

Urban Planning in European Research - The Land Use and Transport Research Cluster

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1. INTRODUCTION

The paper will present European research activities dealing with integrated land use and transport planning. These research activities are located under the key action of *City of Tomorrow and Cultural Heritage*, a part of the *Energy, Environment and Sustainable Development (EESD)* which is a thematic programme of the *Fifth Framework Programme (FP5)*.

The *Fifth Framework Programme* sets out the priorities for the European Union's research, technological development and demonstration (RTD) activities for the period 1998-2002. These priorities have been selected on the basis of a set of common criteria reflecting the major concerns of increasing industrial competitiveness and the quality of life for European citizens. *FP5* has a multi-theme structure, consisting of seven Specific Programmes, of which one is the *Energy, Environment and Sustainable Development* thematic programme.

The overall goal of *EESD* is to contribute to sustainable development by focusing on key activities crucial for social well-being and economic competitiveness in Europe. The use of the knowledge and new technologies developed by this programme will enable the satisfaction of a wide range of social and economic needs of reconciling economic development with environmental sustainability.

A major innovation of *FP5* is the concept of "Key actions". Implemented within the specific programmes, these flexible instruments aim to find solutions to topics of great concern in Europe. Key action 4 is called *City of Tomorrow and Cultural Heritage* and is targeted at improving quality of life in urban areas across Europe, promoting sustainable development in European cities and maintaining competitiveness. This research includes a mixture of socio-economic, environmental and technological approaches. There are four interrelated research areas within the *City of Tomorrow and Cultural Heritage* key action:

- Sustainable city planning and rational resource management;
- Protection, conservation and enhancement of European cultural heritage;
- Development and demonstration of technologies for building conservation;
- Strategies for urban transport systems.

The projects which will be presented in this paper belong altogether to the latter area - strategies for sustainable urban transport systems.

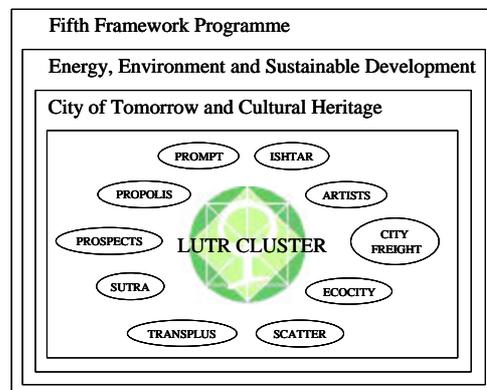


Figure 1: Structure of EU research on urban planning

Within these projects more than 100 research institutions from all over Europe including Central & Eastern European countries (CEEC) are looking for integrated land use and transport strategies for the City of Tomorrow. Approximately 200 man years and a funding of 22 million Euro enable research on this field. A total of 74 European cities are investigated by empirical case studies to prove theoretical hypothesis. To concentrate the knowledge produced in these projects a *Land Use and Transport Research (LUTR)* cluster was created.

The common objectives of *LUTR* projects are to develop strategic approaches and methodologies in urban planning which contribute to the promotion of sustainable urban development. Research is especially focussed on integration of transport and land use policies into urban management strategies. Results should be tools for better managing transport demand in medium and long term. Such tools should ideally serve to develop strategies that:

- Reduce transportation-related problems and externalities
- Encourage greater use of sustainable modes of transport (public and non-motorised transport) whereas limiting individual motorised vehicle trips

2. CLUSTER ACTIVITIES

The *LUTR* cluster is an umbrella organisation, which pools meanwhile 10 projects researching on the field of integrated land use and transport planning. The objectives of the cluster are:

- To ensure consistency and co-ordination between the projects, researchers and stakeholders
- To contribute to the reduction of barriers to sustainability more effectively
- To improve exploitation and dissemination of the research results

Essential early achievements have already been obtained in several *LUTR* projects like:

- Helping cities to define their own objective of sustainability.** It is commonly agreed that “sustainability” has different meanings depending on the socio-economic context. Cities often need support to translate the “theoretical and internationally adopted” concept of sustainability into concrete actions to be taken.
- Reviewing scenarios and policies used by cities to define their management & planning strategies.** It is important to understand which types of long-term scenarios, policies and policy mixes are used to develop a strategy in European cities. The project PROSPECTS has catalogued a list of almost 80 types of policy instrument. Furthermore, preferred ways has been identified, in which these instruments might be combined. Regarding that, a great diversity of approaches seems to exist, e.g. a vision-based approach; a citizen-based approach and a technocratic approach based on planning and modelling.
- Assessing the key determinants in city decision-making processes.** The critical elements of decision-making processes of cities were analysed in detail, such as sole and shared responsibilities, or consultation requirements and influences. Moreover, the technical, financial and political barriers to strategy implementation were identified.

So far, *LUTR* activities have essentially concentrated on a better understanding of the way cities effectively defining and implementing their urban mobility strategies. Next steps will address the benchmarking of these strategies to derive “best practices” and to construct improved decision support tools. Therefore the accompanying measure *Achieving Sustainability in TRAnsport and Land Use (ASTRAL)* was designed.

2.1 ASTRAL

Full name: Achieving Sustainability in **TRAnsport and Land Use**

Project duration: 2001/06/01 - 2003/08/31

Objectives:

ASTRAL is designed as an Accompanying Measure. That means, it will not conduct new research but increase the value of *LUTR* activities by assisting cities, national governments, international and non-governmental organisations, interest groups and individuals in obtaining maximum benefit from research undertaken by *LUTR* projects.

This objective will be achieved through:

- Encouraging interaction between the *LUTR* projects, and thus enhancing the synergy between them
- Developing a Europe-wide network of related national and regional projects in the same field, and hence encouraging collaboration with them
- Dissemination of these preliminary results to a wider audience, and advice on future research plans
- Producing and maintaining an interactive web-site for use by researchers as well as end users (governments, cities, citizens)
- Enabling end users to identify the best means of achieving dissemination and take-up of these research results, and subsequently disseminating the results of EU research in these ways

Expected results:

Different workshops will be organised throughout Europe in the coming months and years and substantial resources will be spent on dissemination. The interactive web-site will encourage take-up of *LUTR* projects and other related projects' recommendations.

European cities will be the prime beneficiaries of these actions as they will have soon at their disposal a new range of tools and approaches that will allow them to optimise their policy mix in favour of sustainable mobility. Furthermore, ASTRAL is helping to focus the research community's interest on the key topic of land use and transport planning.

Homepage: <http://www.ess.co.at/LUTR>

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3. PROJECTS WITHIN LUTR

PROSPECTS

Full name: Procedures for **Recommending Optimal Sustainable Planning of European City Transport Systems**

Project duration: 2000/02/01 - 2003/01/31

Objectives:

The principal objective of PROSPECTS is to provide cities with guidance needed to generate optimal land use and transport strategies to meet the challenge of sustainability in their particular circumstances.

The sub-objectives, each of which is associated with a separate technical Work Package, are:

- To identify the decision making needs of cities
- To assess and enhance evaluation tools to aid decision making
- To assess and enhance forecasting and analysis tools for the land use/transport system
- To publish a Decision-Makers' Guidebook and supporting Methodological and Policy Guidebooks
- To disseminate the results and exploit the three Guidebooks and the enhanced tools

Policy objectives, underlying trends and future scenarios, policy options, decision making processes and barriers to implementation are identified initially within the Core Cities (Edinburgh, Helsinki, Madrid, Oslo, Stockholm and Vienna).

Expected results:

The principal outputs are three Guidebooks which are designed for ease of use by city authorities and by the public in their cities. The advice will enable them to enhance sustainability, the environment, social inclusion and quality of life through the design of more effective land use and transport strategies.

- Decision-Makers' Guidebook is designed for politicians, senior officials and the public, and outlining the approach to decision making, the policy options, and the support tools available.
- Methodological Guidebook is designed for professionals, and provides more extensive advice on the support tools for evaluation, forecasting and analysis.
- Policy Guidebook describes current experience with the full range of policy options, and is of interest to politicians, professionals and the public.

Homepage: <http://www-ivv.tuwien.ac.at/projects/prospects.html>

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TRANSPLUS

Full name: **TRANS**port Planning, Land Use and Sustainability

Project duration: 2000/04/01 - 2003/03/31

Objectives:

The aim of TRANSPLUS is to identify best practices in the organisation of land use and transport measures in order to **reduce car dependency** in European cities and regions and to **promote economic, social and environmental improvement**. The research process is organised as follows:

- System analysis of megatrends in urban development and strategic approaches towards sustainable transport
- Assessment of integrated land use and transport strategies
- Assessment of implementation strategies
- Analysis of barriers, potential solutions and their transferability
- Analysis of different methodologies to promote citizens, stakeholders and users participation to the different phases of policy planning and implementation
- Networking and dissemination activities to provide results to a broader audience

Expected results:

- Dissemination of best practises of land use and transport planning through TRANSPLUS web-site and database
- Guidelines of assessment methodologies for land use and transport policy integration
- Tool for a policy transferability check

The impacts listed above represent an overall improvement in the capacity to understand the viability of integrated solutions and their potential benefits in different frame conditions. But the success of any integrated solution depends on its practical application. This will be mainly reached through networking activities that ultimately will reach a significant number of local decision makers.

Homepage: <http://www.transplus.net>

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PROMPT

Full name: New Means to **PROM**ote Pedestrian Traffic in Cities

Project duration: 2000/03/01 - 2003/02/28

Objectives:

The main goal of PROMPT is to promote non-motorised transport in cities with particular focus on pedestrian traffic. Its concrete objective is to develop new innovative tools and generic solutions for city actors involved in urban planning and design as well as in decision making. The working programme consists of the:

- Analysis of causes enhancing or hindering walking in several case cities by focussing more on suburbs than on city centres
- Identification of different user groups and their behaviour, climatic conditions, cultural differences as well as differences in city structures
- Evaluation of strategies and experiences of implementation of various measures to promote walking according to different topics, e.g. safety, accessibility, comfort, attractiveness, intermodality etc.
- Development of multidisciplinary tools to find comprehensive solutions for identified problems

Expected results:

The planners', designers' and decision makers' knowledge about how to promote walking in practice is being considerably improved through the:

- Identification of best practices
- Development of new tools and generic solutions for problem identification, problem solving and implementation of proper measures
- Dissemination of the results for various end-users

The main benefits will be the decrease of harmful impacts on the environment as well as the improvement of the accessibility to public space, the health of citizens and their equality regardless of car ownership, health or disability. The main beneficiaries will be citizens themselves as well as the city authorities.

Homepage: <http://www.vtt.fi/virtual/prompt/>

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PROPOLIS

Full name: Planning and Research Of POLicies for Land Use and Transport for Increasing Sustainability

Project duration: 2000/01/01 - 2002/08/31

Objectives:

The objectives of PROPOLIS are to investigate, 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:

- An integrated and comprehensive approach
- A common framework for analysis with different land use and transport models
- A combination of strategic interactive land use and transport models and GIS techniques
- An analysis of feedback from the attributes of environmental quality to the locating process of households and firms is part of the innovation
- A usage of a decision support tool consisting of aggregate environmental, social and economic indices for alternative policy options

PROPOLIS approach is used to analyse systematically policy options in 7 European cities to derive recommendations for optimum combinations of different policy types.

Expected results:

- General conclusions and recommendations for European urban regions
- A set of well-defined indicators to measure environmental, social and economic components of sustainability
- Updated and enhanced urban models and evaluation systems suited for environmental impact assessment

PROPOLIS strategies will lead the way to better environment, land use patterns, transport systems, economy and social conditions for European citizens - towards sustainable development.

Homepage: <http://www.ltcon.fi/propolis/index.htm>

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SUTRA

Full name: Sustainable Urban TRAnsport

Project duration: 2000/07/01 - 2002/12/31

Objectives:

The primary aim of SUTRA is to develop a consistent and comprehensive approach and planning methodology for the analysis of urban transportation problems, that helps to design strategies for sustainable cities.

From a technical perspective, the project aims to develop and apply an indicator based approach which is to be achieved by the:

- Use of traffic equilibrium models to evaluate alternative transportation policies
- Translation of transportation scenarios and their resultant emissions into ambient air quality estimates and population exposure using air quality modelling
- Environmental impact assessment using a rule-based checklist approach including the complete life cycle of transport systems
- Identification and evaluation of cost effective transportation scenarios by means of an economic and energetic system analysis
- Definition of long-term (30 year horizon) development scenarios for each case study city

Expected results:

- Solutions for sustainable transportation leading to an improvement of quality of life in urban communities and associated urban regions, and thus competitiveness of European cities
- Planning and decision support tools designed for direct use by city administrations
- Public information system on Internet to support citizens' and stakeholders' participation in urban decision making processes

SUTRA research should contribute to the improvement of quality of urban life, health and safety towards sustainable, attractive and enjoyable cities.

Homepage: <http://www.ess.co.at/SUTRA/>

Contact: Dr. Kurt Fedra; Environmental Software & Services GmbH (ESS); PO Box 100; Kalkwerk 1; 2352 Gumpoldskirchen, Austria; kurt@ess.co.at

ISHTAR

Full name: Integrated Software for **H**Health, **T**Transport Efficiency and **A**Artistic Heritage **R**Recovery

Project duration: 2001/06/01 - 2004/05/31

Objectives:

The goal of ISHTAR (Integrated Software for **H**Health, **T**Transport Efficiency and **A**Artistic Heritage **R**Recovery) is to build an advanced software suite to analyse effects of short term actions and long term policies aiming to improve quality of environment, citizens' health and conservation of monuments.

Steps of development are:

- Integration of a large number of software tools and the creation of specific modules for advanced simulation of key processes such as transport behaviour and its direct impacts on the urban environment
- Creation of a new method and an innovative software tool for assessing urban policies
- Evaluation of policies effects on citizens behaviour using an integrated 24hr simulation of traffic emissions, noise and safety
- Microscopic analysis of air pollution effects on health and monuments.
- Analysis of measures implemented in seven involved cities: Athens, Bologna, Brussels, Graz, Grenoble, Paris and Rome
- Dissemination and exploitation of results

Expected results:

The key result of ISHTAR Project will be the realisation of a multi-impacts models suite for the assessment of a wide menu of measures for urban life quality. The models suite will be an innovative tool for advanced urban management and will allow integrated analysis of various environmental effects of technical and non-technical measures. In future, ISHTAR suite will allow public administrations and consultant companies to run integrated and advanced environmental assessment of short-term actions and long-term policies.

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ARTISTS

Full name: **ARTer**Ial Street Towards Sustainability

Project duration: likely 2001/11/01 - 2004/10/31

Objectives:

ARTISTS aims at improving decision-making regarding the re-construction of arterial streets, taking into account a broad set of social, economic and environmental factors. This encourages city administrations to chose more innovative and sustainable solutions when re-designing arterial streets.

The project work consists of the:

- Elaboration of a practical method, which facilitates access to new knowledge and motivates to change view points
- Development of a method for functional classification of arterial streets
- Use of tools enabling city administrations to "benchmark" streets in a holistic approach based on a few core factors
- Analysis of the current state of 38 arterial streets and examination of short- and long-term effects of different re-constructions, street designs and management strategies
- Identification of barriers and possibilities to design sustainable arterial streets

Expected results:

- Innovative tools providing new alternative options for problematic arterial streets and discussing effects of new designs in an understandable manner
- Best Practice Guidelines for redesigning arterial streets
- Dissemination of knowledge through a web- site and a brochure
- Seminars and workshops with local, regional and national decision makers and experts

Contact: Mr. Åse Svensson; Lund University; Traffic Engineering, Dep. of Technology and Society; P.O.Box 118; 22100 Lund, Sweden; ase.svensson@tft.lth.se

CITY FREIGHT

Full name: CITY FREIGHT

Project duration: likely 2001/11/01 - 2004/01/31

Objectives:

The main goal of this project is the identification of innovations in freight transport that could contribute to a more sustainable development in European cities. Within this project, the socio-economic and environmental impacts of changes in freight transport and door-to-door delivery in a variety of European conurbations will be analysed in a systematic and innovative way. Therefore CITY FREIGHT will acquire an analysis of some selected supply chains that are already functioning in Europe and evaluate their impacts in an urban context with the help of a common assessment methodology. The working process of CITY FREIGHT consists of following tasks:

- To identify innovative and promising logistic schemes
- To set up a list of criteria and a common assessment method to evaluate those logistic schemes and related accompanying policies (e.g. legal framework, land use planning, road traffic regulation, pricing, etc.)
- To analyse their internal technical, economical and environmental efficiency
- To design implementation scenarios of these schemes and related accompanying policies
- To assess and optimise the scenarios according to criteria of a sustainable development
- To disseminate and exploit Best Practice Guidelines for the design of concrete implementation plans of integrated strategies

Expected results:

The main results are Best Practise Guidelines which provide guidance to interested stakeholders (national, regional or local authorities, network operators, shippers and consignees) for analysing their city freight problems as well as for designing and implementing of integrated strategies. Public administration is becoming more aware of the importance and diversity of the factors of urban freight traffic. In past, actions were mainly limited in controlling and restricting road traffic. At present, there exist significantly more areas of interest, such as economic efficiency, spatial planning, land use management and environmental protection.

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ECOCITY

Full name: Urban Development towards Appropriate Structures for Sustainable Transport

Project duration: likely 2001/12/01 - 2004/11/31

Objectives:

ECOCITY research focusses on the development of settlement patterns for sustainable cities emphasising implications for an environmentally compatible transport system. The improvement of urban environments implies to support a polycentric, balanced urban system and to promote resource-efficient settlement patterns, that minimise land-take and urban sprawl.

The work programme consists of the:

- Integration and implementation of specific, often already tested individual solutions

- Creation of scenarios in experts round tables which consist of solutions which integrate sustainability in all sectors and include multiple cross-sector interrelations
- Identification of strategies to design a space and energy saving settlement structure which take into account the requirements of sustainable transport (convenience for pedestrians, efficient public transport and goods' distribution logistics) as well as energy efficiency, environmental quality and the utilisation of alternative sources of energy
- Demonstration of the feasibility and desirability of future urban living compatible with sustainability requirements

Expected results:

The approach of ECOCITY is to develop:

- A common concept including model settlements in six participating countries
- General guidelines for planning

These products, which should be properly disseminated, will have a substantial impact on the growing community of urban planners interested in an improvement of current planning practices.

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SCATTER

Full name: SCATTER

Project duration: likely 2001/11/01 - 2004/08/31

Objectives:

The main task of SCATTER is to study causes and consequences of urban sprawl in order to design and to assess the efficiency of measures aiming to prevent, mitigate or control this trend that threatens most of the European cities.

The stages of the work are:

- State-of-the-art review of urban sprawl impacts and urban sprawl measurement techniques
- Systemic analysis of urban sprawl on basis of expert interviews, in 6 case cities: Brussels, Stuttgart, Bristol, Helsinki, Rennes and Milan
- Statistical analysis of urban sprawl impacts (population and jobs location, trip demand pattern, air pollution) in 6 case cities
- Review and of measures aiming to wrestle with urban sprawl with a special focus on US cities
- Quantitative evaluation of accompanying measures to implementation of suburban public transport using integrated land use/ transport models
- Set-up a group of end users (cities) and organize 2 workshops to involve them in the research

Expected results:

The key output of SCATTER will be:

- A document setting up recommendations about accompanying measures to the implementation of suburban public transport aimed to prevent, mitigate or control urban sprawl, in order to meet the needs of a sustainable urban development
- An "urban sprawl monitoring tool" addressed to local authorities
- The application of research outcomes to elaborate practical programmes of measures for the 6 case cities

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4. CONCLUSION

Present land use and transport planning activities are recognized as a serious issue for future development. The high amount of research resources underlines their importance. The past application of End-of-pipe technologies reduced the perceptible negative impacts but enabled unwanted developments and limitless growth. However, proper frameworks to achieve trend changes - from urban sprawl towards dense settlements - form sustainable solutions. The results of LUTR projects represent a first imagination how these frameworks should look like.

To cope with complex issues complex methods must be applied. Within the projects a number of methods are developed and/or used. Also several objectives have to be met and a lot of stakeholder interests have to be taken in consideration.

The following table summarizes common issues of the introduced *LUTR* projects. It will provide information about the scale of the approach, which problems are addressed, which methods are used and which main results are obtained.

		PROSPECTS	SUTRA	PROPOLIS	PROMPT	TRANSPLUS	ISHTAR	CITY FREIGHT	SCATTER	ECO-CITY	ARTISTS
Scale of the approach	Time horizon (years)	Up to 30 years	10-30	25-30	Short to long term.	Short, medium, long term	Short and long term	10-30 years	10-30 years	Short to long term	Short and long term
	Spatial scale	25,000 < inhabitants	Urban/regional	Urban regions to neighbourhood	Street level to urban level	Urban region to neighbourhood	Regional	Urban regions	Urban regions	Neighbourhoods to urban regions	Arterial streets
	Transport modes	All	All	All	Walking (integration with other modes)	All	All	All	All	Walking, cycling, public transport	All
Problems Addressed	Urban Environment	X	X	X	X	X	X	X	X	X	X
	Urban economy	X	0	X	0	0	X	X	X	X	0
	Social urban development		X	X	X	0	X	X	X	X	X
	Urban design				X	X		X	X	X	X
	Decision-making	X	X	X	X	X	X	X	X	0	X
	Citizen's participation	X	X	X	X	X	X			X	X
	Barriers	X			X	X		X	X	0	X
	Energy Systems	X	X	X	X	X					
Health		X	X			X			0	X	
Methods Used	Modelling	X	X	X		0	X	X	X		X
	Forecasting	X	X	X	0	0	X	X	X		X
	Monitoring		X		0	0	X		X		X
	Interviews, Questionnaires	X			X		X	X	X		X
	Design ideation				X					X	X
	Case City Analysis	X	X	X	X	X	X	X	X	X	X
	Indicators	X		0	X	X	X	X	X	X	X
	Decision Support Tools	X	X	X	X	X	X	X	X	X	X
	Policy compatibility and transferability analysis	X	X	X	X	X	X	X	X		X
	Scenarios	X	X	X				X	X	X	X
	Optimisation	X	X	X				X	X	X	X
Expert systems		X									
Main Results	Policy recommendations	X	X	X	X	X	X	X	X	X	X
	Benchmarking values		X	X					X		X
	Tools/methods	X		X	X			X		X	X
	Best practices assessment/data base	X			X	X		X	X	X	X
	Guidebooks	X			X			X	X	X	X
	Public information web server		X					X		X	X
LEGEND:		X ... indicates coverage				0 ... indicates partial coverage					

Table 1: Project summary

We hope the here presented information will help interested researchers, decision makers and planners to get knowledge how to initiate processes towards sustainable developments which results in a worth living world for our children.

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