

Bridging the gap - the use of methods from research results for implementation of Sustainable Urban Transport Plans – with the example from Lund, Sweden

Christer Ljungberg, Dr Eng, CEO, Trivector Traffic,
Lund, Sweden

1. The concept of sustainable transport systems in Sweden

The discussion of climate change and environmental problems has accelerated during 2006. In Europe the discussion about sustainability has been ongoing since beginning of the nineties. Already in 1996 a cooperation of several Swedish transport authorities and organisations (National Road Administration, The Swedish Association of Local Authorities and Regions, National Board of Housing, Building and Planning, Rail Infrastructure Authority, The Car Industry Cooperation together with the Swedish Environmental Protection Agency), published a series of reports regarding “Environmental Adapted Transport Systems”, in Swedish called MaTs (MiljöAnpassade TransportSystem).

The MaTs concept is built upon The Four Environmental System Conditions of The Natural Step organisation:

- 1) Substances from the Earth’s crust must not systematically increase in the ecosphere
- 2) Substances produced by society must not systematically increase in the ecosphere
- 3) The physical basis for productivity and diversity of nature must not be systematically diminished
- 4) Fair and efficient use of resources with respect to meeting human needs.

In the concept the measures for sustainability are divided into 5 areas:

- 1) Measures influencing the travel need
- 2) Measures influencing modal split and intermodality
- 3) Measure influencing operation of the different transport modes

- 4) Technical measures on vehicles and fuels
- 5) Measures influencing building, operation and maintenance of infrastructure

This concept, MaTs, has been used and discussed in several governmental bills, regarding infrastructure, transport, environment and climate. It has also been recognised and used by a large number of Swedish cities and regions as a concept for how to deal with transport and the environment.

2. Lund – a city with a long tradition on innovative traffic measures

Lund is a medieval university town in the southern part of Sweden. It has 100.000 inhabitants and a long tradition of dealing with traffic in innovative ways.

In 1968 there was a long debate about building a four lane motorway, with a width of 36 meters, right through the medieval city centre. The result was that no motorway was built. Four years later in 1972, the through road through the city centre was closed for car traffic. This road had 21.000 vehicles per day, and has since then been stable on 3000 vehicles per day, where half the numbers are buses and half are courtesy vehicles.

Table 1: *Significant transport policy-making and planning initiatives from an environmental perspective in Lund.*

1969	1972	1985	1999
Municipal Council decision: <i>Abandoning of plans for 4-lane road through city centre</i>	Traffic and Environmental plan: <i>Restriction for private cars in city centre, introduction of parking fees.</i>	Traffic in the inner city of Lund, plan: <i>Pedestrian areas, public transport initiatives, new bus station at railway station, bicycle facilities</i>	LundaMaTs, plan: <i>Ambition to establish an environmentally adapted transport system in Lund</i>

Lund is also well known for its high degree of bicycle use. The modal split for cycling and walking together is 45 %. More than 30% of all trips in the city are done by bike. This is due to a long tradition where a lot of students form the base for a bicycle culture.

Everyday, Lund’s citizens’ cycle around 170.000 km, and 21.000 people visit the city centre by bike. 35.000 people per day change their mode of transport at the Lund central station. A large number of them parks their bike at one of the 3.800 parking facilities and continue the trip by bus or train.

In 1985 there was an investigation made on how to pedestrianize a part of the inner city. More roads were closed to car traffic, and a bigger car free area was created.

In the mid nineties there was a measurement on the benzene content in the air of Lund inner city which showed a very high number. This formed the basis for a decision to make a plan for a more sustainable transport system in Lund.

In March 1997 the city gave the commission to make such a plan to Trivector, a consultancy firm, with close connection to the Lund University.

3. LundaMaTs – the first Swedish SUTP, Sustainable Urban Transport plan

3.1 Layout of the plan

The plan for a sustainable transport system in Lund is called LundaMaTs – short in Swedish for Lund Environmentally Adapted Transport System. The plan concluded of these main parts:

- description of the state of transport and environment
- discussion of vision an goal
- action plan
- description of the effects of the measurements
- plan for monitoring and evaluation

The creation of the LundaMaTs plan took a year to realize. The final report consisted of 300 pages, including more than 100 measures, that were described and whose effects on traffic and environment were calculated.

The organisation of the work can be seen in figure 1.

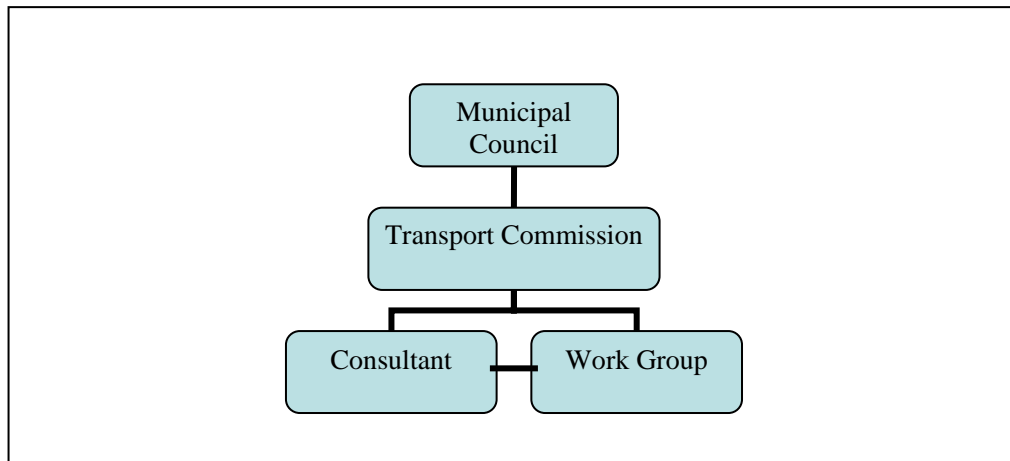


Figure 1: Institutional organisation of the policy-making and planning process leading to LundaMaTs.

The Municipal Council formed a transport commission, with all the important politicians included. The consultant and a work group (consisting of one person from the planning office, one from the environmental delegation and one from the technical department) reported to this commission.

In 2005 the European Commission launched the concept of SUTP – Sustainable Urban Transport Plan. These plans have most characteristics common with LundaMaTs so you can say that LundaMaTs was the first Swedish SUTP.

3.2 Preparing a smooth implementation

One very important part of the outlay of the work the LundaMaTs plan was a discussion of how the implementation of the measures could be secured through a support process based on scientific research results.

A survey over research in this field at that time (1997) did not revealed many results. The main source we chose to focus on was a doctortal thesis by Bent Flyvbjerg, “Rationality and power: *Democracy in Practice*”. The book contains an in-depth case study of how rationality and power shapes urban policy and planning, with the Danish town of Aalborg as a paradigm case. The cases are mainly about different traffic measures, where implementation has failed due to lack of openness in the decision and implementation procedures.

As a result of his research Flyvbjerg suggested a number of measures to overcome these problems. These measures were:

- a) Many involved: form a planning board. Central stakeholders are invited to join the decision process already from the beginning.

- b) Public hearings: use public hearings before, under and after implementation. This is to early get to know the stakeholders for the suggested measures.
- c) Free information to avoid lobbying. All information about the suggested measures ought to be free. For example all information from the planning board can be accessible for public and media.
- d) Ombudsman as a watchdog. An ombudsman could be an authority where the public can complain.
- e) Independent expertise. Experts could be used to evaluate the foundation for analysis, technical procedures, models used etc.
- f) Court hearings. In special cases of doubtful planning and implementation this could be relevant.
- g) The ethics of democracy. Flyvbjerg also demands us to develop democratic ethics in organisations, and among people involved in environmental projects. This is a long term work that could start by education of present and coming politicians and civil servants.

The consultant Trivector suggested using applicable parts of this list. The results of this were:

Expert group. Consisting of two professors from the Lund University, one in behavioural science, and one in traffic planning. There were also one person from the National Road Authority and one from the Swedish Association of Local Authorities. This group held 3 meetings during the investigation year, and also read all reports and commented on them.

Reference Group. This group held various interest organisations and public institutions such as chamber of commerce, cyclist organisation, road carrier association, industry, police, public transport, schools etc. The group met for 4 meetings during the investigation time.

Public hearings. When the reports were finished in draft, public hearings were held in four different parts of the community.

Transport Commission. The transport commission included the most important politicians and the chief civil servants of planning office and the technical department. At the meetings the consultant and the work group members reported on progress and working process of the LundaMaTs plan proposal. The transport commission held 8 meetings during the process of work.

The minutes from all the meetings were public, and published on the Lund web site.

3.3 The proposal for the LundaMaTs plan

The proposed LundaMats plan consisted of three different parts:

- a study concerning the before situation

- target setting
- an action program with 8 main projects and 83 subprojects.

The plan was presented in three separate documents, in all comprising approximately 300 pages.

The suggested measures consisted of 83 subprojects, organized in 5 main reforms, and 3 supplementary.

The main reforms, with the calculated cost were:

- town planning (2.5 M €)
- better bicycle traffic (13.1 M €)
- better public transport (73.8 M €)
- transport related to business (0.33 M €)
- more sustainable car traffic (14.1 M €)

The additional reforms were:

- information technology (1.6 M €)
- Lund citizen travelling outside Lund (0.1 M €)
- Mobility Management (3.8 M €)

In total cost of the LundaMaTs plan were estimated to 109.3 M €

4. The implementation process

The draft reports on LundaMaTs were finished January 1998. Along with the public hearings, which took place when the draft reports were published, also a traditional referral procedure was undertaken. After this procedure a final version of the LundaMaTs plan were published, late spring 1998.

The municipal council came to a decision to start the work on the suggested measures. This decision was made without any debate in the Municipal Council. This very smooth procedure have been subject to research by one of Bent Flyvbjerg's doctoral students, Carsten Jahn Hansen, in his doctoral thesis, "Local Transport Policy an Planning – the Capacity to Deal with Environmental Issues, 2001.

In his thesis Hansen concludes that:

“a key element in Lund's capacity for policy making and planning for an environmentally adapted transport system has been the establishment of a strong and broadly accepted *discursive hegemony* based on story-lines, that dealt with environmental problems (e.g. CO₂ emissions) as well as possibilities (e.g. long term sustainable development)”.

The discursive hegemony on views of environmental issues was made possible mainly due to the establishment and anchoring of a consensus on stronger environmental goals, strategies, and measures, not only among politicians of different parties, but also among civil servants from different sectors and among a variety of stakeholders”.

Hansen point out the formation and use of the different stakeholder groups had a significant impact on the decision making.

“...Nonetheless, none of the actors was forced into this consensus-building organisation, which did not have any formal competence to make final decisions on objectives, means and funding. The final decision was to be made in the Municipal Council, with the Transport Commission, Work Group, Consultant, Reference Group, Expert Group, and public hearings only as advisory bodies.

However, with leading politicians at the top of the LundaMaTs organisation, i.e. the Transport Commission, it was self-evident that it would have significant importance on the final decisions. Therefore, in practice no one could afford to be outside the organisation, because those actors within would have direct influence on the politicians that in the end would control the decisions of the Municipal Council”.

The conclusion of Hansen show that the use of a broad discussion and anchoring procedure, inspired by Flyvbjerg, has played an important role in that the decision of favouring the whole LundaMaTs plan.

In autumn 1998 the City of Lund selected four main projects to focus on over a three-year period (1999-2001) and began the implementation process. The four selected projects are *the Mobility Centre*, *the Bicycle City*, *Walk and cycle to school* and *the Lundlink (a trunk route bus system)*, which are all part of the comprehensive LundaMaTs.

In 2002-2004 the work with *the Mobility Centre*, *the Bicycle City* and *the Lundlink* continued. To enable work with the LundaMaTs system, the City of Lund applied for and received governmental grants. During 1998-2004 app. €31 million have been invested in different measures within LundaMaTs.

The measures that have been carried out within the frame of LundaMaTs are both technical and mobility management in character. Examples of measures are construction of new bike paths, improved school routes, commuting by bike, walking school bus, car sharing associations etc. Another example is the yearly 'In town without my car' event that was organized for the first time on September 22, 2000. An important activity has been the “TravelSmart”-project. This activity reaches people in their own homes and in workplaces, with individual marketing of more sustainable transport modes.

The realisation of LundaMaTs is collaboration between the City of Lund, the business sector, the public transport sector, different associations and

authorities. The City of Lund and the Swedish Department of the Environment are co-financing the implementation. The Technical Services Department and the Planning and Building Department in the City of Lund have chief responsibility for the realisation of LundaMaTs. In 2005 the comprehensive LundaMaTs-plan was revised and further developed into the so-called LundaMaTs2.

The Mobility Centre, which was one of the first of its kind in Sweden, was a part of the EU-project MOST in 2000-2002.

Since 1999 Lund have been working with the implementation of LundaMaTs. During 1998-2004 app. €31 million have been invested in different measures within LundaMaTs. The measures are both physical measures, and mobility management measures.

5. The results after some years of work

Both in 2001 and 2004 Trivector Traffic has been assigned to evaluate LundaMaTs in cooperation with the Mobility Centre. This means that there are results from two evaluations with similar focus.

5.1 Purpose

The purpose of the evaluations was to investigate how aware the inhabitants in the City of Lund are of the different projects that have been conducted over the last years, and how the inhabitants have been affected by them.

The activities that have been carried out in LundaMaTs have varied in size and intensity. In order to investigate the awareness and the effects of LundaMaTs in different areas in the City of Lund the evaluation study focused on the town Lund, and the small villages Soedra Sandby, Dalby, Genarp and Veberoed.

5.2 Realisation

The evaluation 2004 included a questionnaire to 4000 inhabitants of age 18-70 years in Lund municipality. In total 59 % of the questionnaires were answered. In the questionnaire we have used the monitoring and evaluation method recommended in the MOST project (EU-project, 2000-2002) which means that the questions are on different levels: from knowledge level to individual behaviour level and system impact level. The model have since then been further by Trivector and is now called SUMO – System for evaluation of Mobility projects. This model is now available in English.

In order to see if there are any differences between the people who did and did not answer the questionnaire, telephone interviews were made with about 50 randomly chosen persons who had not answered the questionnaire. In general there are very small differences between the two groups. In those cases where a difference has been noticed, it has been taken into consideration in the analysis of the questionnaire.

5.3 Effects on behaviour

The majority of people living in the City of Lund are aware of the work with LundaMaTs and the projects and activities involved. The measures have also affected the way the inhabitants travel.

In 2001 *one of ten* inhabitants had decreased their use of the car or started to think about the alternatives to the car. In 2004 this figure had increased to *two of ten* inhabitants. In more detail we can see that in 2004:

- 2 percent have to a large extent switched from car to bicycle and public transport
- 2,4 percent have to some extent switched from car to bicycle and public transport
- 4,3 percent sometimes try to take another transport mode than the car
- 3 percent have started thinking of alternatives to the car

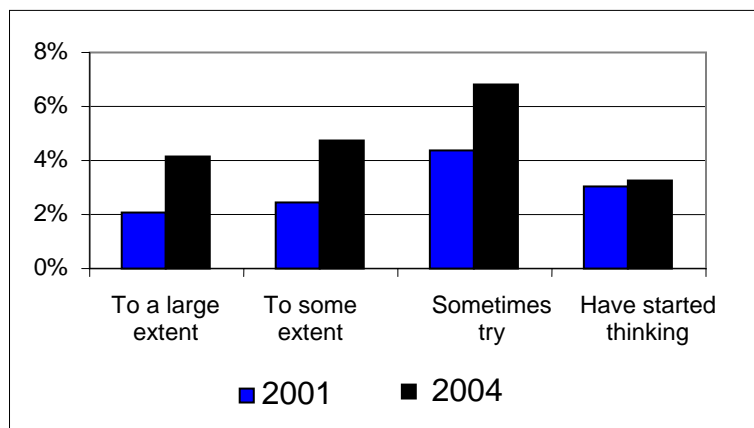


Figure 2 Share of people that have changed their travelling routines because of the activities within LundaMaTs.

The figures above are an average for all inhabitants in the City of Lund, and are somewhat different in Lund and the four studied villages. In total 2004 20% of the inhabitants in Lund have been influenced to change their behaviour.

5.4 Effects on car travel and emissions

Approximately 20 percent of the inhabitants declare that LundaMaTs have influenced them to use their bicycle more, and/or make more use of public transport. A large proportion of the inhabitants have also stated that they have reduced the distance in kilometres that they travel by car during an average week. In the enquiry they were asked to estimate the number of kilometres where they have changed mode.

The total effects are shown in the table below.

Table 1 The impact of the LundaMaTs projects in 2004. (Hyllenius 2006)

	Million km/year	Tonnes CO2/year
Shift from car to bike	5	1300
Shift from car to public transport	5	1000
Car pooling, eco driving, car sharing	0,7	250
Total	10	2500

In 2001 the same figures were about 4 million kilometres and 900 tonnes of carbon dioxide.

The people living in the City of Lund have reduced their car travelling with about 10 million kilometres – or about 2,5-3 % – during the last year compared with a situation without LundaMaTs.

These results can also be seen in the annual traffic countings. The car traffic has been more or less constant during the last years and the use of bikes and public transport has increased. At the same time the population has increased.

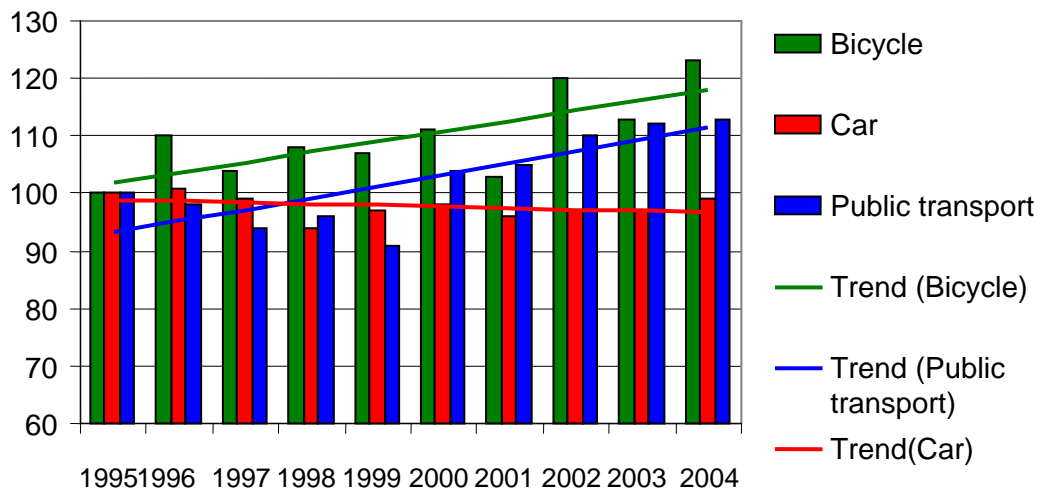


Figure 3: Traffic volumes, index 1995=100. City of Lund 2005

In addition, other measures not investigated in this project can positively contribute towards a even better environment. For example the mixing of ethanol (5 %) in all public petrol stations in the City, replacing travelling with distance work and more efficient goods transports can all help to create a sustainable transportation system in the City of Lund. The total effect is therefore even higher than shown in the table above.

4.3 Additional effects of Mobility Management

The Mobility Centre of Lund is a project office dealing with the implementation of the Mobility Management measures of LundaMaTs. The purpose of the Mobility Centre is to run out-going activities of different kinds. An important activity since 2002 has been the “TravelSmart”-project. This activity reaches people in their own homes and in workplaces, with individual marketing of more sustainable transport modes.

In 2002-2004 approximately 20,000 households in Lund, more than one third of all the households, have received written information about how they can choose the best communication or travel modes in different situations. 12,000 of these households have also received a personal visit or a telephone call from the Mobility Centre. There is a significant difference in effects between those who received a personal visit or call and those who did not. The “TravelSmart”-activities directed to companies have been concentrated to companies nearby the Lundalink.

The individual marketing consists of questions about the current travel modes when commuting and for trips made during leisure time, information about different travel modes and possibilities to test commuting by bike during one year or by public transport during one month. Test periods such as Health Bikers and Bus Riders have been very successful and the long term effects are promising.

6. Discussion

The results from Lund shown in this article seems to point in the direction of that there are possibilities of implementing SUTP:s in a way that can give substantial effects.

The use of research results in making the plan, making the plan accepted and when implementing the measures seems to have had an important impact on the results.

LundaMaTs covers a large variety of tools to establish an environmentally adapted transportation system in the City of Lund. The project consists of a large number of measures, both physical and

mobility management in character. The evaluation shows that the soft measures are of the same, or even higher, importance as the physical measures regarding the effects.

It seems like most people in the City of Lund are satisfied with what has been done within LundaMaTs. This does not only shown by the answers in the questionnaire, but also by the response received regarding the different subprojects. About 20 percent of the inhabitants have altered their travelling behaviour in a positive direction thanks to the activities and more than 90 percent state that the investments in sustainable transports are good.

It is highly plausible that a even more adapted implementation process, based on research results on implementation, could give even better results. The research project IMPACT, a part of TransportMistra, will in the next years produce such knowledge.

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