

ptv vision

PTV Vision – Tutorial
Four-Step Demand Modeling with VISUM



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About this Tutorial

This document is part of the tutorial on the PTV Vision product family by PTV AG. It is designed to assist users of these products by explaining step by step the common procedures of project work.

The tutorial unfolds its full usefulness together with your version-specific manual. In the tutorial you learn which decisions to make and which steps to take. The users manual provides you with information how to take the steps with the program version available.

The text is accompanied by an example referred to at specially indicated points. To enable you to follow the steps shown, this example, including other required data, has been stored in various processing stages on the DVD enclosed. At the end of the main text you will find a list of all included data referenced in the text.

You may work through the tutorial using the data on the DVD. If you want to make modifications and carry out the tutorial examples, we recommend making a copy of the complete appropriate version tree (VISUM9 or VISUM10 according to your VISUM version) on the DVD in a directory on your computer. In case you are not equipped to read DVDs please contact PTV to get a copy of either the VISUM 9 or VISUM 10 data on CD.



Note that this is recommended since Procedure 48 (Run Script - modeSplitReport.py) writes a log file to the location of the example data.

If you work with VISUM, first set the project directories on the enclosed folders entitled VISUM_NETWORKS for version files and ADDITIONAL_DATA for all other file types. The version files can be opened with VISUM version 9.44 and higher.

The editorial staff of the PTV Vision tutorials hope that you enjoy an interesting and instructive read!

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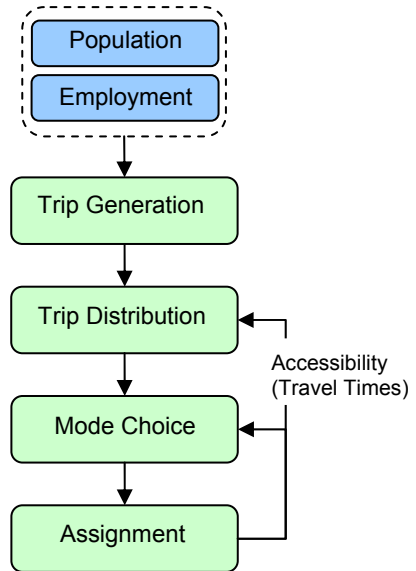
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1.3 The Four Step Model

The four step model consists of four primary steps. The diagram below depicts the four step process. In general, the four steps can be described as follows:

- ▶ **Trip generation** – calculate the number of trips in each zone as a function of population, employment, and other variables.
- ▶ **Trip distribution** – Distribute trips generated in each zone to a destination zone based on zone attractiveness and accessibility (time) to get there.
- ▶ **Mode Choice** – Once trips have been distributed from origin to destination zone, choose a mode (auto, bus, walk) of transportation.
- ▶ **Assignment** – Finally, calculate the path (route) taken for each trip from origin to destination by each mode.



The trip distribution and mode choice steps are a function of network accessibility (travel times) between origins and destinations, which is calculated during the assignment step. Because the steps depend on one another, an iterative solution is required until a relatively stable solution is calculated (or in other words, an acceptable level of convergence is met).



Most four step models are aggregate models. This means that they model trip making with aggregate objects (zonal) as opposed to a disaggregate objects (households or individuals). For example, trips are generated for each zone in the model as opposed to for each household in the model. This is explained in detail in the Four Step Process section.

Trips

Most four step models in practice are trip-based models. A few definitions according to the field of four-step demand modeling are needed at this point:

- ▶ Trip: a roundtrip journey from an origin to a destination and return
- ▶ Directional Trip: a one-way journey from an origin to a destination
- ▶ Tour: A sequence of stops that eventually returns to the origin
- ▶ Home-Based Trip: A trip that begins and ends at home
- ▶ Non-Home-Based Trip: A trip that does not begin or end at home