AGENT

Advanced travel demand modeling with Agent

Not for re-distribution

Bentley
Advancing Infrastructure

Disclaimer Statement

Release plans and timelines are forward-looking estimates and projections only. There can be no assurance that Bentley will be able to meet such estimates or projections by the dates specified, or at all. Do not make purchase decisions based on forward looking roadmaps.

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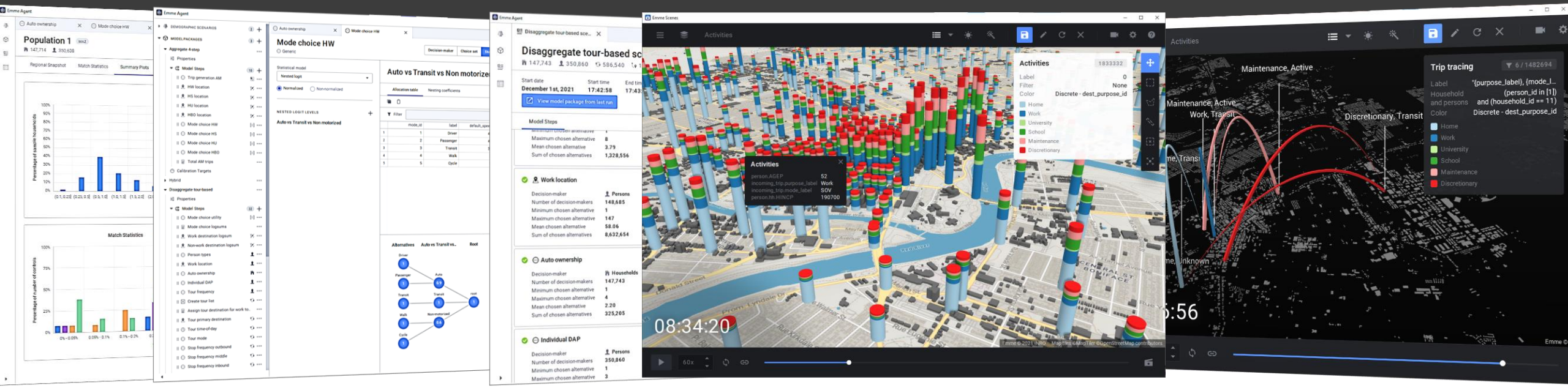
Agent is a flexible platform to assemble, calibrate and apply activity-based (ABM) and advanced travel demand models including 4-step for improved forecasting



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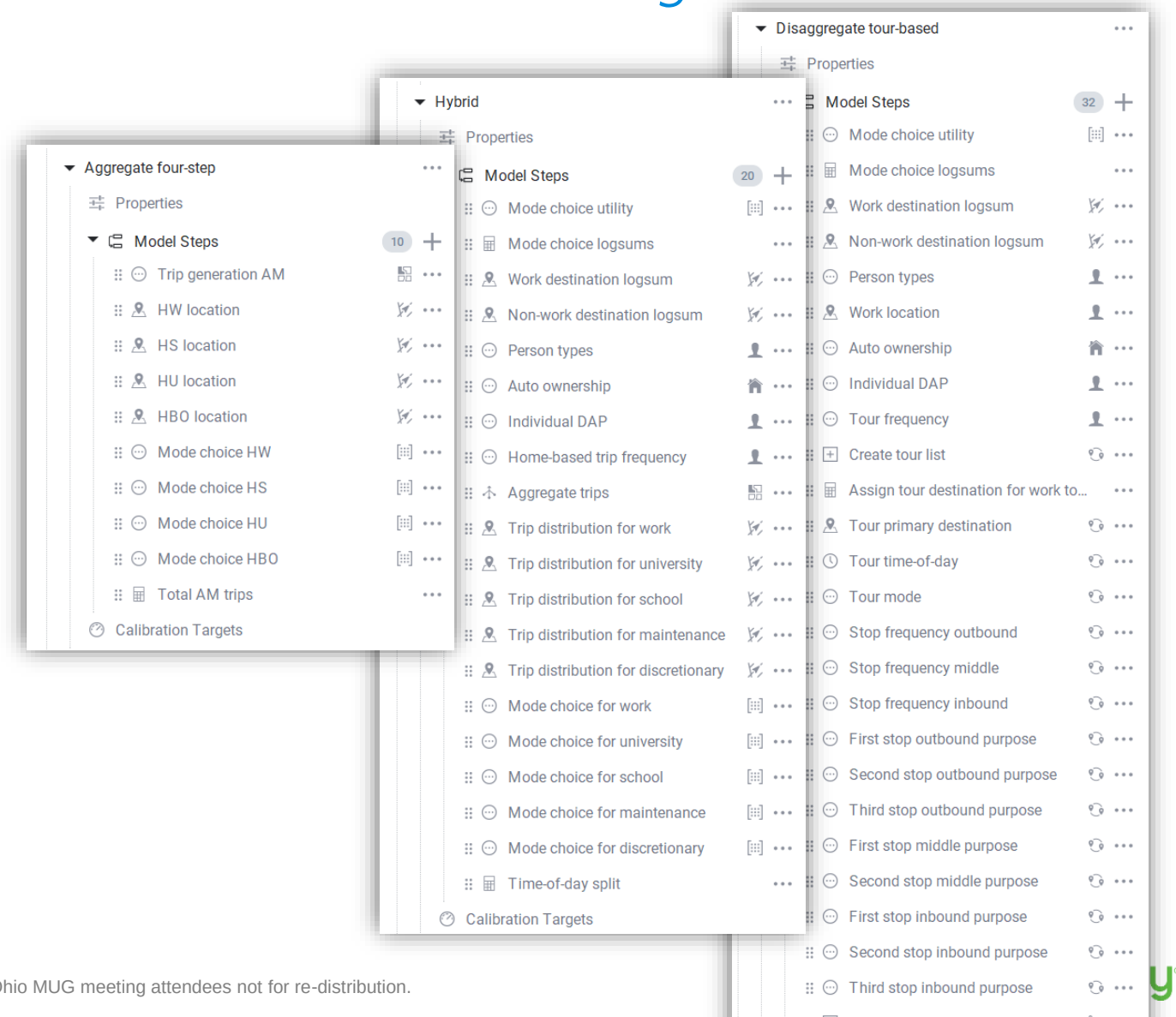
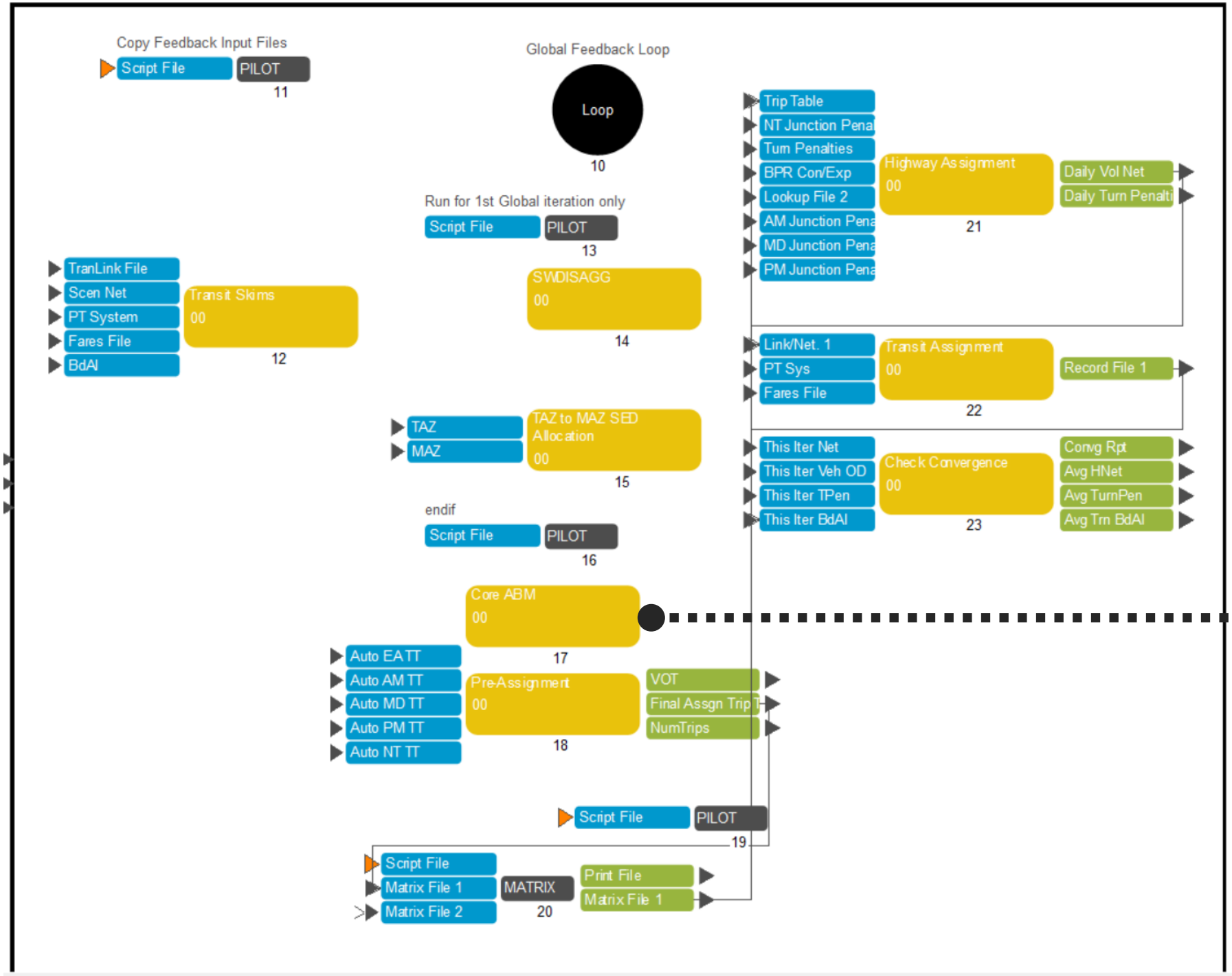
An advanced platform for travel demand modeling

- Assemble virtually any travel demand model structure from 4-step to ABM
- Maintain different model structures or versions in parallel
- Leverage automated calibration procedures to combine disparate data sources for improved model results
- Upgrade and advance models over time with new features
- Enjoy ease-of-use and transparent access to a full travel demand model UI





AGENT replaces existing ABM/Demand model box in your current CUBE application

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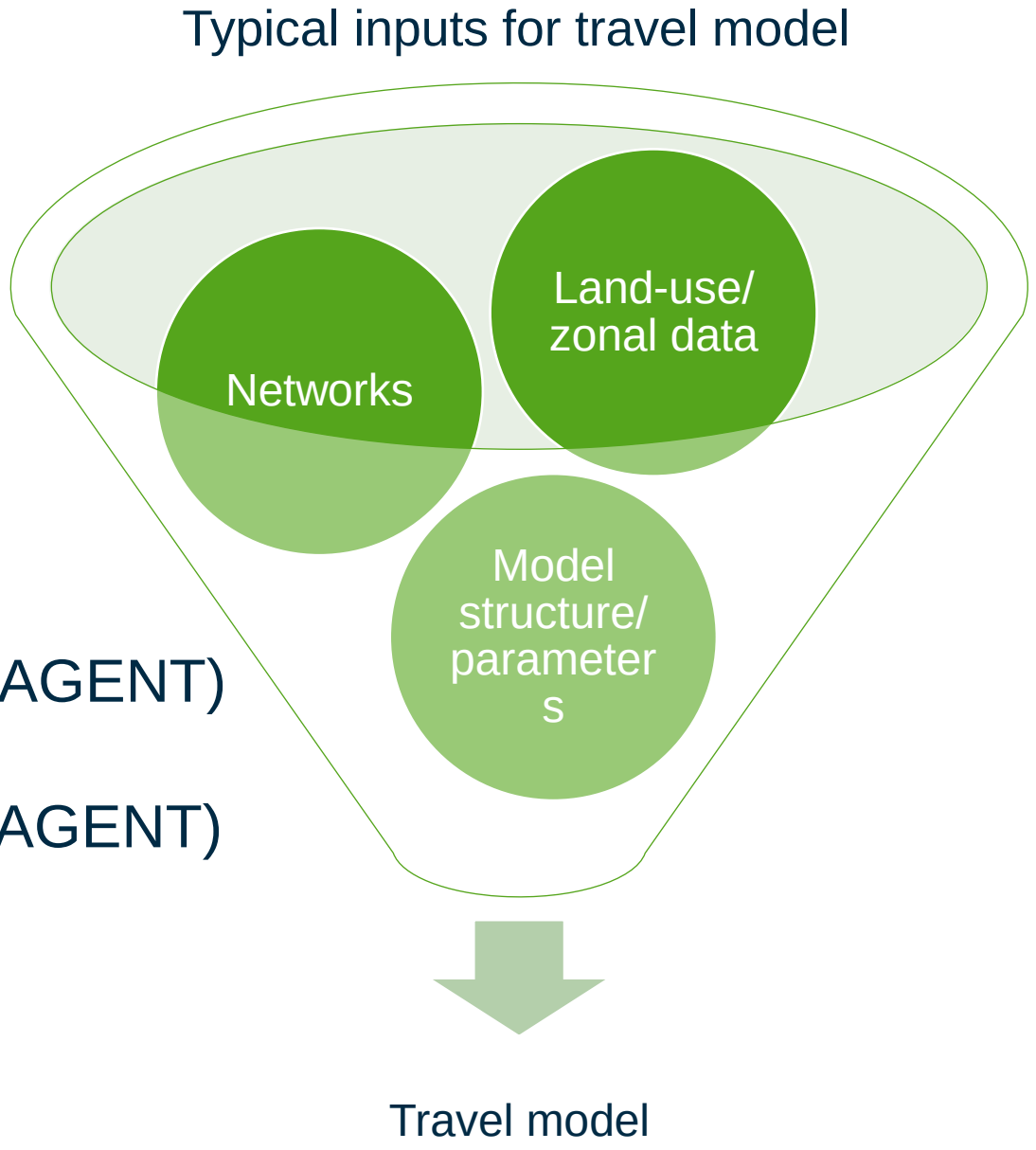
Network inputs → CUBE network

Land-use/zonal data → Demographic scenario (AGENT)

Model structure/parameters → Model package (AGENT)



Demographic scenario

Demographic scenario

Groups together multiple zones (zone hierarchy) with associated data, samples and synthetic population

Zonal inputs preparation:

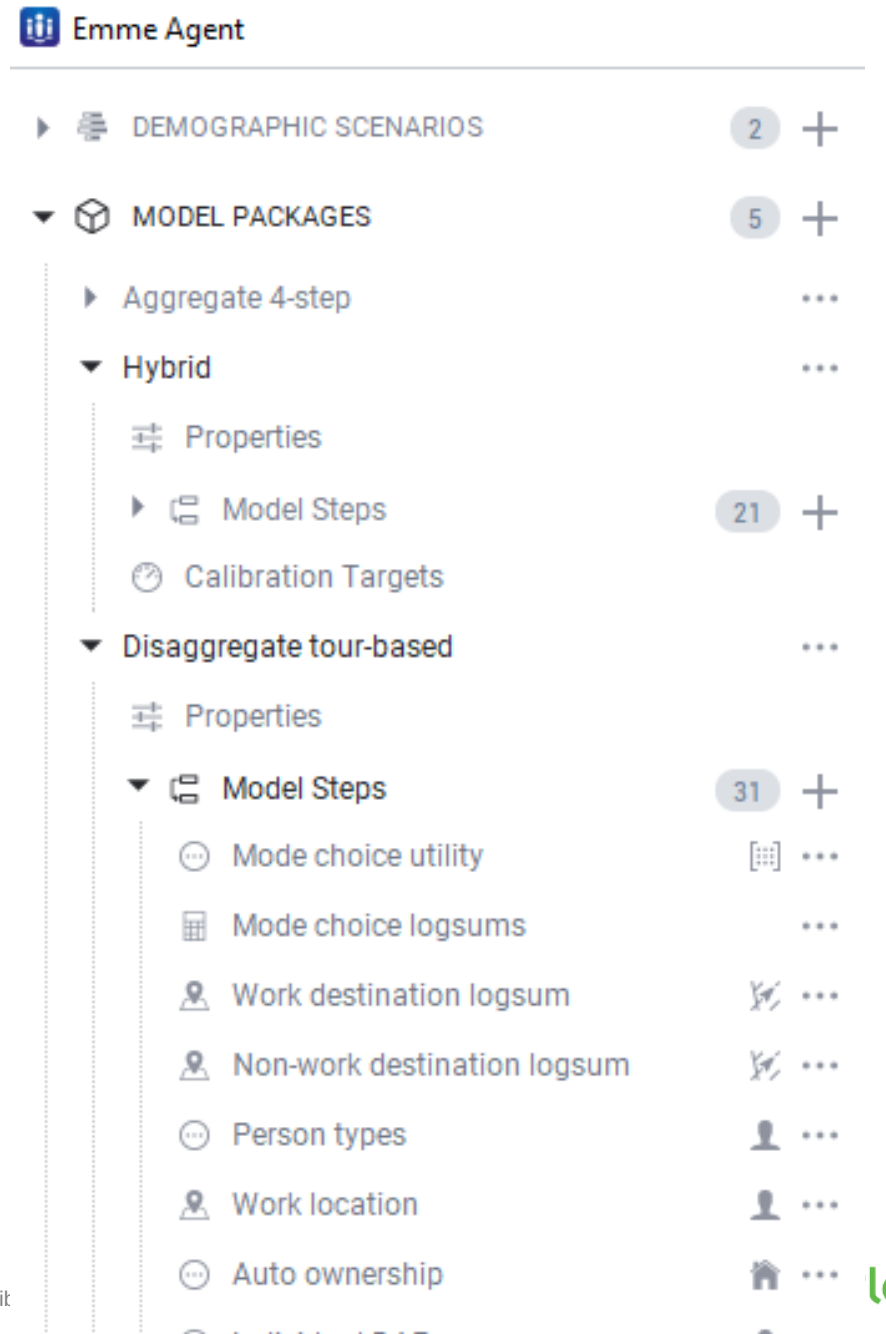
- Existing CUBE scripts
- Prepare inputs in CSV format
- Create a new demographic scenario

Model package

Model package

- Demand model can be decomposed as a sequence of choice models and intermediate data processing

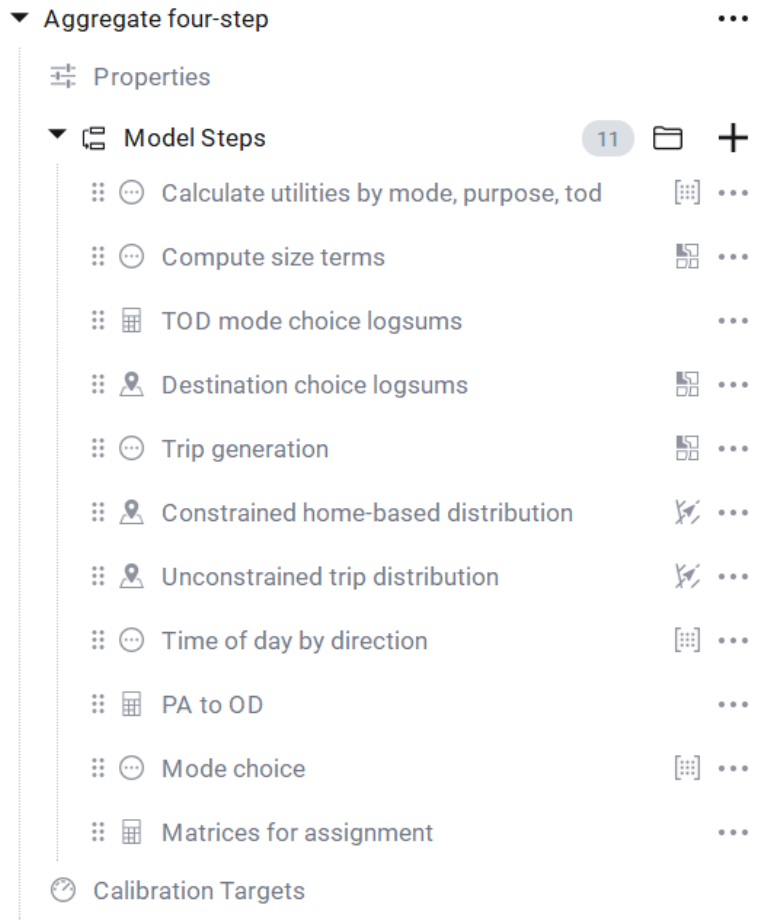
- Model package is the sequence of choice model and data processing configuration

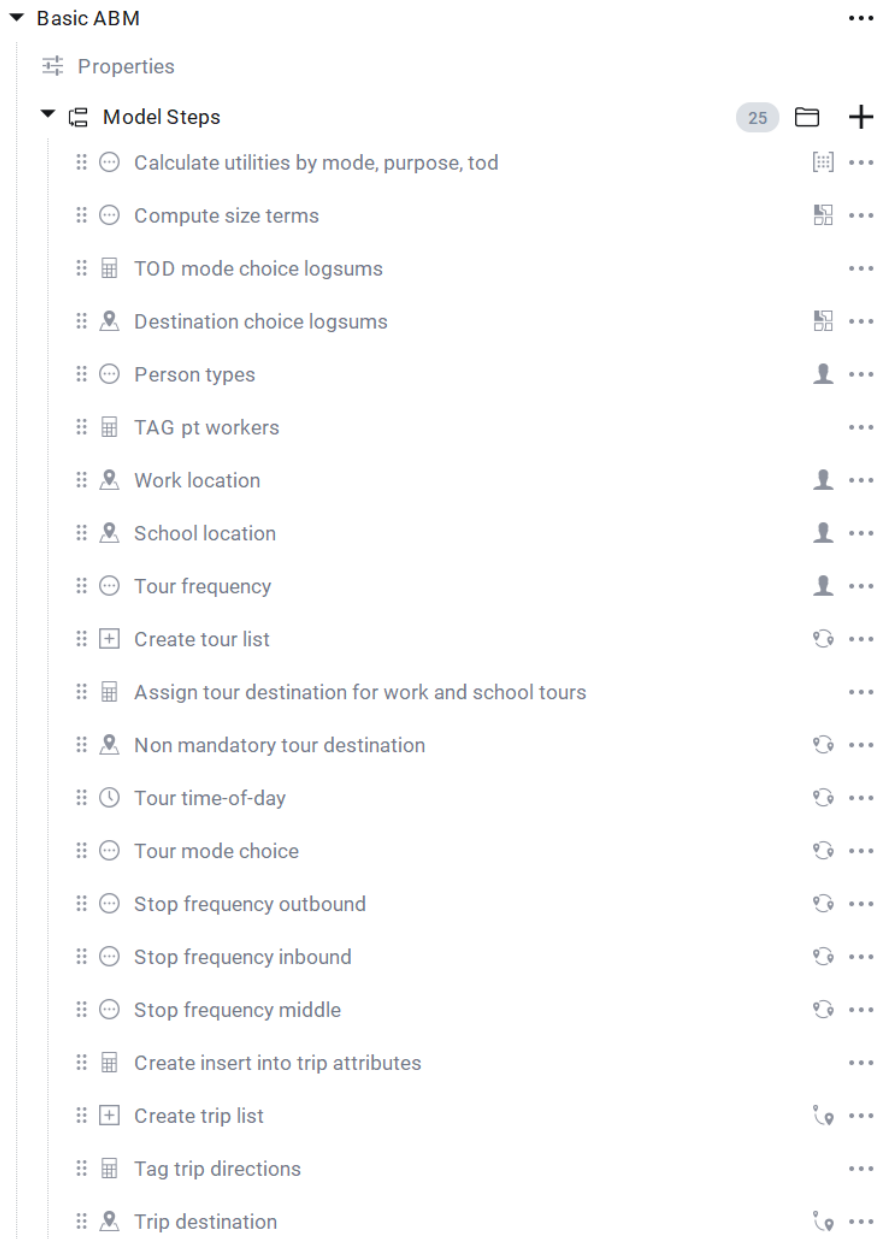


Model package: Examples

Demo:

- 4-step model
- Lima ABM





Integration of different data sources in systematic calibration of travel demand model system

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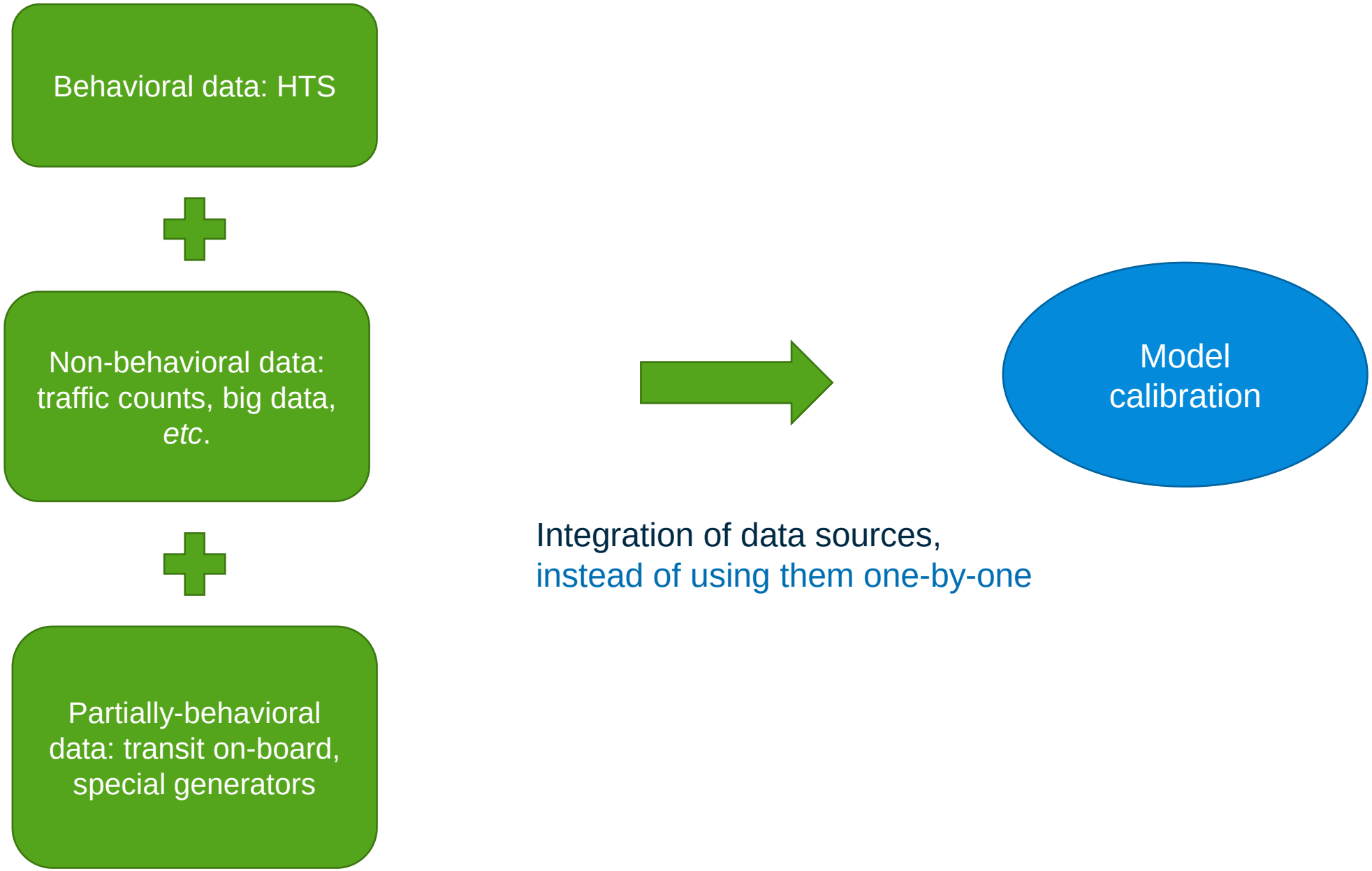

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Working example using Lima ABM

- Calibration to StreetLight O-D data
- Ongoing steps:
  - Configuration of calibration to counts
  - Configuration of calibration to StreetLight data + counts (data integration)

What model parameters are affected by the StreetLight data?

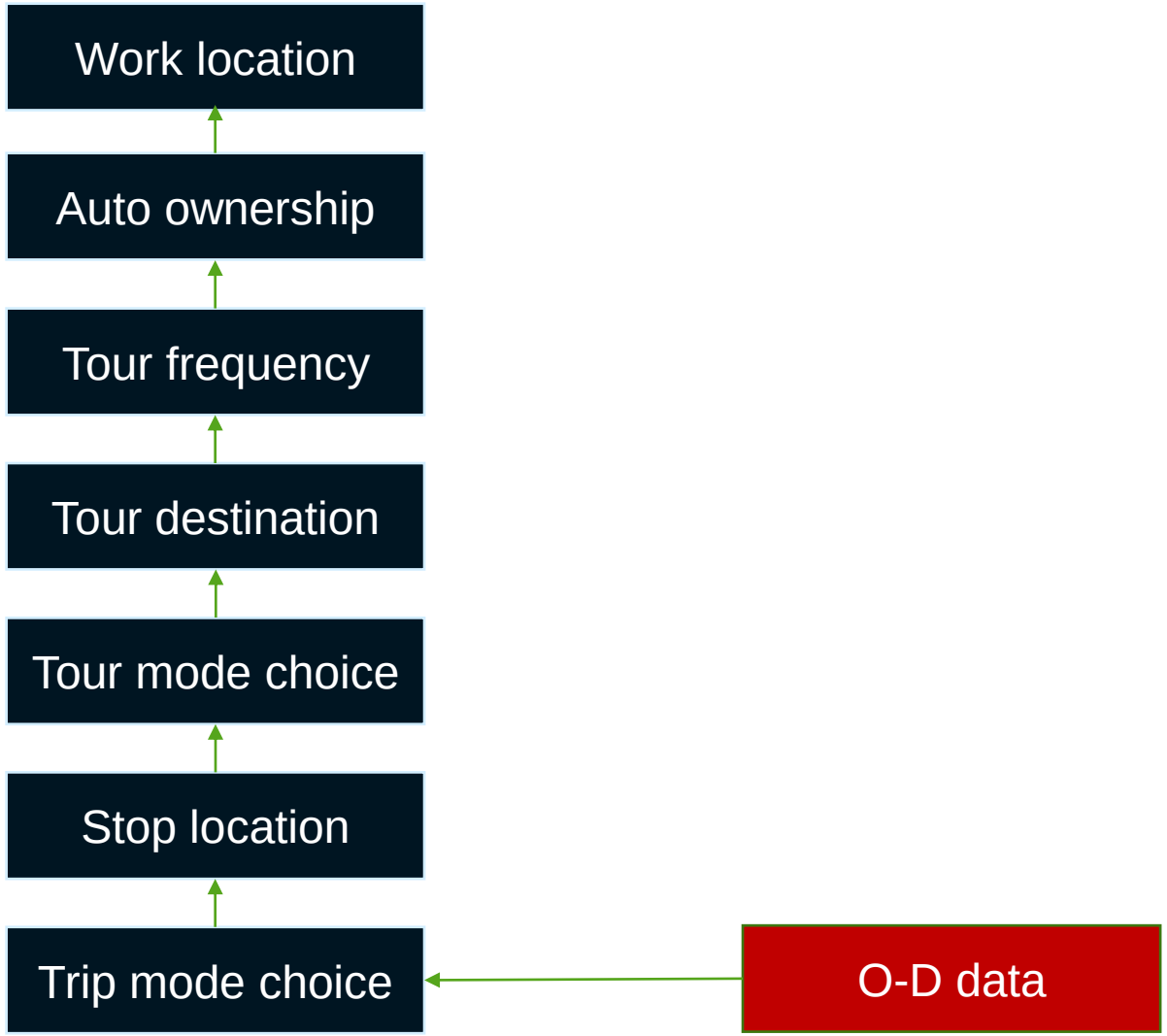
- Dispersion coefficient
- Intra-zonal preference

- Auto ownership constants

- Tour frequency constants

- Dispersion coefficient
- Intra-zonal preference
- Attraction rates

- Dispersion coefficient
- Intra-zonal preference
- Attraction rates



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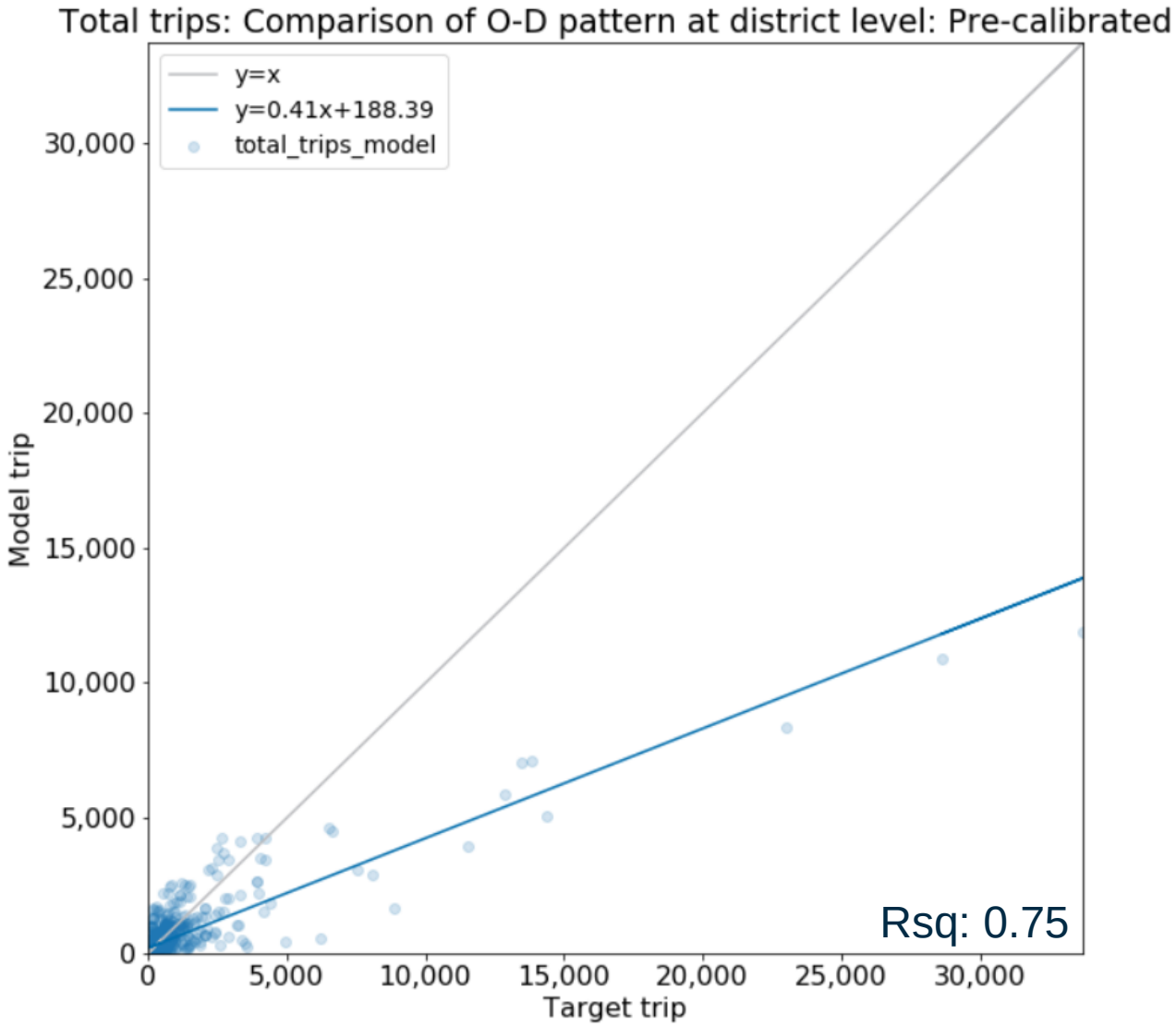
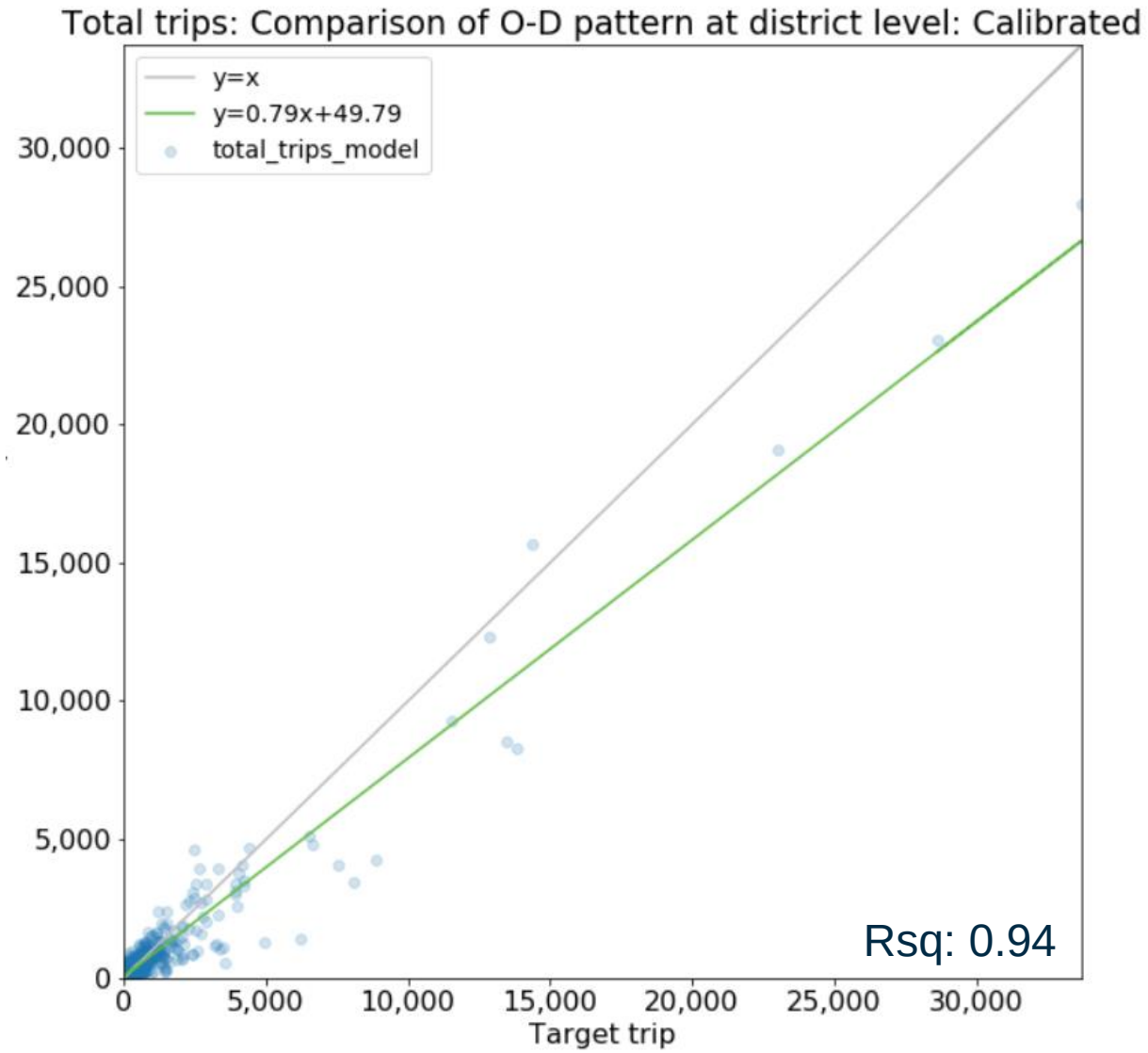
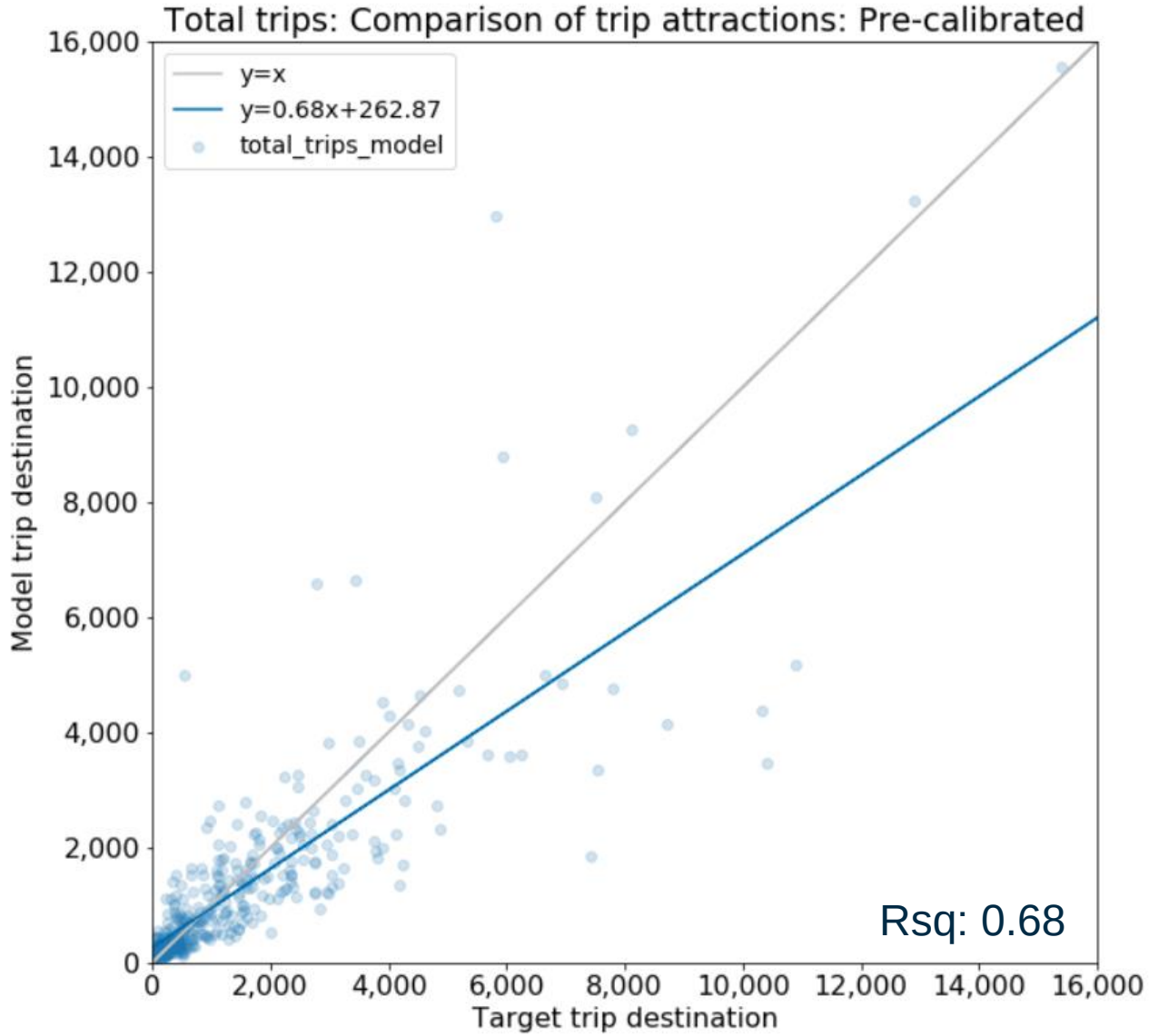
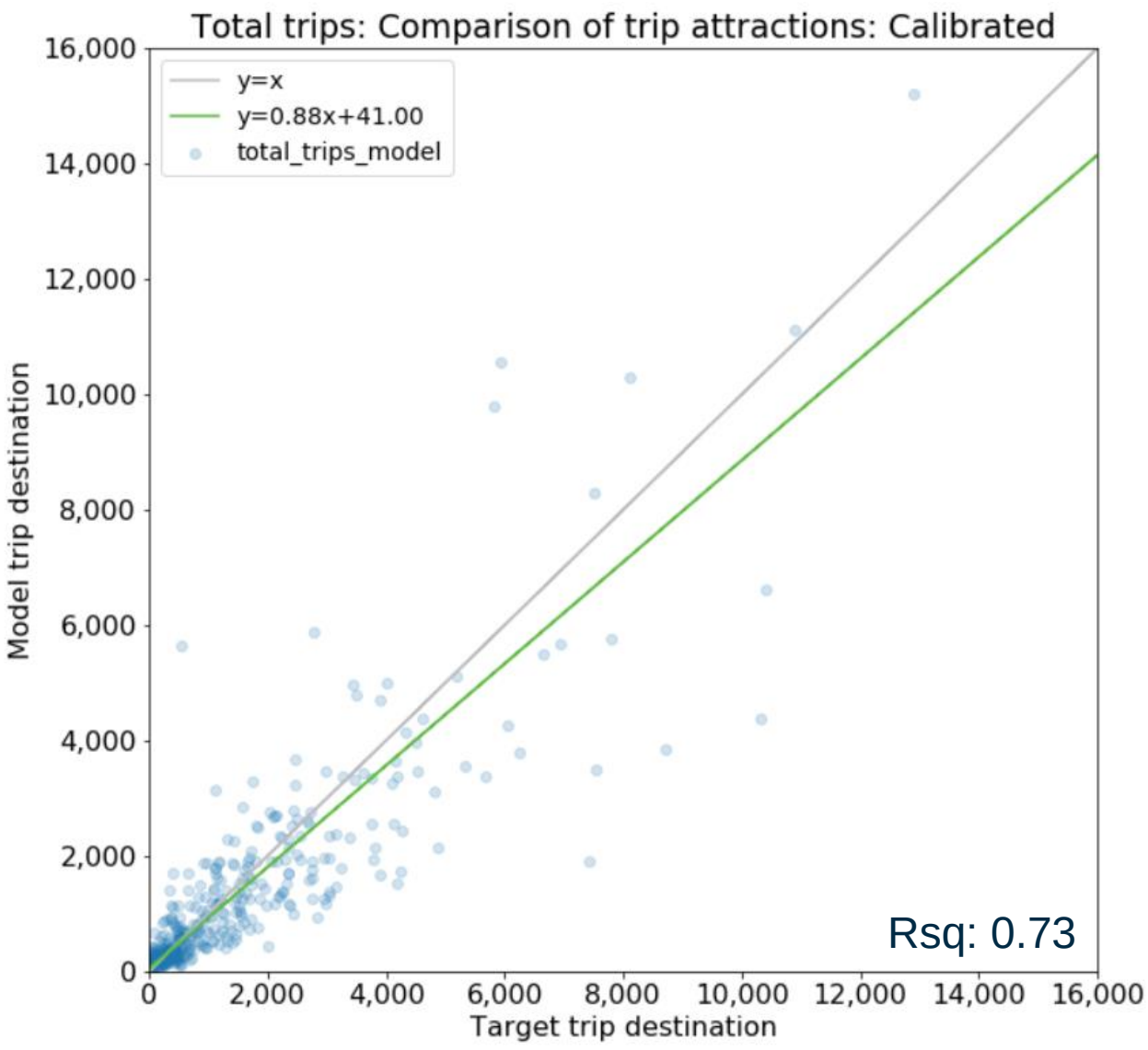
Calibration results: Validation of district level flow





Calibration results : Validation of trip attractions





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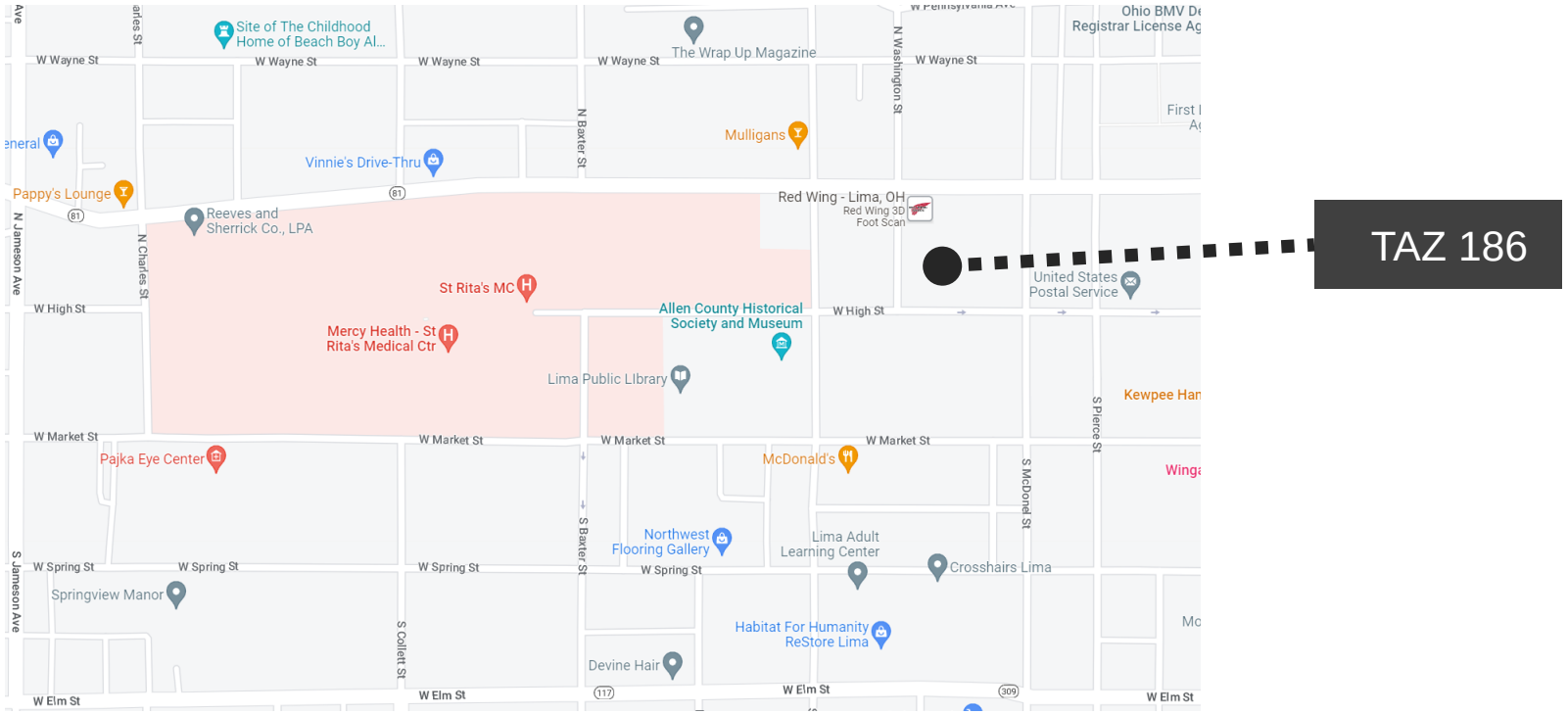
Calibration procedure as a data outlier screening tool

TAZ ID	Total trips in StreetLight data	Total trips in the model	Population	Total employment
186	533	5,235	49	1,052
319	15	89	83	150



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What model parameters are affected by the AM traffic counts?

- Auto ownership constants

- Tour frequency constants

- Dispersion coefficient
- Intra-zonal preference
- Attraction rates

- AM constants

- Auto mode constants

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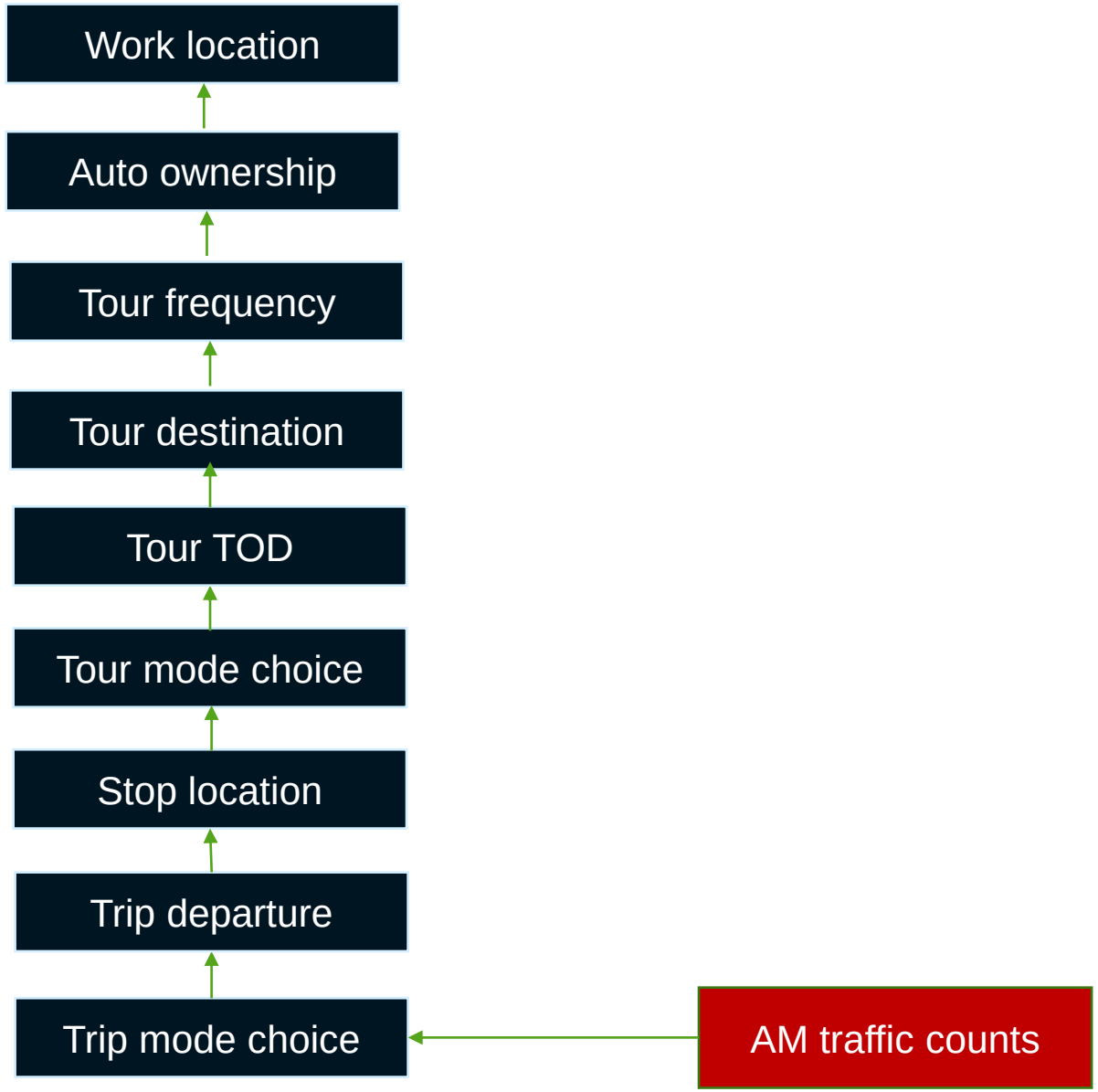

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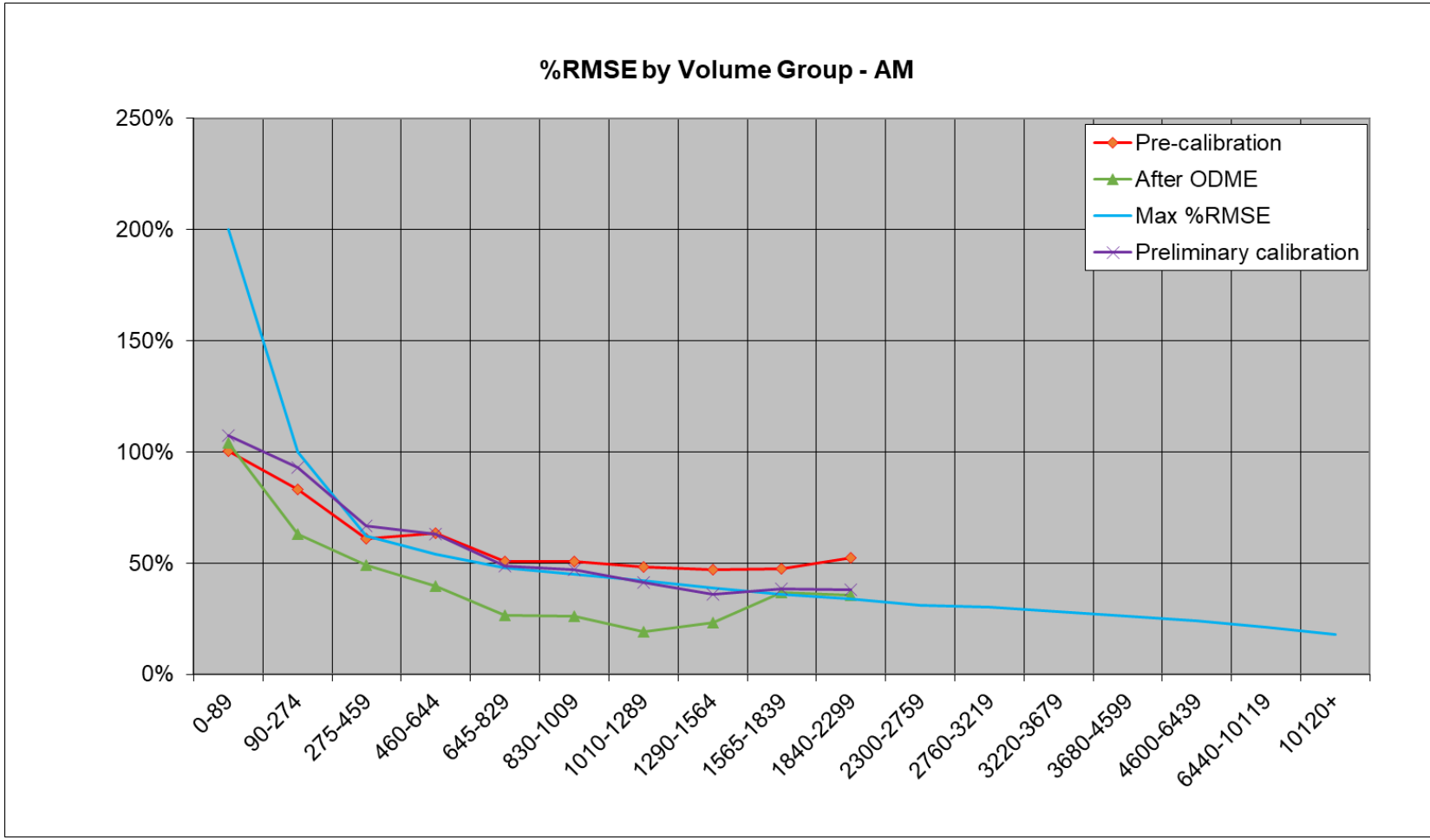
Preliminary calibration result: AM traffic counts

- 3 global iterations for updating LOS (equilibration)
- 3 internal iterations for each global iteration for updating calibration parameters

%RMSE

Pre-calibration = 91%
After ODME = 59%
Preliminary calibration = 82%



Calibrated %RMSE will always be between pre-calibration and after ODME

