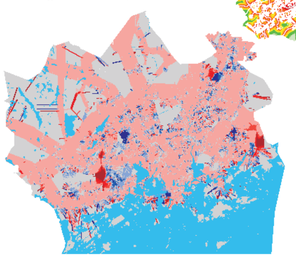
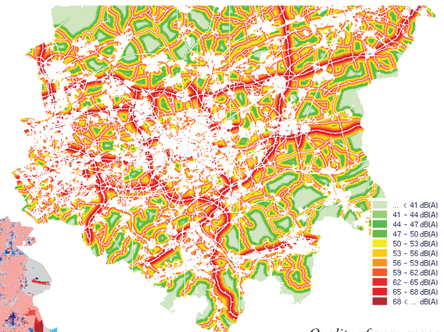
Raster Method

Difference in noise levels between base scenario and existing conditions (Helsinki).

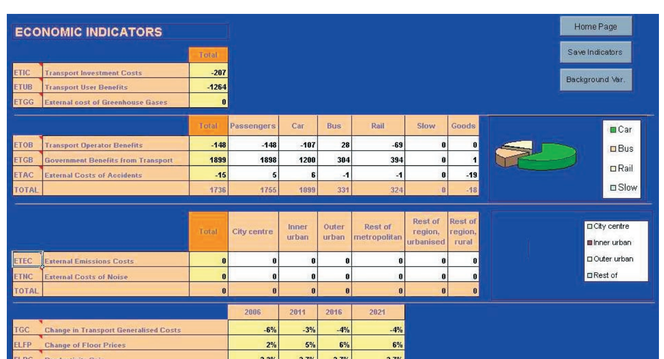




Quality of open space in Dortmund

The GIS based Raster method produces important indicator values and illustrates the results in 100 m x 100 m cells

Economic Evaluation



ECONOMIC INDICATORS

Home Page | Save Indicators | Background Var.

		Total
ETIC	Transport Investment Costs	-207
ETUB	Transport User Benefits	-1264
ETGG	External cost of Greenhouse Gases	0

		Total	Passengers	Car	Bus	Rail	Slow	Goods
ETOB	Transport Operator Benefits	-148	-148	-107	28	-69	0	0
ETGB	Government Benefits from Transport	1899	1898	1200	304	394	0	1
ETAC	External Costs of Accidents	-15	5	6	-1	-1	0	-19
TOTAL		1736	1755	1099	331	324	0	-18

Car, Bus, Rail, Slow

		Total	City centre	Inner urban	Outer urban	Rest of metropolitan	Rest of region, urbanised	Rest of region, rural
ETEC	External Emissions Costs	0	0	0	0	0	0	0
ETNC	External Costs of Noise	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

City centre, Inner urban, Outer urban, Rest of

		2006	2011	2016	2021
TGC	Change in Transport Generalised Costs	-6%	-3%	-4%	-4%
ELFP	Change of Floor Prices	2%	5%	6%	6%
ELPG	Productivity Gain	2.3%	2.7%	2.7%	2.7%

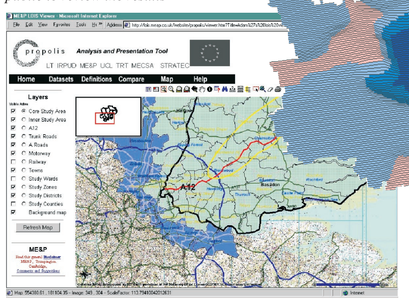
Economic evaluation is based on model run-results and calculations are made within a separate Economic Indicator Module

propolis

DG Research

Analysis and Presentation Tools

The Internet based Analysis and Presentation Tool makes it possible for the experts and public to review the results



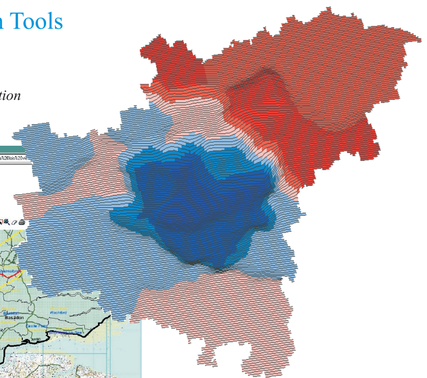


Illustration of the effect of compact city scenario on car-km per capita per day

Special tools are developed to help the interactive communication with public including internet applications and advanced illustration methods

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For more information, see www.ltcon.fi/propolis

PROPOLIS is part of Land Use and Transport Research Cluster LUTR. See www.ess.co.at/LUTR/

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DG Research

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PROPOLIS (Planning and Research Of Policies for Land Use and Transport for Increasing Urban Sustainability) *is a research project within the Fifth Framework Programme of the EC. It belongs to the Thematic Programme "Energy, Environment and Sustainable Development" and its Key Action "City of Tomorrow and Cultural Heritage". It is funded by DG Research and national organisations from six countries Finland, Germany, UK, Belgium, Italy and Spain. The project started 1.1.2000 and will be completed by the end of 2002.*

Abstract

The objective of PROPOLIS is to research, develop and test integrated land use and transport policies, tools and comprehensive assessment methodologies in order to define sustainable long term urban strategies and to demonstrate their effects in European cities.

The work is executed through developing a set of indicators measuring the environmental, social and economic components of sustainability. Values for these indicators are calculated using enhanced urban land use and transport models and new GIS and Internet based modules. A decision support tool is used to evaluate the sets of indicator values in order to arrive at aggregate environmental, social and economic indices for the alternative policy options. To include the long run land use effects a time horizon of 20 years or more is used.

In close contact with Client-Partners and international networks the system is used to systematically test and analyse policy options in 7 European cities in order to arrive at optimum combinations of different policy types (land use, transport, regulatory, investment, pricing and fiscal measures).

General recommendations for European cities are made based on the analysis of the policy testing together with city specific demonstrations of their effects. These effects address important issues, such as CO2 emissions, energy use of transport and land use, employment, regional economy and competitiveness, biodiversity, justice of the distribution of impacts, opportunities of people, exposure to noise and pollutants etc.

The innovations of the project are related to the integrated and comprehensive approach. The approach is also likely to produce innovative policy recommendations as the system is able to reveal the interactions and multiplier effects by following the impact chains in the system.

The results include evidenced strategies for improved sustainability, for instance a radical reduction of urban pollution and congestion.

Objectives

The goal of PROPOLIS is to research, develop and test integrated land use and transport policies, planning tools and comprehensive assessment methodologies in order to define sustainable long-term urban strategies and to demonstrate their effects in European cities.

To reach this goal the project develops a comprehensive and integral framework of methodologies, including integrated land use, transport and environmental modelling, indicator, evaluation and presentation systems.

The more detailed goals and ways to achieve them are presented below.

To develop further the theory of urban transport and land use systems by:

- developing the feed-back link from environment to land use and transport in order to have fully integrated *urban land use, transport and environmental models*
- developing and adapting recent studies and *theories concerning economic evaluation* in land use/transport models

To develop the planning and assessment methodologies further by:

- introducing *new essential key indicators* addressing, for example, employment, regional economy, biodiversity, accessibility, and total energy use by the land use and transport systems
- developing an *internet-based analysis tool to facilitate inter-city comparisons* and by improving access to results/information for the wider user community.
- *automating the data flows between different modules* in order to have a more efficient tool for policy testing
- developing and testing the *evaluation methods through a decision support tool*, which is developed in close contact with Client-Partners, to be more user-friendly and transparent.
- *developing the overall framework* to be more general and open for different types of models and by producing data on different indicators for benchmarking purposes.

To execute a policy testing process in 7 European urban regions by:

- *using the knowledge already gained* from the numerous tests made in the case cities and by concentrating on the most promising ones
- *executing a systematic process* of policy testing including innovative policies and their combinations
- studying, as a priority, the definition and the application of an *optimum level of pricing, its combinations with other policies and the long-term land use effects.*

To search for optimum policy combinations for each of the case cities and to demonstrate their effects.

To analyse the test results in order to define general urban strategies, to demonstrate their effects in the case cities and to aim for generalised conclusions that are not dependent on the test cities nor the models used by:

- using a variety of different state of the art urban land use and transport models
- using a variety of different types of test cities
- using exactly the same indicators for each city to measure the effects in order to have comparable results

To identify policy packages that are likely to achieve the following goals, among others, without compromising economic efficiency and social sustainability (compared with the base scenarios):

reduction of greenhouse gases from the urban land use and transport system	*>20 %*
reduction in energy use of the urban transport system	*>20 %*
reduction in traffic accidents	*>15 %*

These policy packages are likely also to *reduce urban pollution and congestion while, at the same time, ensuring accessibility and mobility.*.

To establish close contacts with the policy and decision makers and users of the system

To adopt an effective dissemination and exploitation programme during and after the project

Points of departure

Urban sustainability

Sustainable development is usually viewed as consisting of three dimensions: Environmental and ecological, Socio-cultural and Economic. PROPOLIS will build on this theory.

Indicators

Indicators will be used to measure the above three dimensions of urban sustainability.

Special demands that the PROPOLIS indicators have to fulfil include:

- They should measure relevant aspects of sustainability and have a sound theoretical background.
- The project has to be able to forecast the indicator values into the future. This is an essential difference compared with monitoring indicators.
- The indicators, to be relevant in PROPOLIS context, should be policy sensitive.

Models and Tools

The project builds on state-of-the-art urban land use and transport models. In addition, a number of other models will be adapted including emission, dispersion and exposure models. For certain indicators new models have to be developed during the project, addressing land consumption, biodiversity, energy use in buildings, economy etc.. Geographical space is the common factor linking the different levels, scales and stages of analysis.

Assessment

PROPOLIS will use both cost-benefit and multicriteria analysis methods. The economic index value for the economic component of sustainability will be based on cost benefit analysis but the environmental and social dimensions of sustainability are measured using multicriteria analysis. The assessment will take place using an existing decision support tool to be enhanced to meet the needs of group decision making, coping with uncertainty and citizen's involvement through internet application.

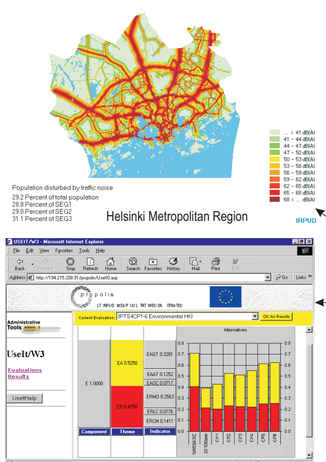
Policies and Policy testing

Potential policy options are defined using the external and national networks of the project. Special emphasis is on policies, which have been implemented with success in Europe.

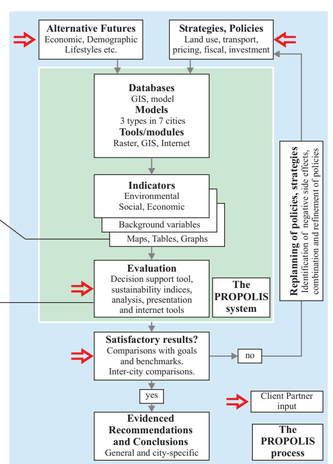
Part of the tests are the same for all test cities. However, as every city is individual the best policy combinations are likely to differ. This is why optimum policy combinations are sought also separately for each city.

The PROPOLIS approach, process and system

The PROPOLIS approach and process is illustrated in the figure below.

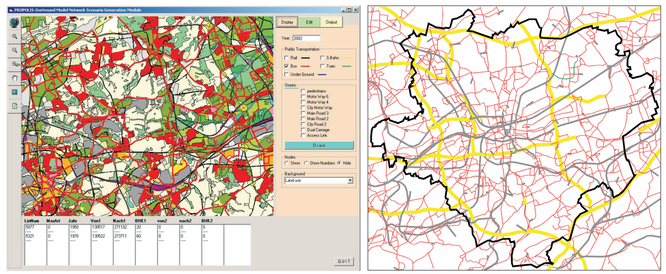


USE-IT, the interactive internet evaluation tool



The PROPOLIS approach, process and system

Land Use and Transport Models



PROPOLIS uses three different types of advanced land use and transport models as a platform for policytesting

Indicators

COMPONENT	THEME	INDICATOR
Environmental	Global climate change	Greenhouse gases from transport Greenhouse gases from land use
	Air pollution	Acidifying gases from transport Acidifying gases from land use Volatile organic compounds from transport
	Consumption of natural resources	Consumption of mineral oil products, transport Consumption of mineral oil products, land use Land coverage Need for additional new construction
	Environmental quality	Fragmentation of open space Quality of open space
Social	Health	Exposure to particulate matter from transport in the living environment Exposure to nitrogen dioxide from transport in the living environment Exposure to traffic noise Traffic deaths Traffic injuries
	Equity	Justice of distribution of economic benefits Justice of exposure to particulates Justice of exposure to nitrogen dioxides Justice of exposure to noise Segregation
	Opportunities	Housing standard Vitality of city centre Vitality of surrounding region Productivity gain from land use
	Accessibility and traffic	Total time spent in traffic Level of service of public transport and slow modes Accessibility to city centre Accessibility to services Accessibility to open space
Economic indicators	Total net benefit from transport	Transport user benefits Transport operator benefits Government benefits from transport Transport generalised costs Transport investment costs Transport external accidents costs Transport external emissions costs Transport external greenhouse gases Transport external noise costs
	Total net benefit from land use	Change of floor prices

PROPOLIS, indicative list of urban sustainability indicators. In addition a set of background variables illustrating the characteristics of policy option will be produced