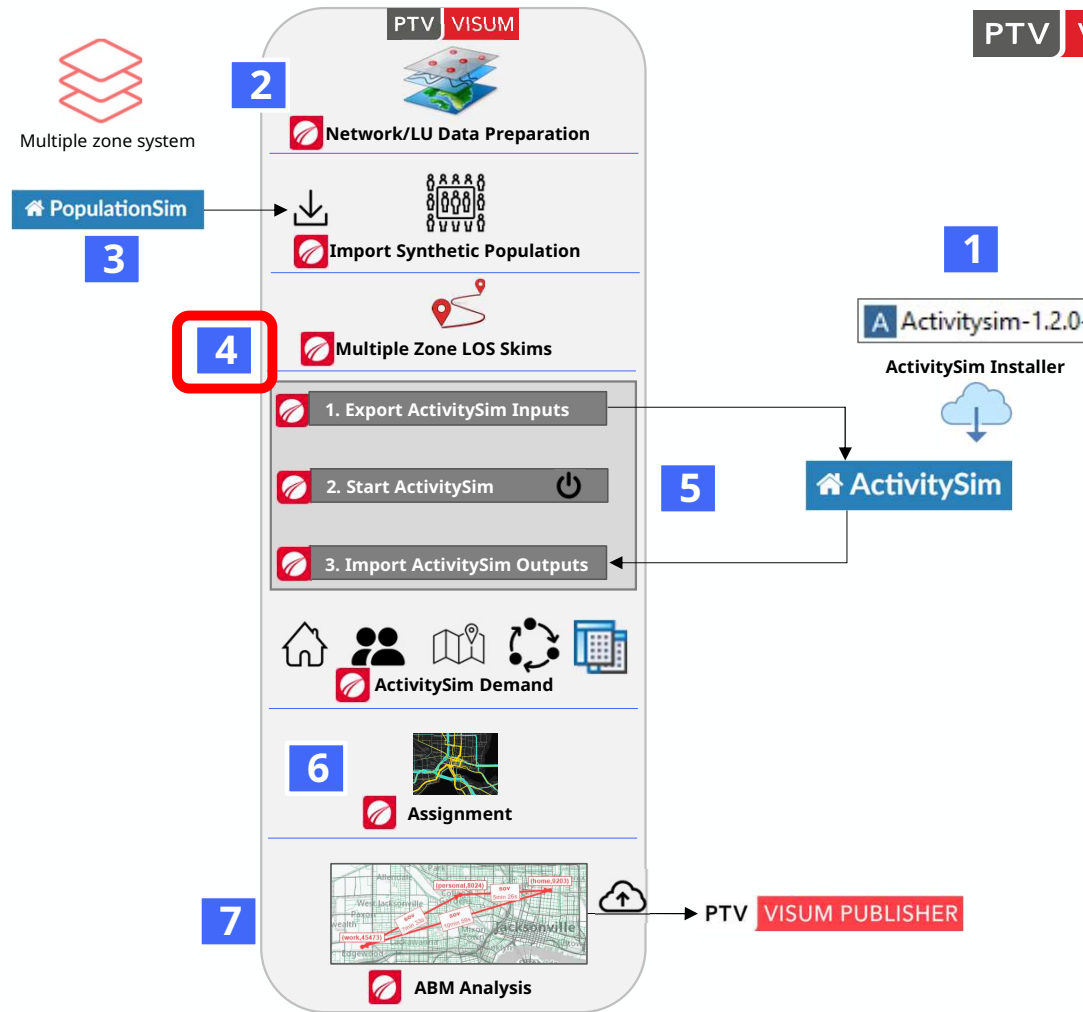
# Import Synthetic Population

## Customized PopulationSim Importer

- The finest spatial units are read in as locations or zones
- Location and zone numbers must match
- Persons and households are imported into **ABM Data Structures** in Visum
- Automate using Python API



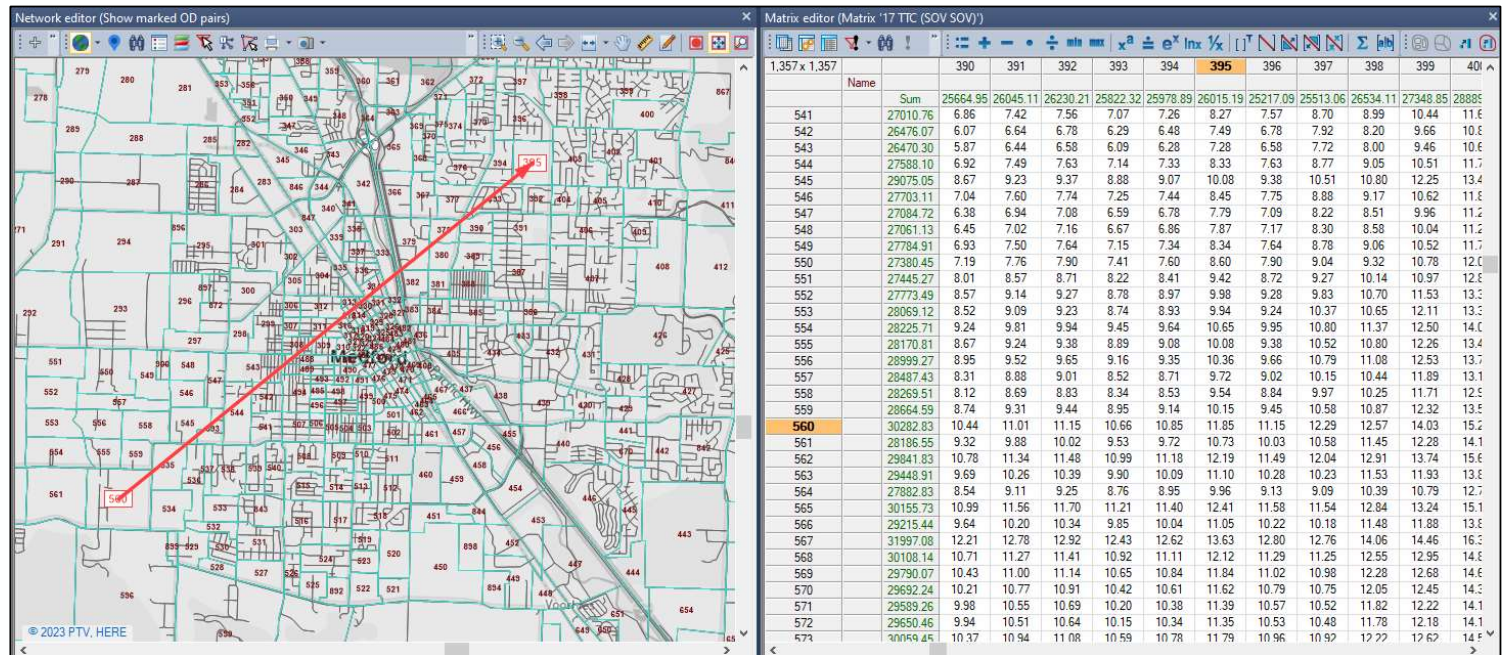
# Visum - ActivitySim Integration



# TAZ Skimming

## TAZ - TAZ Skimming

- TAZ skimming
  - Highway skims
  - Transit skims
  - Non-motorized skims

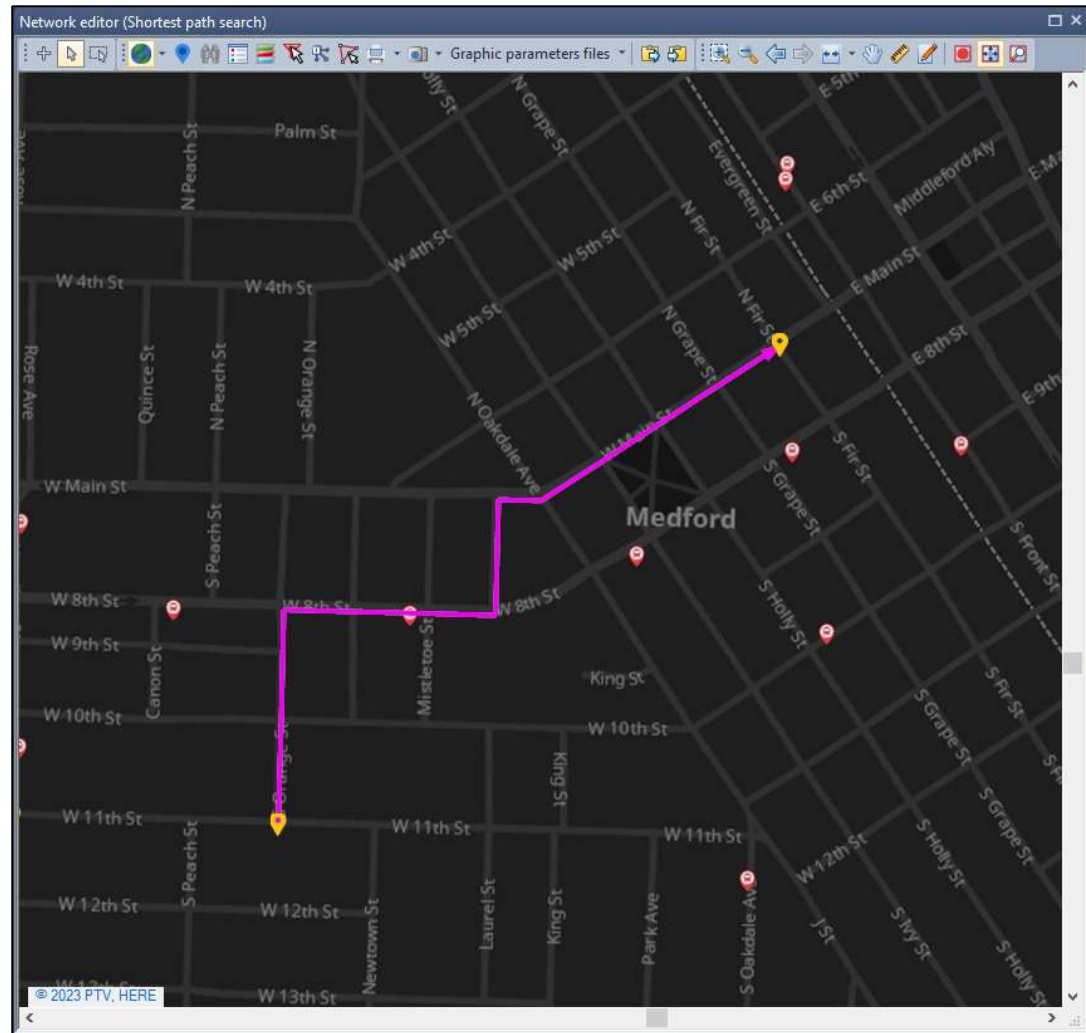


# MAZ Skimming

## Location-Location Skimming

### ■ MAZ (Location) Skims

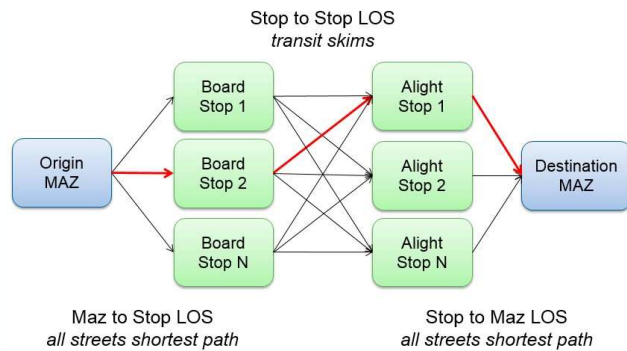
- Generated as part of ActivitySim inputs import
- MAZ-MAZ skims for non-motorized modes
- MAZ-TAP, TAP-MAZ skims for Transit virtual path building (TVPB)



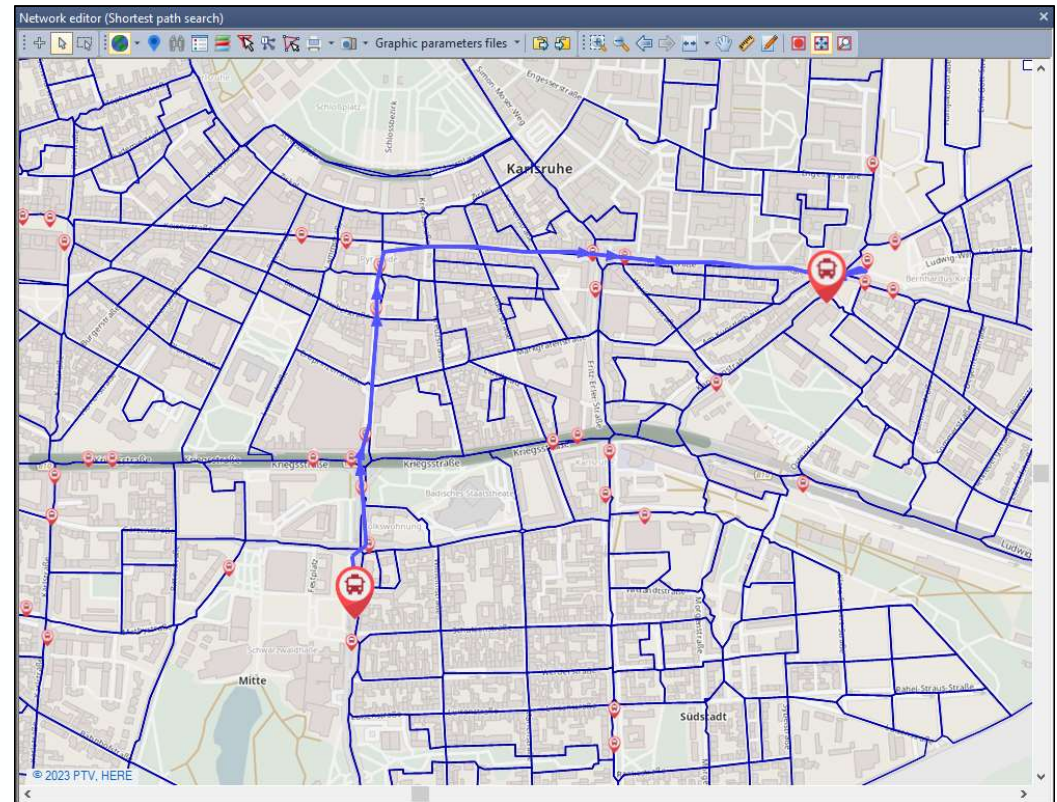
# TAP Skimming

## Stop Area – Stop Area Skimming

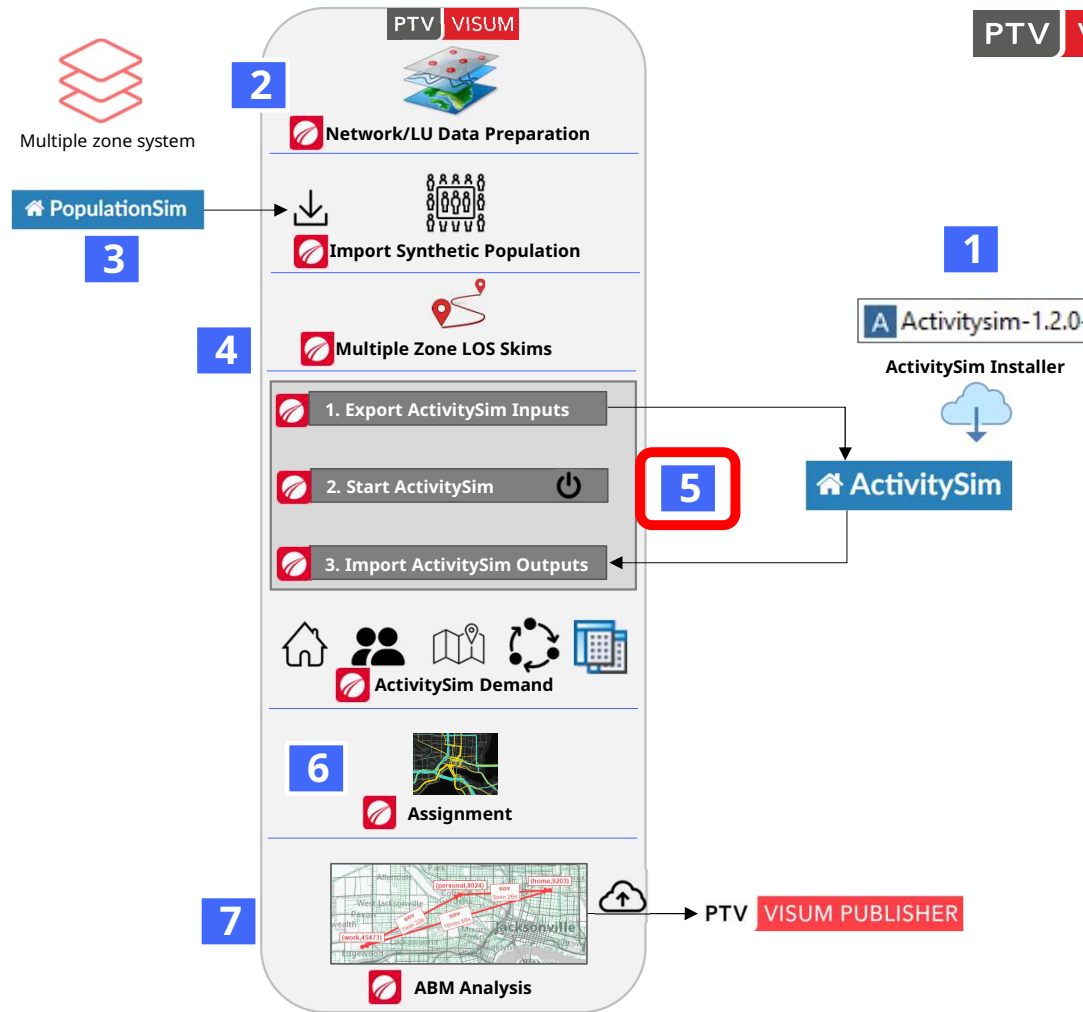
- TAP (Stop Area) Skims
  - Transit skims for 3-zone system ABMs
  - For transit virtual path building (TVPB)



Transit virtual path building



# Visum - ActivitySim Integration



# Setting up ActivitySim

<https://activitysim.github.io/activitysim/v1.2.0/>

### ActivitySim

The mission of the ActivitySim project is to create and maintain advanced, open-source, activity-based travel behavior modeling software based on best software development practices for distribution at no charge to the public.

The ActivitySim project is led by a consortium of Metropolitan Planning Organizations (MPOs) and other transportation planning agencies, which provides technical direction and resources to support project development. New member agencies are welcome to join the consortium. All member agencies help make decisions about development priorities and benefit from contributions of other agency partners. Additional information about the development and management of the ActivitySim is on the [project site](#).

**User's Guide**

Start here to learn about using ActivitySim, including how to install the software, and how to configure and run models.

**Developer's Guide**

Start here to learn about developing ActivitySim, including creating model components, or changing the codebase.

<https://activitysim.github.io/activitysim/v1.2.0/examples>

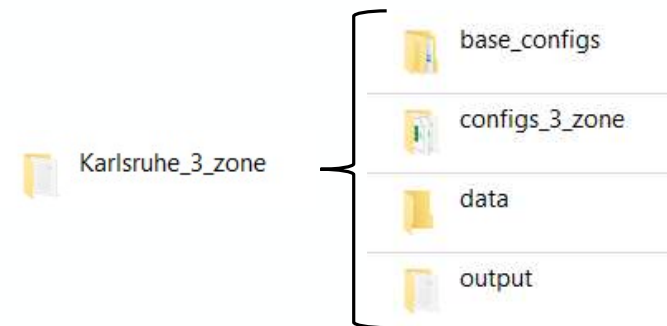
### Examples

The current examples are:

Example	Purpose	Zone Systems	Status
prototype_mtc	Original ActivitySim Example, derived from MTC TM1	1	Mature
prototype_mtc_extended	Prototype MTC example with additional optional models	1	In development
example_estimation	Estimation example with prototype_mtc	1	Mature
placeholder_multiple_zone	2 or 3 zone system example using MTC data	2 or 3	Simple test example
prototype_marin	3 zone system example using Marin tour mode choice model	3	Mature

## Configuring ActivitySim setup

- Start with an example
- Follow instructions in ActivitySim User's Guide to configure settings for your application
- Configure procedure steps in Visum to point to the configs and inputs



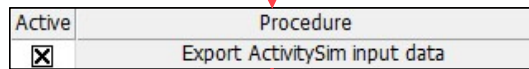
**A configured ActivitySim setup is a prerequisite for Visum-ActivitySim interfacing**

# ActivitySim Interface

List (Matrices)

Matrix filter: Matrix(NOC) > 0

Number: 894	No	Code	Name	MatrixType	Object TypeRef	Sum	DSegCode	DataSource Type	Formula	ASim	ASim_Name	Path
117	1111	DIS	SOV_DIST_MD	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_DIST_MD	
118	1110	DIS	SOV_DIST_EV	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_DIST_EV	
119	1109	DIS	SOV_DIST_EA	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_DIST_EA	
120	1108	DIS	SOV_DIST_AM	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_DIST_AM	
121	1107	UDS	SOV_BTOLL_PM	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_BTOLL_PM	
122	1106	UDS	SOV_BTOLL_MD	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_BTOLL_MD	
123	1105	UDS	SOV_BTOLL_EV	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_BTOLL_EV	
124	1104	UDS	SOV_BTOLL_EA	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_BTOLL_EA	
125	1103	UDS	SOV_BTOLL_AM	Skim	Zone	0.000	SOV	Data		<input checked="" type="checkbox"/>	SOV_BTOLL_AM	
126	3585	TWT	LRF_XWAIT_SHORT_PM	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_SHORT_PM	SHORT
127	3584	TWT	LRF_XWAIT_SHORT_MD	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_SHORT_MD	SHORT
128	3583	TWT	LRF_XWAIT_SHORT_EV	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_SHORT_EV	SHORT
129	3582	TWT	LRF_XWAIT_SHORT_EA	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_SHORT_EA	SHORT
130	3581	TWT	LRF_XWAIT_SHORT_AM	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_SHORT_AM	SHORT
131	3580	TWT	LRF_XWAIT_FAST_PM	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_FAST_PM	FAST
132	3579	TWT	LRF_XWAIT_FAST_MD	Skim	Stop area	0.000	PT	Data		<input checked="" type="checkbox"/>	LRF_XWAIT_FAST_MD	FAST



Export ActivitySim input data parameters

General | ABM objects | P/T skims | Skim matrices

All zone and stop area matrices corresponding to the respective matrix expression are exported.

Zone matrices

Matrix reference: Matrix([ASIM])

108 matrices selected.

File name: taz\_skims1.omx

Stop area matrices

Matrix reference: Matrix([ASIM])

675 matrices selected.

File name: tap\_skims1.omx

OMX files

Attribute for matrix name in OMX files: ASim\_Name

OK Cancel

- households
- land\_use
- maz
- maz\_to\_maz\_bike
- maz\_to\_maz\_walk
- maz\_to\_tap\_drive
- maz\_to\_tap\_walk
- persons
- tap
- tap\_lines
- taz
- tap\_skims1.omx
- taz\_skims1.omx

## 1. Export ActivitySim Inputs

- Mark skim matrices for ActivitySim export
- Procedure step "Export ActivitySim input data"
- Exports skims in OMX and CSV format
- Exports land use and synthetic population files



# ActivitySim Interface

## 2. Start ActivitySim

- Procedure step "Start ActivitySim"
- Point the procedure to the installed ActivitySim executable
- Benefits
  - Runs ActivitySim from the same software
  - Shows errors and stops the model run
  - Configurable

Active	Procedure
<input checked="" type="checkbox"/>	Start ActivitySim

Start ActivitySim

Location of ActivitySim installation

Name of the Conda environment:  
asim

Path to ActivitySim.exe:  
C:\ProgramData\activitysim\Scripts\activitysim.exe

Input and output directories

Working directory: ka\_3\_zone

Data directory: data\_3

Output directory: output\_3

Configuration directories	Folder path
1	configs_3_zone
2	source_example\configs

More options

Chunk size:

Additional command line parameters:

OK Cancel

```
ActivitySim
Configured logging using basicConfig
INFO:activitysim:Configured logging using basicConfig
INFO - Read logging configuration from: configs_3_zone\logging.yaml
INFO - SETTING configs_dir: ['configs_3_zone', 'example_mtc\configs']
INFO - SETTING settings_file_name: settings.yaml
INFO - SETTING data_dir: ['data_3']
INFO - SETTING output_dir: output_3
INFO - SETTING households_sample_size: 0
INFO - SETTING chunk_size: 0
INFO - SETTING chunk_method: hybrid_uss
INFO - SETTING chunk_training_mode: disabled
INFO - SETTING multiprocessing: None
INFO - SETTING num_processes: None
INFO - SETTING resume_after: None
INFO - SETTING trace_log_id: None
INFO - ENV MKL_NUM_THREADS: None
INFO - ENV OMP_NUM_THREADS: None
INFO - ENV OPENBLAS_NUM_THREADS: None
INFO - NUMPY blas_info libraries: ['cblas', 'blas', 'cblas', 'blas', 'cblas', 'blas']
INFO - NUMPY blas_opt_info libraries: ['cblas', 'blas', 'cblas', 'blas', 'cblas', 'blas']
INFO - NUMPY lapack_info libraries: ['lapack', 'blas', 'lapack', 'blas']
INFO - NUMPY lapack_opt_info libraries: ['lapack', 'blas', 'lapack', 'blas', 'cblas', 'blas', 'cblas', 'blas', 'cblas', 'blas']
INFO - run single process simulation
INFO - Time to execute open_pipeline : 0.009 seconds (0.0 minutes)
INFO - preload_injectables
INFO - Time to execute preload_injectables : 0.012 seconds (0.0 minutes)
INFO - #run_model running step initialize_landuse
Running step 'initialize_landuse'
INFO - Reading CSV file data_3\land_use.csv
```

Start ActivitySim

ActivitySim is running.

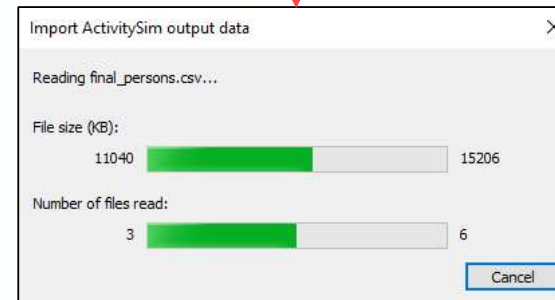
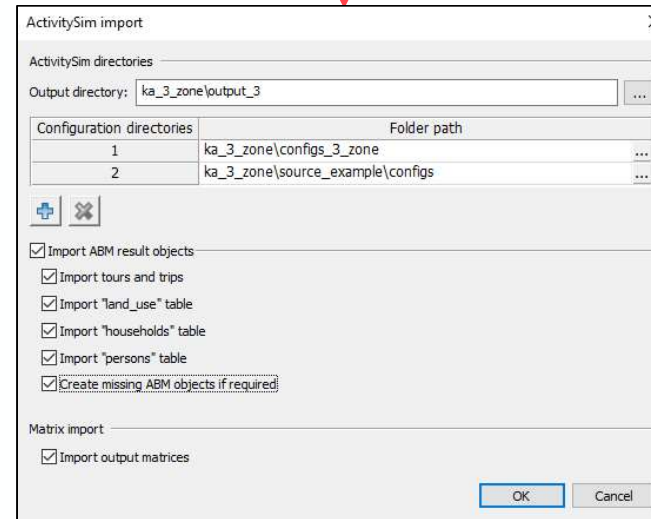
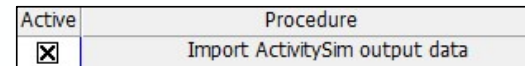
To cancel the procedure, either close the ActivitySim window or click 'Cancel'.

Cancel

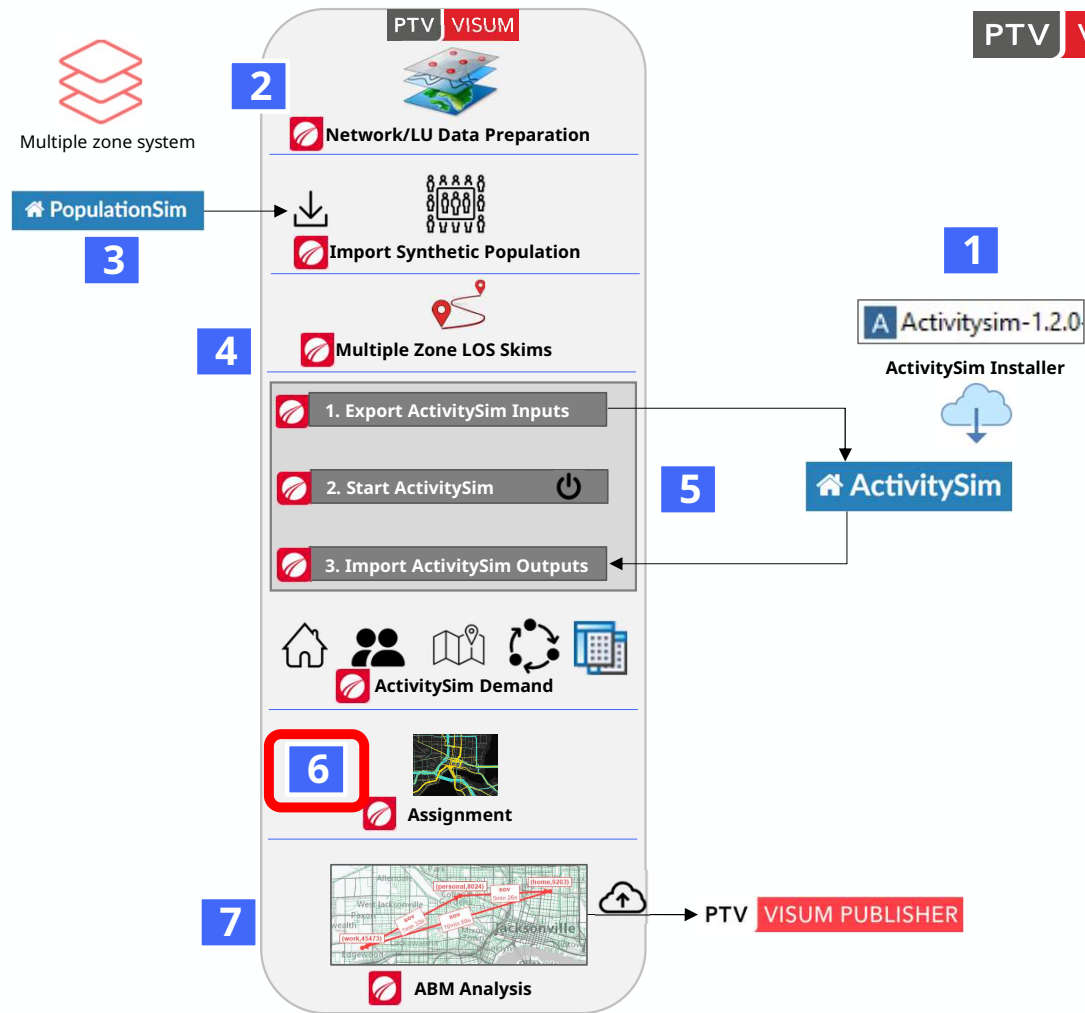
# ActivitySim Interface

## 3. Import ActivitySim Outputs

- Procedure step “Import ActivitySim output data”
- Specify the output and configs folder of the ActivitySim setup
- Mark ABM outputs and matrices to be imported
- ActivitySim outputs are loaded into the following ABM Objects
  - Household, Person, Tour, Trip, Activity Execution, Schedule
- Imported matrices can be processed for assignment



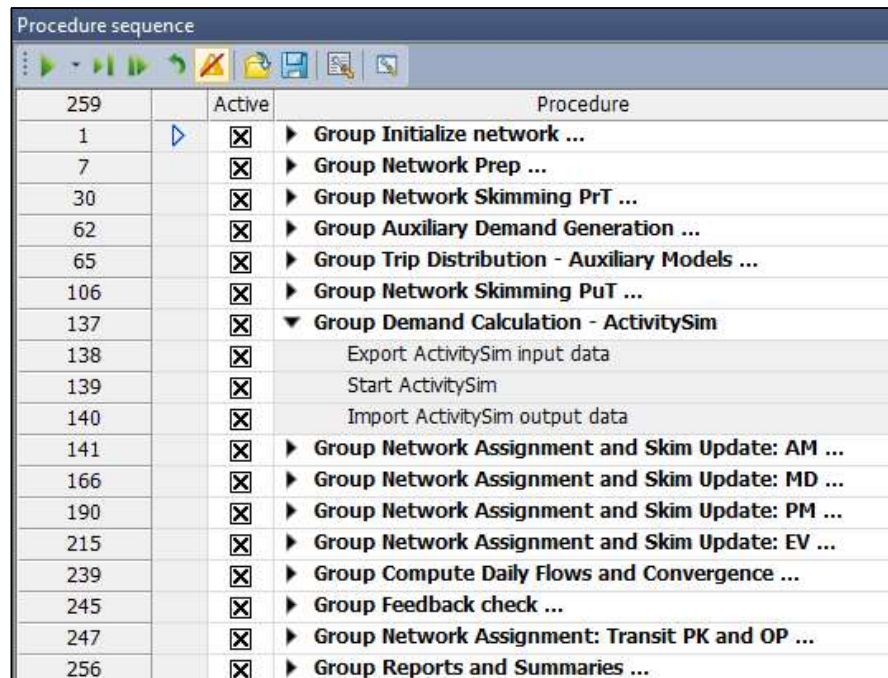
# Visum - ActivitySim Integration



# Assignment & Feedback

- Use state-of-the-art assignment algorithm for highway, transit, and non-motorized demand
- Assignment procedure assigns path probabilities to individual trips
- Implement feedback loop and MSA averaging
- Add auxiliary model components
- Generate reports and summaries using Visum's Python API

## Procedure Sequence with ActivitySim

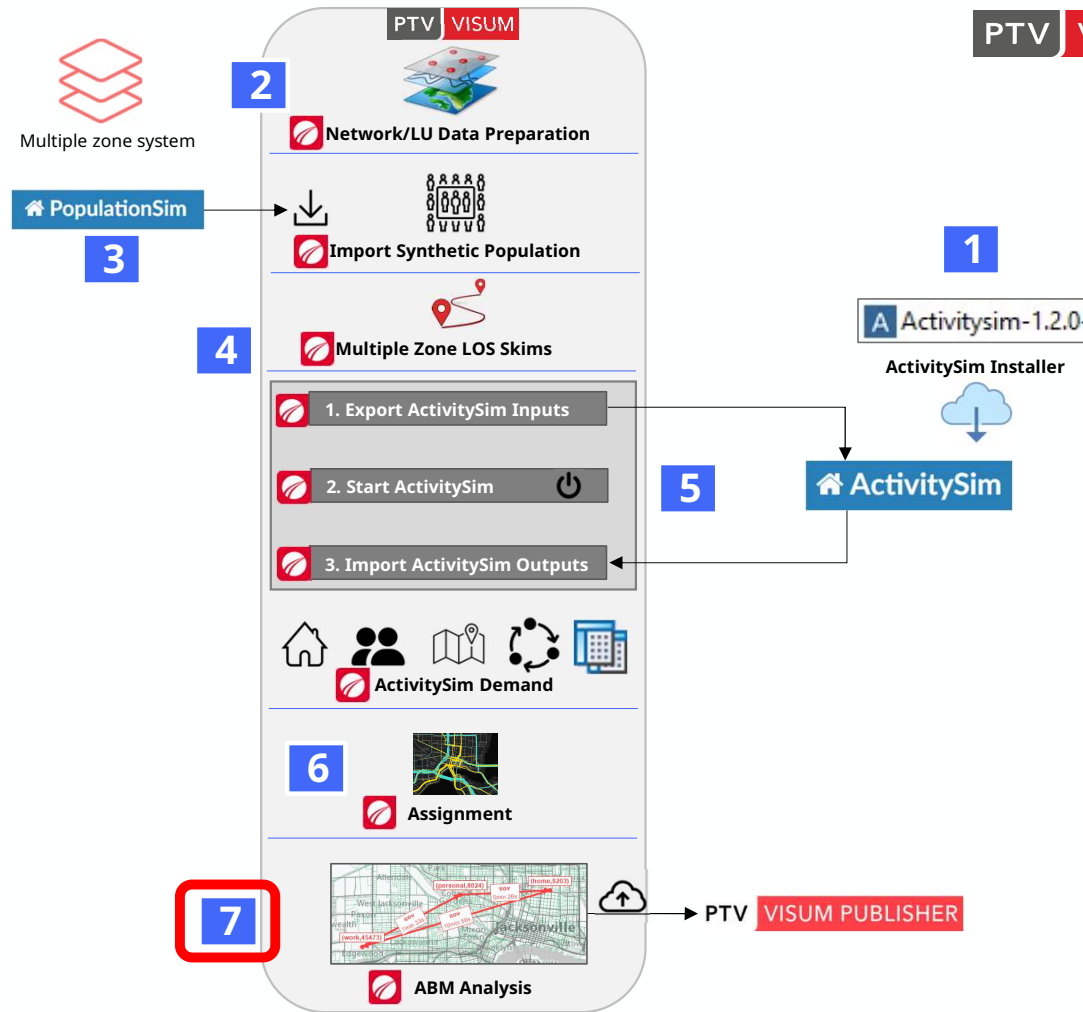


Procedure sequence		
	Active	Procedure
259		
1	<input checked="" type="checkbox"/>	▶ Group Initialize network ...
7	<input checked="" type="checkbox"/>	▶ Group Network Prep ...
30	<input checked="" type="checkbox"/>	▶ Group Network Skimming PrT ...
62	<input checked="" type="checkbox"/>	▶ Group Auxiliary Demand Generation ...
65	<input checked="" type="checkbox"/>	▶ Group Trip Distribution - Auxiliary Models ...
106	<input checked="" type="checkbox"/>	▶ Group Network Skimming PuT ...
137	<input checked="" type="checkbox"/>	▼ Group Demand Calculation - ActivitySim
138	<input checked="" type="checkbox"/>	Export ActivitySim input data
139	<input checked="" type="checkbox"/>	Start ActivitySim
140	<input checked="" type="checkbox"/>	Import ActivitySim output data
141	<input checked="" type="checkbox"/>	▶ Group Network Assignment and Skim Update: AM ...
166	<input checked="" type="checkbox"/>	▶ Group Network Assignment and Skim Update: MD ...
190	<input checked="" type="checkbox"/>	▶ Group Network Assignment and Skim Update: PM ...
215	<input checked="" type="checkbox"/>	▶ Group Network Assignment and Skim Update: EV ...
239	<input checked="" type="checkbox"/>	▶ Group Compute Daily Flows and Convergence ...
245	<input checked="" type="checkbox"/>	▶ Group Feedback check ...
247	<input checked="" type="checkbox"/>	▶ Group Network Assignment: Transit PK and OP ...
256	<input checked="" type="checkbox"/>	▶ Group Reports and Summaries ...

04

ABM Output Analysis

# Visum - ActivitySim Integration



# ABM Output Analysis

## Example Daily Schedule – Person 33 (SOABM)

Control of network element view and filter modes

Location: All  Location as household  Location as long-term choice

Number	298,545	No	HouseholdNo	Index	Long TermChoiceKeys	XCoord	YCoord	AGEP	EMPLOYED	ESR	GQFLAG	GQTYPE	HHID	MAJORUNI	MAZ	MIL	OCCP	PUMA	SCHG	SCHL	SERIALNO	SEX	
31		31	14	1		678053.3030314110	277129.3792879028	50	1	1	0	0	0	14	0	10101	5	4	900	-8	9	2011001187206	2
32		32	14	2		678053.3030314110	277129.3792879028	50	1	1	0	0	0	14	0	10101	5	4	900	-8	9	2011001187206	1
33		33	15	1		678053.3030314110	277129.3792879028	53	1	1	0	0	0	15	0	10101	5	2	900	-8	12	2010000859710	2
34		34	15	2		678053.3030314110	277129.3792879028	55	1	1	0	0	0	15	0	10101	5	6	900	-8	13	2010000859710	1
35		35	16	1		678053.3030314110	277129.3792879028	53	1	1	0	0	0	16	0	10101	5	5	900	-8	9	2009001084106	1
36		36	16	2		678053.3030314110	277129.3792879028	44	1	1	0	0	0	16	0	10101	5	2	900	-8	10	2009001084106	2
37		37	17	1		678053.3030314110	277129.3792879028	72	0	6	0	0	0	17	0	10101	5	999	900	-8	14	2009000617123	1

Person: All

Number	1	Person	ScheduleNo	No	MainDSegCode	IsValid
1		33	1	1		✗

Person: All

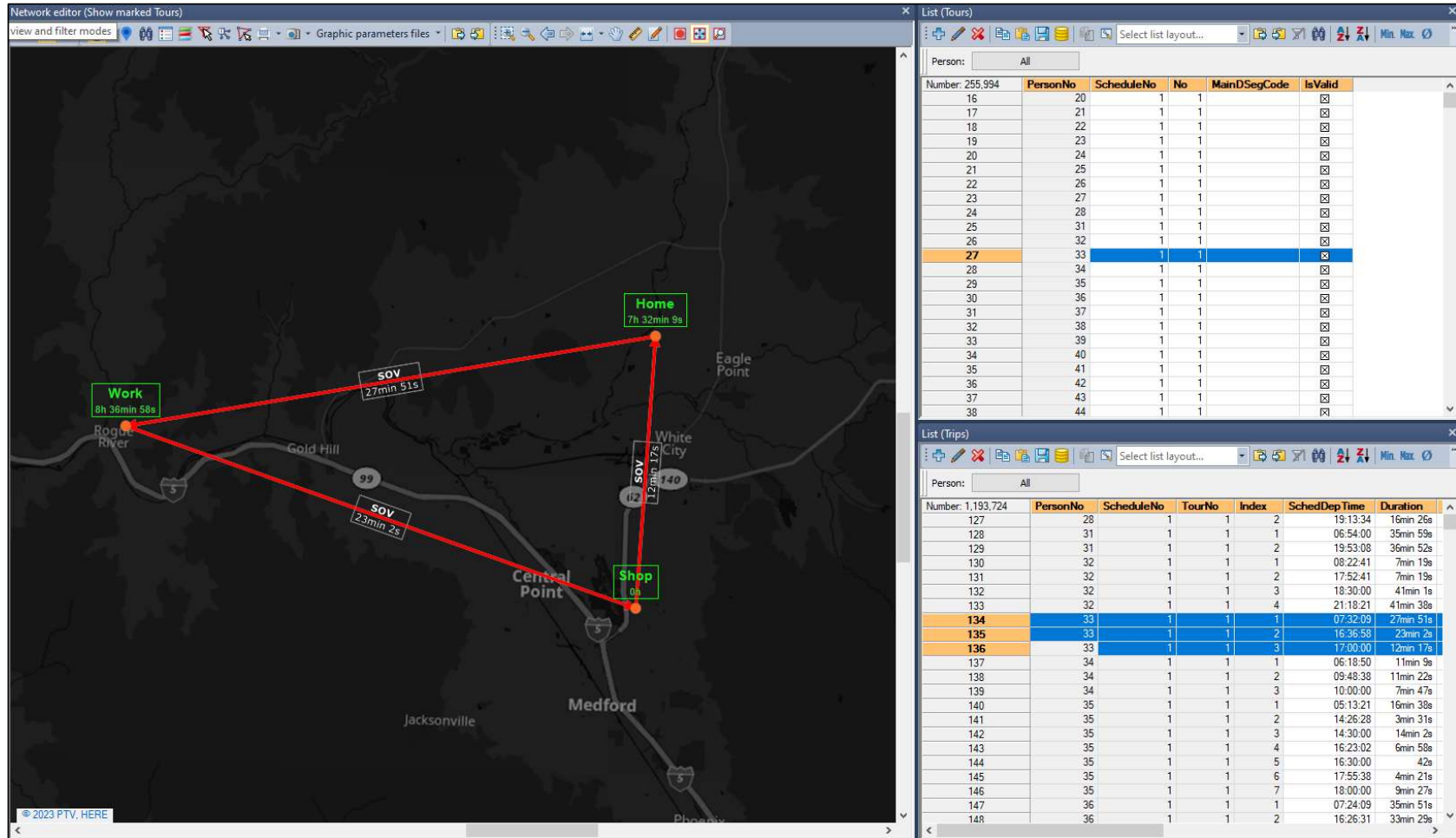
Number	1,193,724	PersonNo	ScheduleNo	TourNo	Index	SchedDep Time	Duration	SchedArr Time	DSegCode	FromActivityExecution	ToActivityExecution
133		32	1	1	4	21:18:21	41min 38s	21:59:59	SOV		5
134		33	1	1	1	07:32:09	27min 51s	08:00:00	SOV	1	2
135		33	1	2	2	16:36:58	23min 2s	17:00:00	SOV	2	3
136		33	1	3	3	17:00:00	12min 17s	17:12:17	SOV	3	4
137		34	1	1	1	06:18:50	11min 9s	06:29:59	SOV	1	2
138		34	1	2	2	09:49:38	11min 22s	10:00:00	SOV	2	3
139		34	1	3	3	10:00:00	7min 47s	10:07:47	SOV	3	4
140		35	1	1	1	05:13:21	16min 38s	05:29:59	SOV	1	2

Person: All

Number	1,449,718	PersonNo	ScheduleNo	Index	Start Time	Duration	End Time	ActivityCode	LocationNo	ActivityLocationKey
158		32	1	4	18:30:00	2h 48min 21s	21:18:21	Maintenance	217103	(Maintenance,217103)
159		32	1	5	22:00:00	5h	27:00:00	Home	10101	(Home,10101)
160		33	1	1	00:00:00	7h 32min 9s	07:32:09	Home	10101	(Home,10101)
161		33	1	2	08:00:00	8h 36min 58s	16:36:58	Work	221001	(Work,221001)
162		33	1	3	17:00:00	0h	17:00:00	Shop	83901	(Shop,83901)
163		33	1	4	17:00:00	10h	27:00:00	Home	10101	(Home,10101)
164		34	1	1	00:00:00	6h 18min 50s	06:18:50	Home	10101	(Home,10101)
165		34	1	2	06:30:00	3h 18min 38s	09:48:38	Work	16801	(Work,16801)
166		34	1	3	10:00:00	0h	10:00:00	Escort	12401	(Escort,12401)
167		34	1	4	10:00:00	17h	27:00:00	Home	10101	(Home,10101)

# ABM Output Analysis

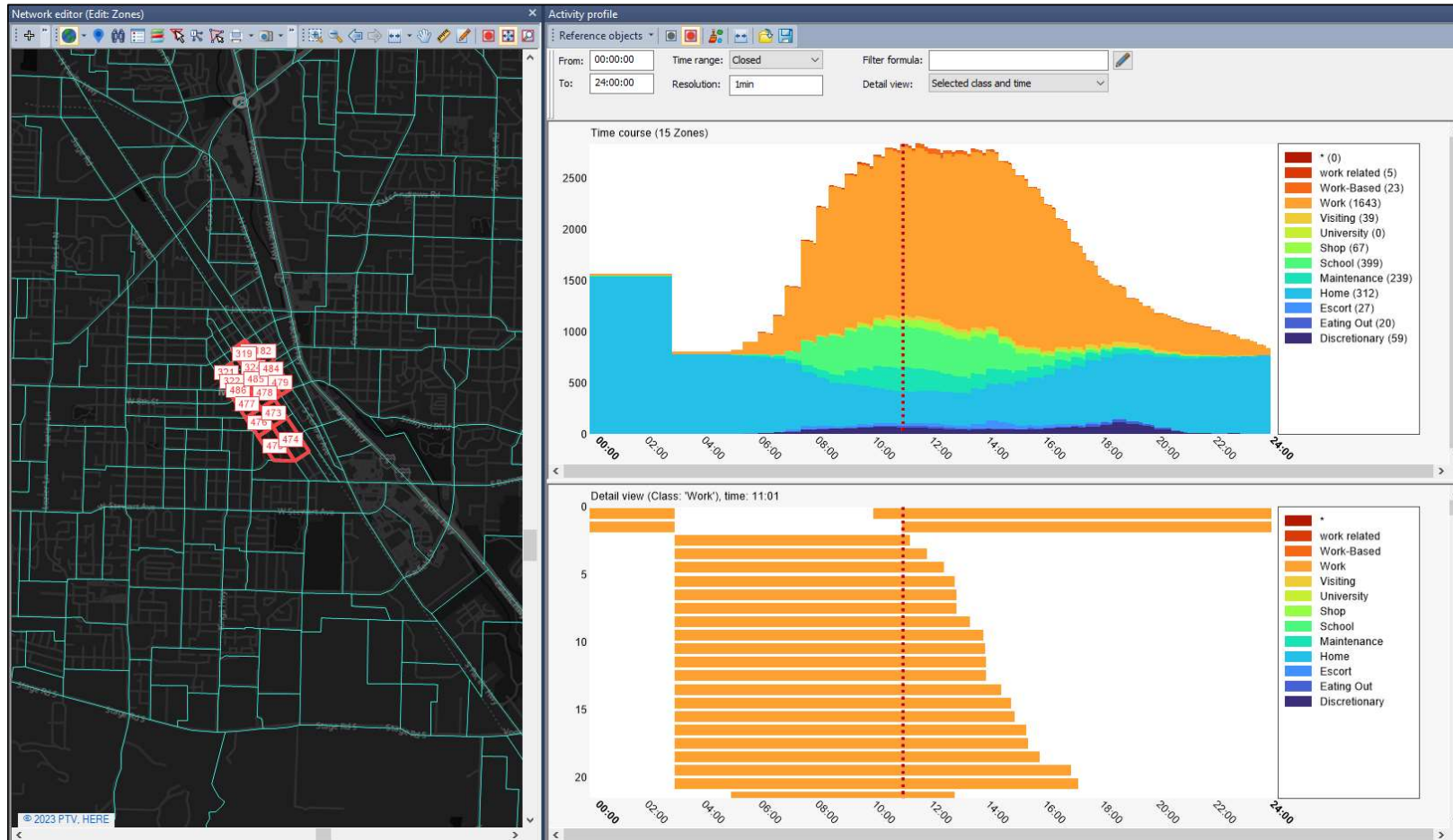
## Tour/Trip Tracing (Person 33)





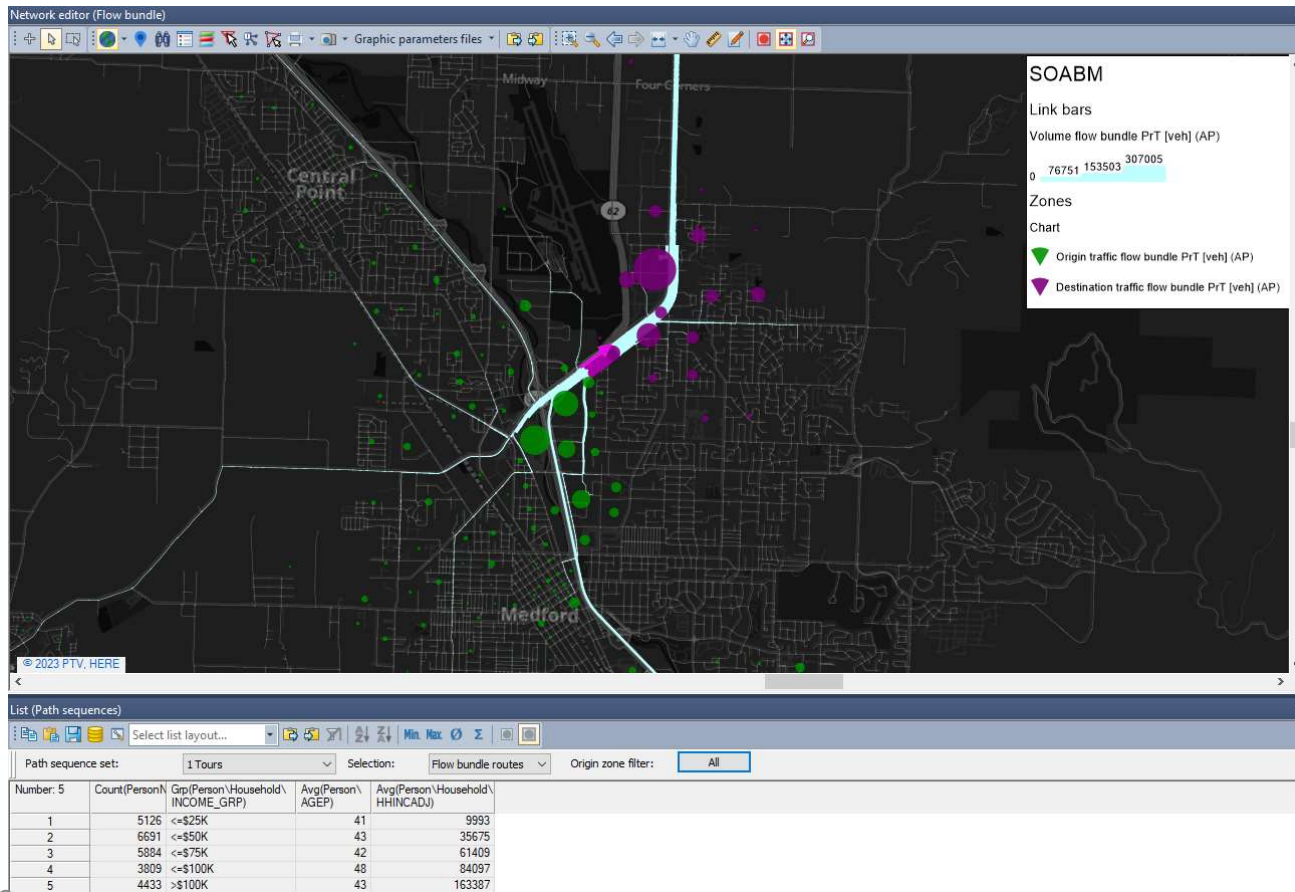
# ABM Output Analysis

## Activity Profile in Downtown Medford

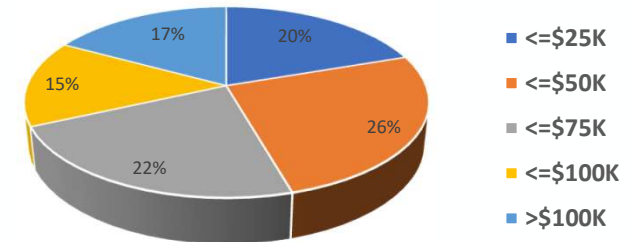


# ABM Select Link Analysis

What is the income of users of the select link and where do they live?

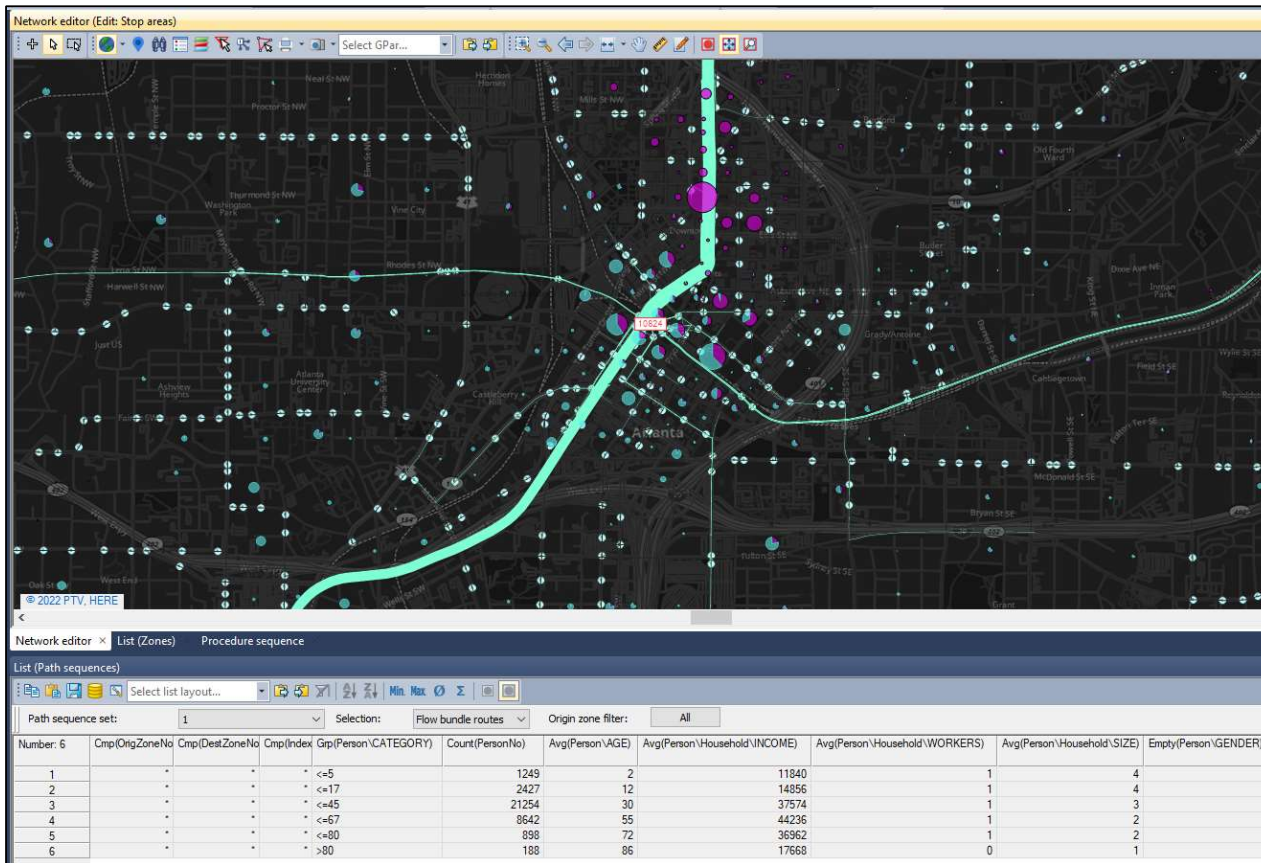


Link Traveler Income Distribution

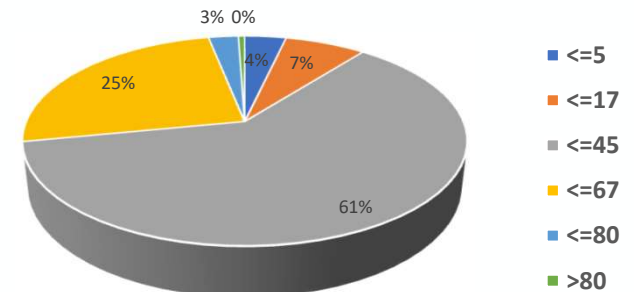


# ABM Select Stop Analysis

What is the age distribution of transit riders at the selected stop?

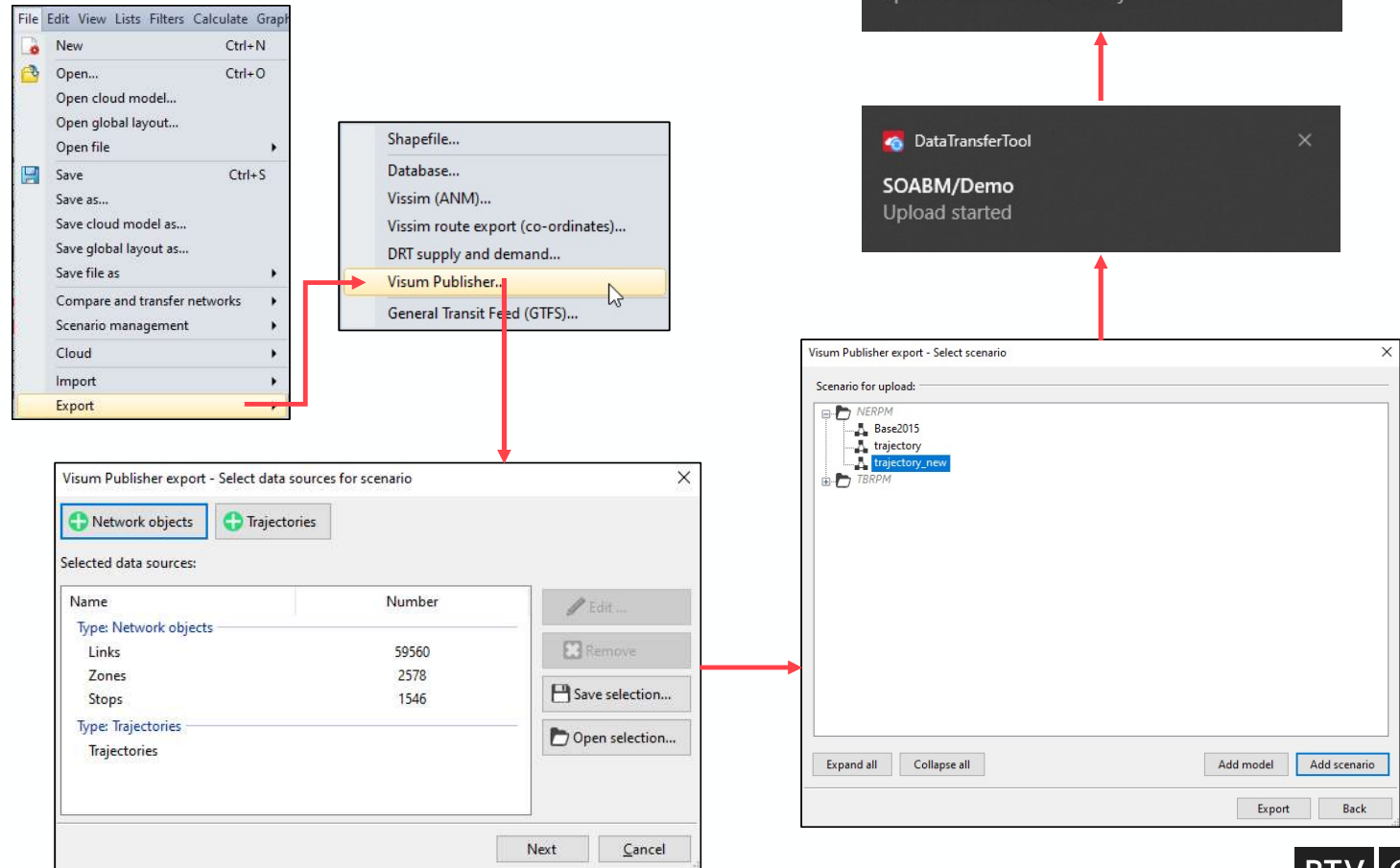


Transit Stop User Age Profile



# ABM Output Analysis

- Export model outputs to PTV Cloud directly from Visum
- Create custom dashboards on MyPTV



# ABM Output Analysis

## Create custom dashboards and animations using the uploaded data

PTV VISUM PUBLISHER

The image displays three overlapping screenshots of the PTV Visum Publisher web application. The largest screenshot shows a 'Dashboard 8' configuration page with a sidebar for adding widgets. The sidebar categories include 'From Your Data' (with 'Zones' widgets), 'Charts' (with 'Column Chart' and 'Line Chart'), 'Map' (with 'Animated' and 'Static' options), and 'Other'. The main area contains an 'Add a widget' instruction and a ghost icon.

The middle screenshot shows the 'Dashboards' overview page with a table of existing dashboards:

Name	Create
NERPM Trajectories	1/25/2022
NERPM-AB VMT per capita	8/25/2022
NERPM-AB: Commute time	8/25/2022
NERPM-AB: Non-work travel time	8/25/2022
SOABM Trajectories	2/1/2023

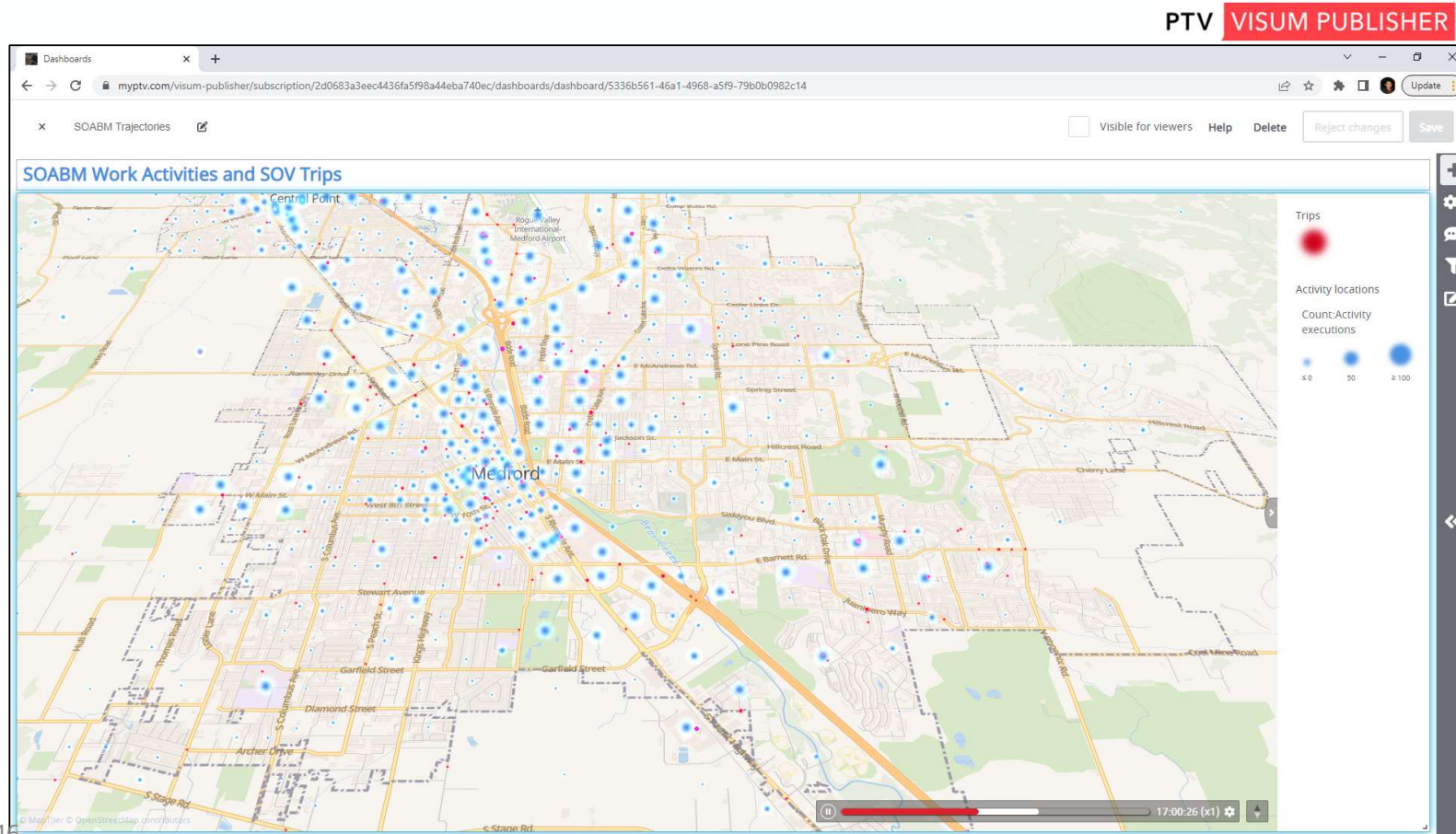
The bottom-left screenshot shows a sidebar with 'Add Model' and a list of models:

- NERPM
- SOABM

At the bottom left, there is a small '45' icon and 'TBRPM' text. At the bottom right, there is a date '11/21/2022' and 'Add Scenario Delete' buttons.

# ABM Output Analysis

# Share ABM Results Online with PTV Visum Publisher



- Share ABM results online with PTV Visum Publisher
- New cloud-based solution for collaboration

# Benefits of

PTV

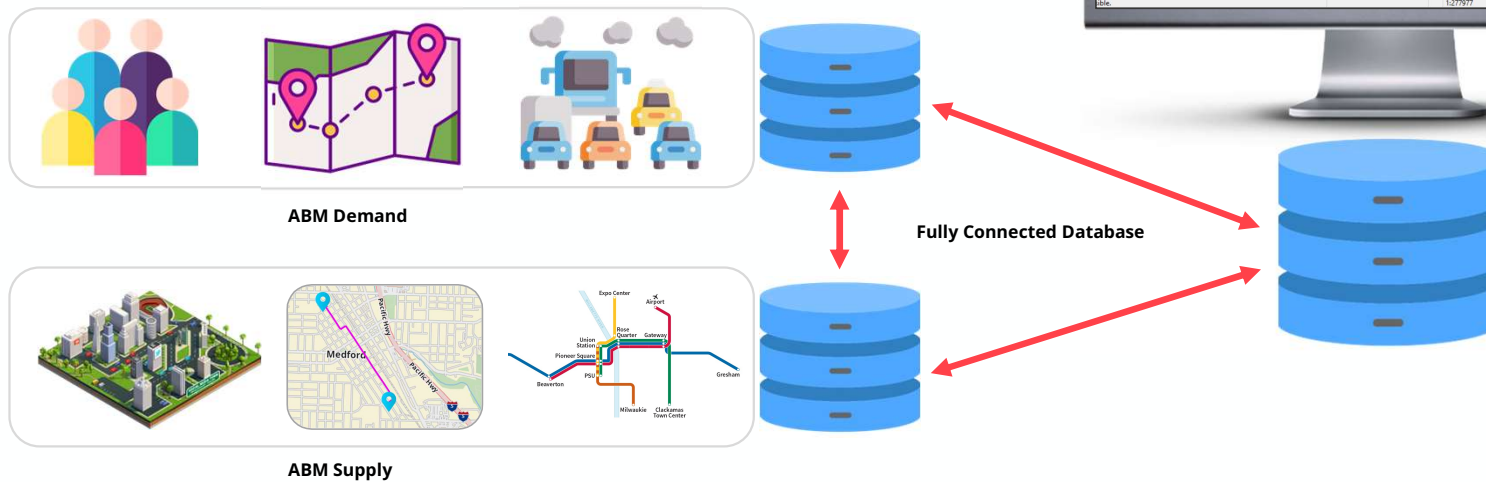
VISUM

ActivitySim

# Integration

## 1 True data management

Manage ABM demand and supply data at the same time in one integrated data model



# Benefits of



# Integration

**Filters**

Number	No.	COUNTY	TAZ	POP	ENROLL3_12	EMP_TOTAL	DI
1	10001	JacksonCounty	100	22.00	0.00	1.00	
2	10101	JacksonCounty	101	23.00	0.00	3.00	
3	10201	JacksonCounty	102	100.00	0.00	3.00	
4	10302	JacksonCounty	102	85.00	0.00	0.00	
5	10301	JacksonCounty	103	106.00	0.00	4.00	
6	10401	JacksonCounty	104	77.00	0.00	5.00	
7	10501	JacksonCounty	105	45.00	0.00	285.00	
8	10601	JacksonCounty	106	19.00	0.00	10.00	

**Scenario Management**

**Graphics Parameters**

**Lists**

Number	2570	No.	COUNTY	TAZ	POP	ENROLL3_12	EMP_TOTAL
1	10001	JacksonCounty	100	22.00	0.00	1.00	
2	10101	JacksonCounty	101	23.00	0.00	3.00	
3	10201	JacksonCounty	102	100.00	0.00	3.00	
4	10302	JacksonCounty	102	85.00	0.00	0.00	
5	10301	JacksonCounty	103	106.00	0.00	4.00	
6	10401	JacksonCounty	104	77.00	0.00	5.00	
7	10501	JacksonCounty	105	45.00	0.00	285.00	
8	10601	JacksonCounty	106	19.00	0.00	10.00	
9	10701	JacksonCounty	107	21.00	0.00	0.00	
10	10801	JacksonCounty	108	10.00	0.00	3.00	
11	10901	JacksonCounty	109	15.00	0.00	11.00	
12	10902	JacksonCounty	109	37.00	0.00	5.00	
13	11001	JacksonCounty	110	212.00	0.00	0.00	
14	11002	JacksonCounty	110	12.00	0.00	4.00	
15	11101	JacksonCounty	111	6.00	0.00	16.00	
16	11102	JacksonCounty	111	6.00	0.00	7.00	



**Advanced Analysis**



## 2 Ease-of-use

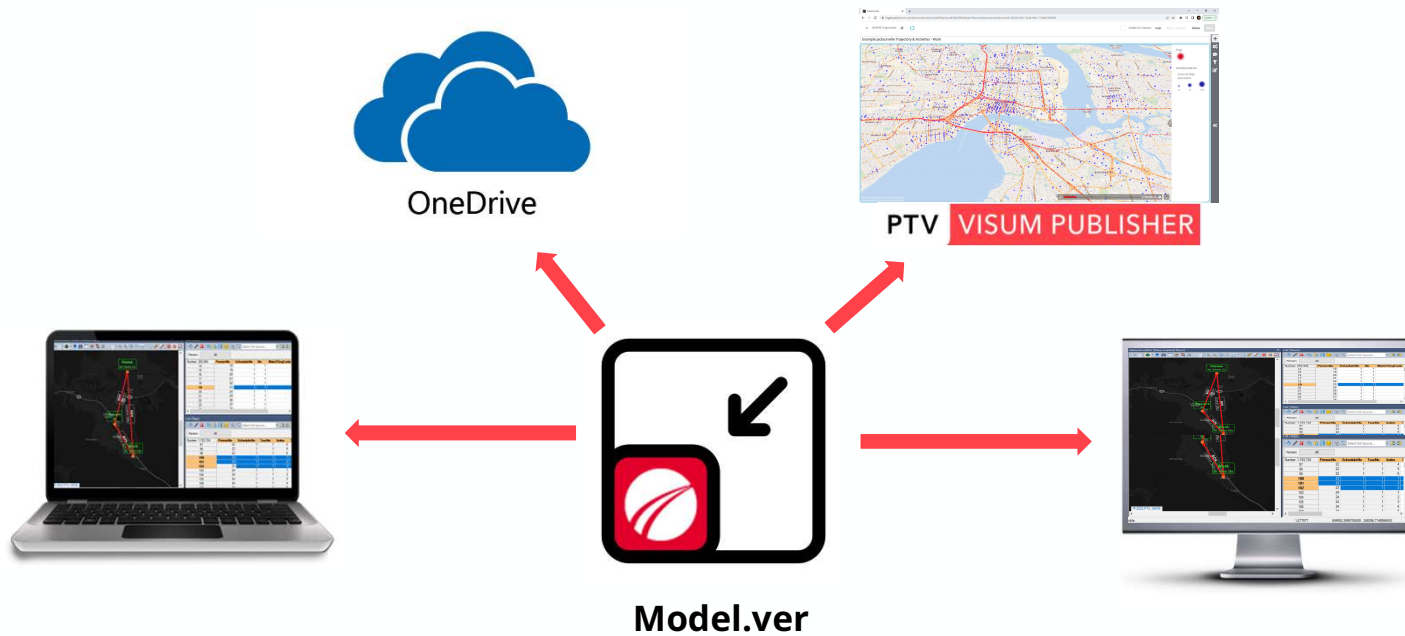
Use PTV Visum's powerful and familiar tools – lists, filters, graphic parameters, scenarios, etc. – for model application and analysis



# Benefits of



# Integration



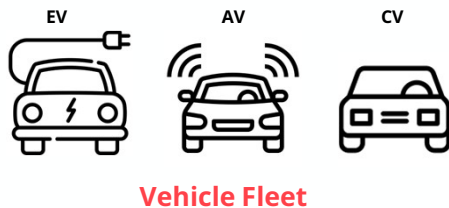
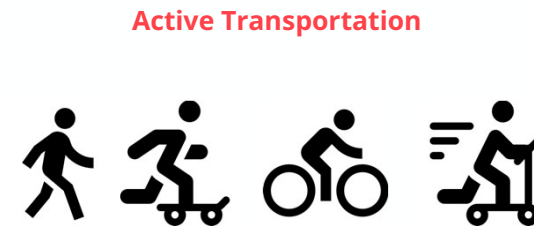
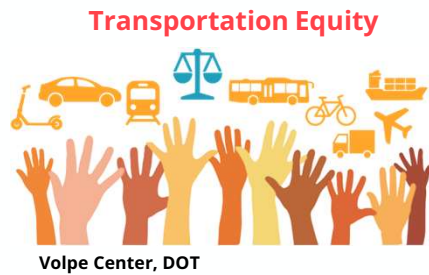
## 3 Portability

Store a complete model scenario – both demand and supply – in one compact file for collaborating with others

# Benefits of – Integration

## 4 Enable advanced analysis

Harness the power of ABMs for answering today's pressing planning questions



Benefits of

PTV

VISUM

ActivitySim

Integration

## 5 Improved runtime and performance

Get quick and accurate results with Visum's high-performance algorithms



**Faster model runs**



**State-of-the-art algorithms**



**Accurate, stable, and consistent results**



**Novel features with every release**



# QUESTIONS



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PTV Americas

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