

REGGIO EMILIA URBAN MOBILITY PLAN – LAND USE MODEL

CLIENT: *Comune di Reggio Emilia*

YEARS: 2006 - 2007

DESCRIPTION OF THE ACTIVITIES

Objectives

The strategic land-use model for Urban Mobility Plan of Reggio Emilia was realised with two main objectives:

- a) to estimate the origin/destination matrices of passenger mobility within the study area (the municipality of Reggio Emilia and other neighbouring municipalities) for the different future scenarios representing the alternative policy measures of the Urban Mobility Plan;
- b) to provide information on the variations of land use (re-locations of households and jobs) caused by the different policy alternatives.

Project structure

The study was carried out in three main steps:

- first, the land use model was set up using several data sources and calibrating its parameters against observed data for the base year (2005);
- second, the model was used to quantify the land use reference scenario according to the forecasts concerning land use, demography and infrastructures;
- finally, the model was used to study the impacts of three alternative scenarios, each featuring a specific set of transport policies – infrastructures, regulation, etc. – at the study area level.

Methodology

The land use model was implemented as an application of the software MEPLAN, providing an integrated land use and transport platform. The Reggio Emilia model was based on five basic factors:

- a) groups of households;
- b) groups of individuals;
- c) employment segmented by macro-sectors;
- d) Floorspace segmented by user activity (residential, industry, retail and services);
- e) Trips segmented by trip purpose.

In the model, the household groups demand residential floorspace and therefore choose where to locate themselves. Furthermore, households groups give rise to

individuals groups, which generate mobility demand in the area.

Economic activities choose location as well as households and the distribution of activities over the study area affects the mobility pattern as they act as trip attractors. As in the model there are several subject demanding floorspace, this is segmented by user activity.

The origin-destination trip matrix, segmented by trip purpose, is function of the generating potential, the attracting potential of each zone as well as of the disutility of transport between each zone pair. Disutilities were assumed exogenously from the land use model, but endogenously in terms of the modelling tools used for the study as they were provided by the transport model fed with the origin-destination matrices. As a matter of fact, the alternative scenarios consisted in a different set of transport disutilities, each deriving from different assumptions about the transport supply in the study area.

Main outcomes

The land use model was used to simulate three alternative scenarios:

- a “loosening scenario”, where it was assumed that all the infrastructure policy lines are put into practice: improvements of urban public transport, opening of two new rail links and building several new road stretches;
- an “innovative scenario”, especially focused on the improvement of urban transport, in particular with the introduction of electric transit vehicles on the major routes;
- the “plan scenario”, including all the policy measures, both for the private transport (new infrastructures) and for the public transport.

For each scenario the land use model produced an origin-destination matrix and the estimation of the expected impacts in terms of location choices:

- the “loosening scenario” would give rise to a larger attractiveness in Reggio Emilia, especially in the peripheral areas, where the reduction of the transport costs is wider, to and from both the city centre and the rest of the province;
- the “innovative scenario” would have very limited impacts on locations, since transport costs would

change in a minor way because of the mode shift from car to public transport (which is the effect of the scenario on the transport side): the lower congestion is offset by higher travel times when using the public transport;

- the “plan scenario” would also increase the attractiveness of Reggio Emilia in comparison to the

reference scenario. The reason is a small reduction of generalised cost of trips throughout the study area. Therefore, it is not expected that households would move from some parts of the town to others, but the whole municipality would gain new inhabitants.

