

- desires for closer ties with nature,
- new level of consciousness, namely, that physical space and natural resources are limited commodities.

As late as the last three decades, new needs and views concerning necessary changes and sustainable lifestyles have been formulated. Even new technologies blossomed to the necessary level enabling changes in work patterns. We are of course at the beginning of a long period of transforming urban, suburban and rural space.

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Pictures

Picture 1: *Chrystal Waters (Australia): layout of the centre and views (source: Context Institute 1994; 32, 33)*

Picture 2: *Cerro Gordo (Oregon, USA): surfaces near the Lake Dorena (source: Context Institute 1994; 35, 36)*

Picture 3: *Example of the Danish cohousing movement, representing several communities with differing settlement design and architecture. These are responsive to the mentioned sustainable principles, but also active and passive use of solar energy, subterranean storage of heat, reuse of water, compost toilettes etc. Nearby is a wind driven electric power plant – Halsuaes peninsula (source: Context Institute 1994, 46, 47, 50).*

Picture 4: *Centre Aztlan, Querétaro, Mexico, where solar and wind energy are also exploited (source: Context Institute 1994; 61,62)*

Picture 5: *Examples of communities: High Wind, Plymouth (left) and Ganass, New York (right) (source: Context Institute 1994; 68, 69, 107)*

Picture 6: *New neighbourhood Ballerup, North-west of Copenhagen (source: Hartoft-Nielsen 1995; 58, 59)*

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Aljaž PLEVNIK

Legal measures for achieving sustainable traffic in European cities¹

1. Introduction

Legal measures play an important role in achieving sustainable traffic in European cities. These measures substantially co-create the traffic system by alleviating traffic, choice of traffic modes, managing traffic flows etc., thus diminishing their environmental effects. Despite their utmost importance, these measures are effective, if they are a part of comprehensive traffic concepts.

The article presents results of the research project LEDA(2), financed by the General directorate for traffic with the European commission, within the framework of the 4th general programme of research and technological activities of the European Union (in continuation EU). 15 partners from 9 EU member states and 5 accession states took part in the project. The project was co-ordinated by the Regional institute for regional and urban development in Dortmund; Slovenia participated with a team from the Urban Planning Institute.

The aim of the project was to research those legal measures on the European level, that are suitable for redirecting traffic demand to benefit public traffic and non-motorised urban traffic. The focus of the project was directed into research of whether and under what conditions, particular measures can be transferred to countries with a different legal system. A part of the research was a comparative study of best measures Europe wide, distinguishing the LEDA project from others with similar topics. The goal of the project was also to help decision-makers on the local level in designing traffic systems.

The article starts with the starting points, i.e. the basis for the research concept. Methodology and results of the project follow them. In conclusion the main findings of the research are presented, as well as their relevance.

2. Starting points of the project

The enormous growth of passenger and freight traffic in most European countries is causing numerous problems. These are most dramatic in cities and their hinterland: congestion, accidents, pollution, consumption of energy and space, changed settlement pattern, loss of urbanity etc. Redistributing traffic modes from predominantly private motor vehicles to public transport and non-motorised modes, is the most common method of solving the problems. In European cities promotion of sustainable traffic modes is implemented in different ways and on different levels, based on different rationale and, above all, different measures:

- education and information measures focusing on establishing public consciousness about present problems with promotion of using public transport and non-motorised traffic modes;
- measures in infrastructure involve proposed construction that strengthen the role of sustainable traffic modes in new development, as well as changes in present infrastructure;
- a wide palette is offered by financial measures, reaching from parking prices to road tolls and various taxes etc.;
- legal measures applying to the concrete legal order, above all adoption of new laws and amending old ones, as well as other bylaws and legal norms;

The LEDA project is focused on the last group of measures and is therefore different from all previous projects dealing with similar issues, but seldom tackled their legal aspects. The legal aspect of measures is nevertheless extremely important and can have a decisive role in the long-term success of particular projects.

Although the project dealt only with legal measures, other measures that have a strong legal component were also included in the research. Segregating a separate lane for buses is a typical example of infrastructure measures, but because of division of the available road corridor and limited

access to other vehicles, it is a legal measure as well. Rules of using such a lane differ between countries and cities – in certain places usage by other vehicles is allowed during rush hours, while in others the list of possible users is longer (e.g. taxis, cyclists, public car users etc.).

The project mainly relies on the traffic sector, however it also deals with adjacent disciplines (urbanism, environmental protection, and energy supply), that have mutual relationships with the traffic system. The review of related disciplines prevented the possibility of ignoring any of the interesting and less known, but relevant measures.

3. Methodology

The project was divided into several of partial, meaningfully conclusive topics, named »work packages« (in continuation WP), following each other in a logical series.

3.1 WP 1

Review of traffic policy goals and legal frameworks of selected countries

The first step of WP1 included a review of those parts of documents related to traffic policy applied to traffic in urban areas, physical planning and environmental protection. 74 documents from 14 countries were reviewed and analysed. The source of the documents conditioned the differences in the level of detail. Documents from countries participating in the work group were analysed in detail.

Based on the review of the mentioned documents a comparative analysis of results was carried out, the intention being the establishment of possible conflicts or similarities between policy goals on the national, regional and even European level. The common denominator of the reviewed documents was that they placed substantial emphasis on urban traffic. The findings of WP1 enabled the establishment of evaluation criteria for reviewing legal measures in the other steps of the project.

The second step of WP1 was reviewing legal frameworks and jurisdiction and the level of decision making in all the involved countries. The main questions raised in the analysis were, At which administrative level are decisions taken and particular measures implemented, that support sustainable mobility, and, What can municipal authorities do by themselves, with which procedures within the present legal and administrative framework. The analysis was conducted in 20 European countries with different levels of detail, adequate to the country participating in the project.

Formulating the review was made possible by the obtained information, whereby similarities and differences between national and regional legal frameworks in the field of urban traffic, physical planning and environmental protection policies. Simultaneously the first proposals for changes to certain legal frameworks at the local level were drafted.

3.2 WP 2

Regional user groups (RUG)

The project success was closely tied to the co-operation of local actors. Thus four regional groups were formed. Their members monitored the project, suggested the choice of ci-

ties and measures, ensured feed-back information to the research group and within the scope of their jurisdiction, commented the planned phases of the project. Regional groups were formed from representatives of local authorities, various organisations and other interested groups. According to the regional key, they were divided into four regional groups:

- Scandinavian countries;
- Countries in North-western Europe;
- Mediterranean countries;
- Central European countries and accession states.

3.3 WP 3

Inventory of present legal measures

Based on the results of WP1 an inventory of relevant legal measures supporting sustainable traffic development in European cities was prepared. To avoid redundancy with other research, running parallel to the project, and to supplement the present level of knowledge about the issue, at first, all comparable and available European projects were reviewed.

Later 41 selected European cities were analysed in detail, giving a clearer picture of the conditions at hand. In accordance with the project goals the research didn't include only legal measures, but also education, information, infrastructure and financial measures, but only if they contained legal components. Information on the characteristics of cities was also collected, giving an insight about urban circumstances. All the gathered information was grouped into a specially prepared LEDA database. Precise instructions ensured comparison of gathered data, therefore the data base offers reliable and useful information about possibilities for transferring effective measures between countries and cities.

217 measures were collected and analysed. To ensure suitable comparison, a table was prepared, containing information on the place and scope of particular implemented measures. The table also provided added information used as the basis for choosing 20 measures that were dealt with in detail in WP4.

3.4 WP 4

Detailed research of less known legal measures

In WP 4 20 less known, but successful, legal measures were researched in detail. Based on WP3 the criteria for selecting cities and measures were defined:

- knowledge about a measure;
- differences in implementing the measure in Europe;
- ensuring the availability of researched measures Europe wide.

Besides the information from the previous WP, additional information needed for detailed research was gathered, including data on participating actors, public circumstances leading to the adoption of a restrictive measure, important parallel measures, obstacles and results of implementing a particular measure.

3.5 WP 5

Study on possibilities for transferring measures

Based on the twenty measures, researched in detail in the previous package, a study of possible transferability into other cities was carried out. The intention was to prepare gui-

delines for local actors on how to implement the transfer of measures and how to avoid known obstacles, which could hinder the transfer. Instructions on evaluation of transferability of measures were prepared beforehand, thus enabling comparisons between results of the whole research.

The core of the study on transferability was simulation of a transferred measure. Cities were divided into two groups – source and target cities. Source cities were those where one of the twenty measures was already introduced, while target cities were those into which a measure could possibly be transferred.

The studies were carried out in workshops with local experts. The goal of the workshops was to evaluate the transferability of measures, according to a city's characteristics. The achieved value could help municipal representatives to transfer a measure in the future. Transferability was evaluated with simulated exercises in the form of a matrix. The procedure was carried out in fifteen target cities and in each the transfer of five of the twenty measures was simulated. Transfer was simulated in several steps of decision making, where the importance of all particular aspects was tested, such as municipal strategic directions, legal framework of municipal operation, political framework of the city, public sympathy and issues concerning implementation and control.

The target groups for results from this package were therefore local experts, as well as representatives of regional and national government. They latter would gain directions on how to support local authorities when introducing the defined measures.

3.6 WP 6

Dissemination of results

The last of the work packages was intended for the ensuring of optimal presentation and promotion of the projects' results. An informative brochure was published, a project web page and a manual on best practices with information concerning transferability of results. An international conference was organised in Dortmund in June 1999, parallel to a series of activities transferring the project results into practice.

4. Results

4.1 Review of goals of traffic policies and legal frameworks in the particular countries

The review involved a substantial selection of documents concerning traffic, spatial and environmental policies – from strategies to particular laws and by-laws. It also involved various government tiers – from local to European. Most of the strategic documents applied to the national level, while the documents on the local level were more specific and less programme oriented, but with more and stricter regulatory measures. Although their orientation was narrowed down to particular issues, they also included broader criteria of sustainability.

Documents produced by the European Commission mainly provide general frameworks, point out particular strategies and establish guidelines for further discussion. The are not legally binding, but most of them will probably at later sta-

ges be included in European legislature. Most European documents focus on transport, but in close ties with spatial, environmental and social policies. The committee is acutely aware of inter-sector influences of modern transport systems. The common issue in the reviewed European documents is support for sustainable mobility.

According to the reviewed documents it is possible to judge that the European commission and authors of transport policies in most European countries are largely aware of increasing problems, caused by environmental, social, spatial and economic affects of traffic. Promoting sustainable development of traffic isn't envisioned as contrary to other EU goals, but implies the balanced enforcement and development of the common market with support to competitiveness and economic growth.

4.2 Review of legal starting points in the particular countries

Traffic policies on the national, regional and local levels should be formally aligned and consistent. The detailed review however shows, that tight co-operation between particular levels in the field are extremely rare. Most traffic policies don't have an integral approach, they lack the multi-modal aspect and deal with traffic through sectors.

The conditions in EU accession countries are especially harsh. There the level of growth of individual motor vehicle traffic is often higher than in member states, there the formerly well developed system of public transport is continuously diminishing.

A special and vital problem for urban areas is the underdeveloped planning of regional traffic and comprehensive planning of the traffic system on the regional level. Because of weak regional government in numerous countries the problem is being alleviated by municipal co-operation. These informal regional unions are often established to solve traffic problems. The key for successful operation of these unions is the quantity of available resources collected, the condition for effective execution of adopted policies.

4.3 Inventory of present legal measures

The selection and analysis of 217 legal measures from 42 European cities show differences between municipal traffic policies concerning legal measures. Municipal traffic policies are in fact quite similar, but detailed analysis points out important specific conditions needed for the success of particular measures.

The collected data in the wider selection of measures was the foundation for designing the database. The LEDA database is intended for experts on municipal traffic, as well as local, regional and national governments. It is available in digital form on demand or on the project's web page. It contains legal measures from 41 European cities, represented on the map.

The LEDA database contains collected information on all the involved cities and data on all reviewed measures. In the municipal part of the database provides users with statistical data about the city, data on characteristics of its traffic system, mu-

municipal administration structure and spatial, environmental circumstances. Measures couldn't be dealt with independently from the city's characteristics and traffic, political framework, through which particular measures were implemented. Knowledge about background circumstances is essential in evaluation of measures and enables the understanding of the process behind their implementation. Understanding the connection between measures and methods, place and reasons for their enforcement is essential in establishing possibilities for their transfer between particular cities, but also countries.

The selection of measures has a wide conceptual palette, but they can be joined into the following groups:

- measures tied to organising traffic: concessions for parking, traffic co-ordination, car-sharing groups etc.;
- measures for the management of ownership of vehicles: taxi licenses etc.;
- measures, tied to physical management of parking: introducing parking places, electronic guidance to vacant parking places etc.;
- measures tied to traffic signals for parking;
- measures tied with land use: urban planning measures can directly or indirectly affect the use of particular traffic modes;
- measures tied to environmental issues: these measures can directly affect urban traffic, for example by introducing environmental zones, noise thresholds, controlling polluting vehicles etc.;
- measures that administratively manage traffic: permit system etc.;
- measures of physical management of traffic: locations of traffic lights, redesign of streets, curtailing streets for transit traffic with various obstacles etc.;
- measures affecting general traffic signs: control of road traffic is one of the most important fields in legal measures, while the conjunct traffic signs are the basic tool for establishing bus lanes, systems for directing parking, cycle paths and networks etc.

5. Detailed research of less known measures

Participants in the project, representatives of the European commission and numerous other experts, working in the four regional user groups chose 20 less known, but effective measures, researched in detail in the later phases of the project. In general the selected measures differ only in the level of integration into other, broader traffic management concepts (e.g. joined lanes for cyclists and buses in Ghent), relative independence of implementation or possibility of dividing a measure into further sub-measures (e.g. the parking policy in Luxembourg). The chosen measures can be grouped into the following categories:

A. Managing accessibility

- increasing accessibility in Lisbon (Portugal);
- limiting access to the centre of Erfurt (Germany);
- city road tolls in Oslo (Norway);
- traffic calming in Bologna (Italy);
- environment zones in Lund (Sweden).

B. Managing parking:

- parking policy in Evora (Portugal);
- comprehensive parking policy in Luxembourg;
- parking system in Ghent (Belgium);
- parking for public cars in Wiener Neustadt (Austria).

C. Public transport:

- ensuring priority for buses in Budapest (Hungary);
- bus corridors in Dublin (Ireland);
- two-way bus lanes in Zug (Switzerland);
- joined lane for cyclists and buses in Ghent (Belgium);
- taxis for people in wheelchairs in Edinburgh (Scotland, UK);
- traffic taxation of companies in Strassbourg (France)

D. Pedestrian and bicycle traffic:

- cycling road in Lemg (Germany);
- areas reserved for pedestrians in Copenhagen (Denmark).

E. Physical planning and environment:

- ABC location policy in the Hague (Netherlands);
- location policy for business activities in the Hague (Netherlands);
- measures for achieving air quality in Lyon (France).

The common feature of the selected cases is that most were intended for solving traffic problems. This is especially important in city centres, where accessibility, quality of life and sustainable traffic modes are essential questions in managing mobility. Simultaneously this means that the interest of the public living in cities should be given priority before daily migrants, shoppers or visitors and that in new urban areas the demands of all users have to be respected and balanced. From the selected cases, we can discern the trend in solving such development: the first group represents direct measures on vehicles and infrastructure, while the second group involves the introduction of comprehensive policies for controlling those elements causing traffic problems. Most measures belong to the first group, a result of the desire to solve local problems expediently (affecting e.g. parking, public transport or limiting access for cars). In general, both groups demand equal implementation procedures (although at different levels), equal integration of municipalities and above all, equal level of consciousness and acceptance of the problem by the public.

The next important common property of selected measures is their indivisible connection with present comprehensive transport policies. All the twenty selected measures are specific examples of comprehensive approaches to management of urban problems that are based on the integration of particular traffic modes and quest for new, sustainable forms of living. Most of the selected cases aim at diminishing motorised traffic and expected positive results in the environment.

An interesting fact is that most of the selected measures were introduced just recently. Simultaneously this means that measuring their effectiveness is an ongoing process, thus it is still unclear, whether the measure will meet all expectations. Nevertheless possibilities for controlling efficiency is an important novelty, that until recently hasn't been included in the introduction of new measures. Based on the experience of twenty measures one can therefore conclude, that managing mobility has advanced significantly, in the sense of controlling problems and learning on ones previous mistakes.

5.1 Transferring measures

Amongst all the research chapters the last one confronted the largest number of problems. The chosen approach and used analyses didn't confirm the hypothesis, that possibilities for transferring measures can be predicted by analysing particu-

lar characteristics of source and target cities. The basic problem was the used method. The size of the sample and chosen statistical method in fact couldn't guarantee significant differences between cities. The consequence was the inability to distinguish co-relations between researched elements.

Nevertheless, the results of the research chapter don't mean that the whole project approach, i.e. establishing guidelines for choosing and transferring measures between cities, was impossible. The results show that municipal traffic experts are in the best position to choose measures for their cities, because of their knowledge on local political conditions and public sympathy. Therefore they have to be given access to high quality information on present measures in a structured form. The latter is enabled by the established LEDA database, representing an important European instrument for traffic experts, thus fulfilling the goals of the project.

The chapter and the results of the workshops facilitated the participants in the project with access to different practical information on possibilities and problems for transferring measures between cities. The common denominator of most researched target cities is that those measures, tied to stimulating public transport, cycling and pedestrian traffic, can be transferred relatively easily. On the contrary, measures tied to limiting the use of private cars, are confronted with much more obstacles, especially political opposition and poor reception from the public. The latter is much less pronounced in cities that have a lower level of motorisation, i.e. cities in EU accession countries.

Simulation of transferring the selected measures into target cities pointed out numerous possible obstacles, tied to municipal strategic goals, political climate, public opposition and issues on control. Clearly all obstacles cannot be removed. Much depends on the dedication of participants in the project, public participation and urban structure.

6. Conclusion

The results of the project help in understanding the conditions needed to succeed with the measures for achieving sustainable traffic development in cities. They also point out the often used measures, as well as those that are not so well known. Possibilities for transferring measures between cities and countries were also made clear.

An extremely useful result of the project is the database with more than 200 legal measures and their detailed description, available on the project's web page or on demand in digital form.

An important conclusion is in the recognition that local authorities have immense freedom in execution of activities tied to the traffic system. The result is not surprising, but it does have significant consequences in achieving sustainable traffic in cities. Relatively broad jurisdiction of local authorities enable them to begin implementing adequate measures immediately, especially parking management, traffic calming, public transport, cycling and pedestrian traffic, without delays caused by changes brought about on upper governmental tiers.

The wide overview of European circumstances in the field of traffic allowed the participants in the LEDA project to formulate additional suggestions for local experts. Success of a

particular measure is tied to its role in a comprehensive municipal traffic policy that can ensure mutual support and translations between the measures. In cities that are significantly lagging behind comparable European cities, it would be sensible to use the »best practices« approach when introducing a new measure or to utilise the available knowledge and experience from other cities. Thus cities are strongly advised, to use all of their jurisdiction and potentials and co-operate with other cities in the European context and exchange experiences and knowledge. A very operational tool for such exchange is the ELTIS initiative established by the European commission. Complementary support will be given by the methodology for transferring measures, developed by the LEDA project, that supports the joint and structured approach for the wider utility of locally developed measures.

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Notes

- 1 The article was previously presented at the 5th Slovenian congress on roads and traffic, Bled, 25th October 2000.
- 2 LEDA = Legal and Regulatory Measures for Sustainable Transport in Cities
- 3 RUG = Regional User Groups

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Živa DEU

The visual image of prefabricated houses and new directions in the urban and architectural development of settlements

1. Introduction – the quality of present living conditions

Natural and cultural landscapes, settlements being a part of the latter, change with the development of civilisation. Changes are not always for the better, as illustrated by the present circumstances of our development. In various research's prepared for the Ministry of environment and physical planning and Office for physical planning (responsible for the state of environment and settlements), numerous experts from different fields of expertise pointed out the comprehensive devaluation of the physical environment, expressed not only in the pollution of natural resources, but also the degradation of larger urban structures¹, cultural landscape and space as a whole (Drozg 1996; Fišter 1993; Koželj 1998; Mušič, 1999; Pogačnik 1997; Plut, Ravbar 1995).