CALIBRATION OF A MODAL SPLIT MODULE FOR THE TRAFFIC SIMULATION MODEL OF THE VENICE MUNICIPALITY

CLIENT: Mobility Department of the Municipality of Venice

YEAR: 2003

DESCRIPTION OF ACTIVITIES:

The Mobility Department of the Municipality of Venice charged TRT to build a modal split module for the traffic simulation model of the land side of Venice Municipality, developed in an EMME/2 software.

The aim of the module was to allow the use of the traffic model to simulate several policy scenarios and to forecast the amount of demand which would shift on different mode as a consequence of changes of transport supply.

Namely, the policies to be simulated with the model were changes of the road network (new roads, enlarging roads, closing roads, etc.), new public modes (tramway and “sub-lagunare”) on pre-definite paths, revision of tolling system on the motorway links to/from and through Venice-Mestre and public transport fares changes, including a common fare for road and rail.

Main activities

The main activities carried out during the work concerned with:
- definition of the methodological approach on which establish the modal split module;
- definition of the implementation requirement to interface the module with the EMME/2 existing traffic model;
- preparation of the input data and of the procedure to update such data both endogenously and exogenously with respect to the traffic model;
- calibration of the parameters of the modal split module.

Features of the modal split module

The modal split module deals with the problem of a binomial choice between a “private” mode and a “public” mode, where the “public” mode includes both bus and train and – in the future – tramway lines. The parameters of the module are differentiated by trip purpose: i.e. the two matrices – commuting and other purposes – works independently.

The modal split module starts reading the matrices output of the EMME/2 assignment model (trip times separated in various components, trips costs of “private” mode) and other exogenous input matrices including those elements that the assignment model cannot produce (e.g. the matrix of the disutilities due to the need of changing public vehicle along the route).

Using such data and other parameters (e.g. the value of transport time estimated in an SP survey carried out by TRT in the year 2002), the modal split module computes the modal shares on each O/D pair, by using a Logit algorithm, and, therefore, the new trip matrices by mode (summing over trip purposes). The new matrices are assigned and the process is iterated until either convergence is reached or a maximum number of iterations is reached.

Peculiar elements of the modal split module are specific parameters named “residual disutilities”. Such parameters take into account local circumstances (specific for each O/D pair) which contribute to explain the observed modal split at the base year. They have been computed by applying the Logit formula backwards starting from the observed shares as known elements. Such parameters enter in the modal split algorithm as fixed elements, which not require a following re-estimation.

Through different trials and sensitivity tests, the parameters of the modal split module have been – calibrated in order to produce a module with a reasonable elasticity.

Working scheme of the modal split module