ISHTAR

Integrated Software for Health, Transport efficiency and Artistic heritage Recovery

The main 'global' target of the ISHTAR Project (contract No. EVK4-CT-2000-0034) was to develop a suite of models which allowed the evaluation of impacts from various types of urban policies and actions on the quality of life of citizens, and in particular on traffic congestion, air quality, citizens health, conservation of cultural heritage. The specific scientific and technical objectives of the ISHTAR suite of models were:

- **Integration of a relevant number of modeling tools**

The ISHTAR Suite proposal to the EC was based on seven distinct work packages which aimed at modeling the various aspects of the impact analysis of short-term actions and long-term policies.

This integration represented a significant technical achievement. Standard models suites normally include only a few of those models. It also represented a strong enlargement of the applicability area, since with this kind of 'multi-impacts' suite the city administrations and their consultants were able to analyze in an integrated and 'coherent' way the various aspects of 'global' urban policies, without having to perform separate studies relying on different input information providing less credible conclusions.

- **Evolution of modeling techniques in crucial impact areas**

✓ The scientific core value of the ISHTAR proposal was largely linked to a few crucial modeling developments on which the accuracy and the significance of the results deriving from the Suite application strongly depended. These areas of 'development' can be summarized as:

✓ Prediction of the effects of citizens' reaction to postulated measures (WP1).

✓ Improvement of the modeling of vehicle emissions (WP3), particularly concerning the consideration of speed variability along the network links, and the spatial-temporal distribution of 'cold-emissions' depending on the representation of trip origins (e.g. parking places).

✓ Development of an urban road safety modeling approach, which took into account the composition of the local fleets and also the variable speed levels in the network and the adverse factors such as the presence of intersections (WP3).

✓ Detailed estimations of pollution effects on citizens' health (WP6) based on an analysis of population groups' movements in the day and the

4-dimensional maps of pollution and noise produced by the tools selected in WP4: this represented a great step towards 'aggregated approaches'.

- **Realization of integrated specific modules inside the Suite.**

The ISHTAR project was globally aiming at maximum flexibility of use: this was particularly reflected in some of the Work Packages. The choice of building an 'Integrated Transport Module' which contained two or three different models, having complementary characteristics in terms of applicability field, so that the future user would be theoretically capable of analyzing 'any' kind of urban policy implying (as nowadays is the rule…) transport system planning and/or management was of particular relevance.

Relevantly to the consequence of this flexibility in transport modeling, the downstream models (emission, noise, safety, exposure models) were flexible in their input characteristics in order to give the proper accuracy whichever transport model was used in a given analysis. This implied the use of 'advanced' emission, noise and safety models capable of treating flexible input information.

- **Space and Time total flexibility**

Among the crucial prerequisites of the ISHTAR Project, a total flexibility in space and time domains of analysis played an essential role.

The starting point for the achievement of this goal was the realization of the 24h capability: traffic flows, vehicles speed, emissions, noise levels, pollution levels were calculated (when needed) hour by hour thanks to the characteristics of the transport, emission, noise and dispersion models that were selected. In WP1 and WP2 solutions were given for estimating the variation of the origin-destination matrices during the day. The 'direct impact module' (WP3) included a 'spare' solution consisting of the use of peak hour transport distribution integrated by statistics of daily traffic profiles on characteristic link conditions.

This capability to run impact analysis 'hour by hour' (or 'day by day' on a longer scale) guaranteed a level of refinement that many standard current analyses based only on peak hour conditions cannot reach.

The space flexibility was normally not a problem for any network transport model: but it was evident that having (e.g.) three different transport models in the WP2 integrated module (such as a classic assignment model, an advanced dynamic traffic model and a micro-simulator) allowed an inherent 'zooming capability'.